

5TH BIENNIAL INTERNATIONAL CONFERENCE

ISCSGCON 2023, NAGPUR



**PROCEEDINGS
& ABSTRACTS**

**TRANSLATING
REGENERATIVE
MEDICINE FROM
BENCH TO BEDSIDE**

**DATTA MEGHE INSTITUTE
OF HIGHER EDUCATION
AND RESEARCH**

**ABSTRACTS
23RD-25TH FEB
DMMC, NAGPUR**

WWW.ISCSGCON2023.COM

Preamble

I am thrilled to introduce this e book on Regenerative Medicine and Recent Advances, which offers an in-depth look at the latest developments in this rapidly evolving field. Regenerative medicine is a rapidly growing area of research that aims to repair, replace, or regenerate damaged tissues and organs. This exciting field has the potential to revolutionize healthcare, offering hope to millions of people suffering from a range of diseases and injuries.

This book is a comprehensive overview of the field, Abstract covering the latest advances in stem cell research, tissue engineering, and gene therapy which was presented at ISCSG Biennial 5th International Conference that held at the Datta Meghe Medical College (DMMC), Nagpur on 23rd to 25th Feb 2023. The theme of the Conference was “Translating Regenerative Medicine from Bench to Bedside”.

The abstract is written by leading experts in the field who provide a detailed look at the cutting-edge technologies and techniques used in regenerative medicine

In the first part of the book, the authors explore the biology of stem cells, including their properties and potential applications in regenerative medicine, to the use of injectable biologics to provide faster and better healing for musculoskeletal lesions and conditions. The second part focuses on basic sciences, bio-engineering and tissue engineering, where the authors provide a detailed look at the development of synthetic tissues and organs. The final part of the book covers the exciting area of gene therapy, where researchers are using gene editing techniques to modify cells in order to treat diseases, current treatment methods applied to specific joints and pathologies – ranging from tendinopathies through non-unions to articular degenerative processes , Gynaecology, IVF and andrology , Cosmetology and anti aging

As the editor of this book, I am proud to present this comprehensive guide to the latest advances in regenerative medicine. I am confident that this book will be a valuable resource for researchers, healthcare professionals, and anyone interested in the field of regenerative medicine. I hope you find this book informative and inspiring and that it encourages you to join us in the quest to revolutionize healthcare through regenerative medicine.

Appealing to a broad readership, this E-book will be of interest to both laboratory , research scientists and clinicians, including orthopaedists, sports physicians, physiatrists, and regenerative medicine experts.

Sincerely,
Prof. Dr Naresh Kumar Dhaniwala
Dr Ankit M. Jaiswal



Dr. Vedprakash Mishra
Pro-Chancellor
Datta Meghe Institute of Higher Education & Research
(Deemed to be University)

MESSAGE

It gives me immense pleasure and satisfaction to note that ‘**ISCSGACON-2023**’ 5th **Biennial International Conference** is being organized by Datta Meghe Medical College, under the aegis of Indian Stem Cell Study Group and Centre of Translation Sciences, Datta Meghe Institute of Higher Education & Research, Sawangi (Meghe) Wardha on 24th & 25th February, 2023 on the theme “**Translating Regenerative Medicine from Bench to Bedside**” for which in all humility I extend my heartfelt compliments and congratulations.

Indeed, it is a laudable initiative and a notable venture that has been undertaken with subtle aim and focused purpose. It is also heartening to note that an E-book of the abstracts of the conference is being brought out as a mark of commemoration of the same, which by itself is a significant and a meaningful effort.

The theme chosen for the conference is very timely, apt, relevant and consequential as well. It is also heartening to note that the conference would be attended by delegates and the faculties from the various health sciences Universities participating across the Globe from the United States of America, Europe and Japan.

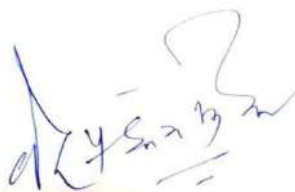
It would be an event which would not only be worthwhile for the purposes of evoking creative discussion on the relevant themes that have been chosen but also would venture in evolving meaningful and commensurate strategies towards the realistic mitigation of the contemporary and long-term concerns and challenges confronting men and mankind independent of geographical boundaries in the domain of healthcare delivery system on the touch tones of ‘Accessibility, Availability and ‘Affordability’.

It is only those who have committed valor at their disposal they alone confront with concerns and challenges and generate commensurate remedial answers to them. It is in this way that milestones are generated which stand out as beacon’s light in their own way and continue to inspire and guide posterity.

Let this conference be a benchmark which is much desired as of now in the chosen arena of indulgence to fulfill the legitimate expectations out of it for all there levant stake holders across the Globe

I sincerely compliment the organizing team for their strenuous effort out of their meticulous plan which would really get unfolded in due course of time in making the scheduled conference a unique success which would be enviable for all the subsequent times.

I wish the organizers and the conference a valiant success.



**Professor of Excellence, Professor of
Eminence, Professor Emeritus and
Distinguished Professor**

Dr. Vedprakash Mishra

Dr. B. C. Roy National Awardee,

**D.Sc.(Honoris Causa) by Seven
Universities**

National Head of the Academic Programme of Indian Programme UNESCO Chair in Bio-Ethics Haifa &
Member of the International Committee for Bioethics for Asia Pacific Region
Chief Advisor to Hon'ble Chancellor and Krishna Institute of Medical Sciences (Deemed to be University),
Karad Pro-Chancellor, Datta Meghe Institute of Higher Education and Research (Deemed to be
University), Nagpur Advisor, Human Ethics Committees Association (HECA), Bangalore
Dean, Academic and Accreditation Board, National Indian Medical Association,
New Delhi Honorary Professor, Indian Medical Association
Honorary Director, Centre for Health Sciences Education Policy and Planning, DMIHER(DU), Nagpur
Former Vice Chancellor, Datta Meghe Institute of Medical Sciences (Deemed University), Nagpur
Former Chairman, Postgraduate Medical Education Committee, Medical Council of India, New Delhi
Former Chairman, Academic Council, Medical Council of India, New Delhi



Dr. Lalit Waghmare
Vice Chancellor
Datta Meghe Institute of Higher Education & Research
(Deemed to be University)

I am delighted to be a part of ISCSGCON 2023 that brings together researchers, scholars, and practitioners from various fields. This conference has provided an excellent platform to share and exchange ideas, discuss emerging trends, and explore new avenues for research and collaboration in the field of regenerative medicine.

As we gather here today, we are reminded of the critical role that research plays in advancing knowledge and finding solutions to complex problems facing our world. The papers presented in this conference represent the collective effort of scholars from diverse backgrounds, each offering unique perspectives and insights that contribute to our collective knowledge.

I commend all the researchers for their hard work and dedication in preparing their papers and for their commitment to sharing their findings with us. Your contributions will no doubt enrich our understanding of various topics and inspire new avenues of inquiry.

I would like to express my gratitude to the organizing committee for their tireless efforts in putting together this conference. Their hard work and dedication have ensured that we have a fruitful and engaging conference.

Finally, I urge all attendees to take advantage of this conference to network, learn from each other, and establish new collaborations that will contribute to advancing our knowledge and addressing the challenges facing our world.

Thank you, and I wish you all a productive and enjoyable conference.

Sincerely,

Dr. Lalit Waghmare

Message from ISCSG Chairperson's Desk



It gives me immense pleasure to be a part of ISCSG association Cargo team. Our 5th Biennial International congress of Indian stem cell study group association is expected to go a long way in the academic development of stem cell research in our country. Hope that the Doctors and Scientist of India who have already been rendering phenomenal services of highest quality to the nation would be benefited by the intellectual deliberations from the interaction with renowned experts from reputed institutions across the Globe. This opportunity of learning and interaction would be of immense value to boost the scientific enthusiasm among the delegates. This continuous learning has no limit as it updates our knowledge which leads to better human services. I hope that deliberations at the conference would go a long way in the development of expertise and knowledge and further would bring forth the advances in Regenerative science.

Dr (Prof) Manish Khanna

MS FIMSA

Orthopaedic Rheumatologic Surgeon & Regenerative Orthobiologist

Founder Advisor, IORA

Chairperson & Charter President, ISCSG

Prof & Head, Autonomous State Medical College, Ayodhya

Co-Chair, Educational Day Academy SICOT

National Course Chief, Fellowship Orthopaedic Rheumatology

Chair, Fellowship in Interventional Orthobiologics

Editor in Chief, International Journal Ortho Rheum

Editor in chief, Text Book Of Orth Rheum (Jaypee)

Email drmanishkhanna@gmail.com; manishvenus@rediffmail.com



अखिल भारतीय आयुर्विज्ञान संस्थान, रायपुर (छत्तीसगढ़)
All India Institute of Medical Sciences, Raipur

Prof. (Dr.) Alok Chandra Agrawal

M.S., D.N.B., P.hD. (Orthopedics) FAMS.

Dean

Professor and Head

Dept. of Orthopaedics

President, Indian Stem Cell Study Group Association

Honorary Professor, Indian Medical Association

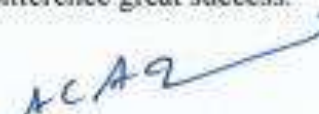
President, Chhattisgarh Chapter of Indian Orthopaedics Association

Convenor, NAMS (Chhattisgarh and Bihar State)



Message

I am very glad to know that the DMIHER under the aegis of the Department Of Orthopedics, Jawaharlal Nehru Medical College, Nagpur and Datta Meghe Medical College, Nagpur along with the Centre of Translational Sciences, is hosting the 5th biennial International Conference of the Indian Stem Cell Study Group Association on 24th and 25th February 2023 at Datta Meghe Medical College, Nagpur. The conference will be consisting more than 100 Guest Lectures, Papers and Posters presentations. It strives to bring together the various delegates, eminent experts and scholars from all over the globe. The Conference will be covering the subspecialties of Orthobiologics, and Gynaecology & Andrology. It strives to bring together the various delegates, eminent experts and scholars from all over the globe. The aim of the event is to provide an opportunity to discuss about the promotion of regenerative medicine, which is predicted to be the biggest game changer for health care. I have been the witness to the efforts put in by the Prof. Sandeep Shrivastava, Organizing Chairman, ISCSGCON - 2023, Nagpur not only to uphill the medical education but to train the undergraduates. I would like to congratulate the whole of the organizing team and wish the conference great success.


Prof. (Dr.) Alok Chandra Agrawal

Message from ISCSG Secretary General



Dear Colleagues and Friends,

Warm Greetings!

ISCSGA is an independent, nonprofit organization that promotes excellence in stem cell science and applications to human health. Our vision is a world where stem cell science is encouraged, ethics are prioritized, and discovery improves understanding and advances human health.

On behalf of ISCSGA, we are honoured to invite you to the ISCSG Biennial 5th International Conference that will take place at the Datta Meghe Medical College (DMMC), Nagpur on 23rd to 25th Feb 2023.

The theme of the Conference is “Translating Regenerative Medicine from Bench to Bedside”.

Stem Cell & Regenerative Medicine is the holy grail of Modern Medicine. Stem cell therapeutics and regenerative medicine have taken a strong foothold in biomedicine. Combinations of these approaches can amplify our natural healing process in the places it is needed most, or take over the function of a permanently damaged organ. Regenerative medicine is a relatively new field that brings together experts in biology, chemistry, computer science, engineering, genetics, medicine, robotics, and other fields to find solutions to some of the most challenging medical problems faced by humankind.

This 5th Biennial International Conference ISCSGCON-2023 “Translating Regenerative Medicine from Bench to Bedside” and preconference workshop will provided an opportunity to reflect on what has been happening in the field of stem cell, to share experiences, perspectives and responses to those challenges in stem cell and regenerative medicine and at the same time to give thought to setting the directions for the future. This conference cum workshop will be significant in that it will be the foremost effort to bring together the experience and expertise of

the more traditional and long established doctors and scientist in the field of stem cell and regenerative medicine.

We request you to participate and to help us make “ISCSGCON-2023” a successful, enriching and memorable event.

Warm regards & best wishes

Dr. Kanchan K Mishra, -PhD -SGPGIMS, India / PDF -TMIN, Tokyo, Japan

Secretary-General, Indian Stem Cell Study Group (ISCSG),

(Deputy Director)

Surat Raktadan Kendra & Research Centre,

(Regional Blood Transfusion & Research Centre)

(NABH Accredited & SIROs recognition from DSIR)

1st Floor, Khatodara Health Centre,

Khatodara – 395002,

Surat (Gujarat), India.

Website: www.srkrc.org

Message the Desk of Organizing Chairman, ISCSGCON 2023



Dear All,
Greetings,

I am pleased to welcome all of you to our gathering. I want to take this opportunity to thank each and every one of you for being here today.

It's exciting to see the advancements in Regenerative Medicine and the potential it holds for healthcare solutions. The development of precision and anti-ageing medicine is a significant milestone in the field, and it's encouraging to see that this conference is contributing to its progress.

It's clear that the 21st century belongs to Biologics, and being a doctor now requires more knowledge and expertise in areas like genomics, cellular therapies, biotechnology, organ transplantations, and genetic engineering. The therapeutics landscape is expanding rapidly, and it's essential to stay up-to-date with the latest advancements and research.

I appreciate the efforts put in by the team from DMIHER to organize this conference, and it's fantastic to see so many scientists, doctors, and industry professionals collaborating to further the field of Regenerative Medicine. I hope this event provides a platform for sharing knowledge and ideas and encourages further research and development in this area.

Overall, this conference is a significant milestone not only for the university, region, and state but also for the nation and the globe. I hope that it's a successful and memorable event for all attendees.

I am confident that the time spent here will be productive and fruitful, and that all of us will leave with new ideas, perspectives, and insights. Our team has put in a lot of effort and dedication to make this event happen, and we are proud of what we have accomplished.

The conference is spanning over three days, with pre-conference workshops to kick off the event. With more than 100 scheduled presentations covering various disciplines, including

basic sciences, eye, ear, orthopaedics, gen. surgery, gynaecology, andrology, oncology, and medicine, attendees will have plenty of opportunities to learn and engage with the latest advancements in Regenerative Medicine.

I'm glad that the conference has attracted many guest faculties, officials, and members of ISCCGA, as well as undergraduate students, who have all shown their enthusiasm and participation in this event. This level of engagement and collaboration is essential for furthering the field of Regenerative Medicine and advancing healthcare solutions. I hope that it exceeds all expectations, leaving attendees feeling informed and inspired by the knowledge and insights gained over the three days.

Please feel free to approach any of our staff members if you have any questions or concerns. We want to ensure that your experience here is both enjoyable and informative.

Thank you again for joining us, and I wish you all the best for the rest of the event.

Dr.Sandeep Shrivastava

MS,DNB (Orthopaedics)

ACME Ph.D (Medical Education)

PGM,MBA. (global Leadership)

Prof.Director (Orthopaedics), JNMC

Chief Scientific Officer (DMIMS)

Mentor - Office for International Affairs

Hon.Dir. Centre for Regenerative Medicine.

Ex,DEAN, JNMC

Ex,CEO, Meghe Group of Hospitals

Datta Meghe Institute of Higher Education and Research (DU), Wardha, INDIA.

Message from Organizing Secretary , ISCSGCON 2023



As a Organizing Secretary of ISCSGCON 2023 , I am writing to inform you of an exciting opportunity to contribute to a abstract e book on the topic of regenerative medicine. Our publication aims to explore the latest advances in the field, including emerging technologies, cutting-edge research, and innovative approaches to clinical practice.

As an esteemed researcher in this field, we believe that your contributions would be a valuable addition to the book. We welcome submissions on a range of topics, including but not limited to:

- Stem cell therapies
- Tissue engineering and biomaterials
- Gene therapy
- Epigenetic regulation of regeneration
- Clinical applications of regenerative medicine

Our goal is to produce a comprehensive and authoritative resource for researchers, clinicians, and students interested in regenerative medicine. The e book will be published by a leading academic press and will be marketed to a global audience.

Thank you for your consideration. We look forward to hearing from you soon.

Best regards,

Dr Aditya Pundkar

Organizing Secretary, ISCSGCON 2023, Nagpur

Associate Professor, Dept of Orthopaedics , AVBRH , Sawangi Meghe, Wardha

Deputy Director of Center of Regenerative Medicine AVBRH , Sawangi Meghe, Wardha

Assisstant Medical Superitendent, AVBRH, Sawangi Meghe, Wardha

Organizing Committee



Dr. Sandeep Shrivastava
Organizing Chairman
ISCSGCON 2023



Dr. Brij Singh
Co-Organizing Chairman
ISCSGCON 2023



Dr. Aditya Pundkar
Organizing Secretary
ISCSGCON 2023



Dr. Vasant Gawande
Co-Organizing Chairman
ISCSGCON 2023



*CA Shrikrishna
Ambarkar*



Dr Aditya Kekatpure



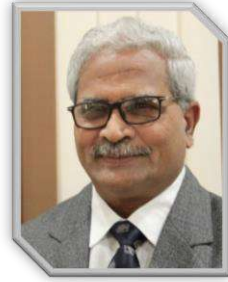
Dr Kunal Saoji



Dr Naresh Dhaniwala



Dr Ratnakar Ambade



Dr Sanjay Deshpande



*Dr Obaid Noman Iqbal
Akhtar*



Dr Swapnil Date



Dr. Mohit Dadlani



Dr Abhiram Awasthi



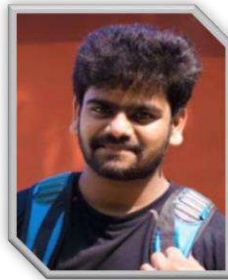
Dr Salahuddin Ahmed



Dr Ankrit Jaiswal



Dr Vivek Jadawala



Dr Rohan Chandanwale



Dr Kashyap Kanani



Dr Suyash Ambatkar



Dr Suhlas Landge



Dr Kuldeep Chhatbar



Dr Vintit Rathod



Dr Milind Gharpinde

Indian Stem Cell Study Group Association



Dr. Alok C. Agrawal
President
ISCSGA



Prof. Manish Khatana
Chairperson
ISCSGA



Dr. Kanchan Mishra
Secretary General
ISCSGA

Program

ISCSGCON 2023-NAGPUR

5th Biennial International Conference

Datta Meghe Institution of Higher Education and Research

23rd, 24th & 25th February, 2023

PRECONFERENCE WORKSHOP (AT HALL C ON 23rd FEB)

Time duration	Topic	Name of Speaker
1 PM onwards	Registration	
SESSION 1	Preparation Techniques for BMAC, SVF and Stem cells	Co-ordinator - Dr. Obaid
1-3 PM	1)Demonstration On Bone Marrow Aspirate Concentrate	Prof. Dr. Manish Khanna Dr. Madhan Jeyaraman
	2)Demonstration On Umbilical Cord derived Stem Cell	Dr. Kanchan Mishra
	3)Demonstration On Adipose derived SVF	Sponsored session by DiponED
	4)Demonstration of Bioinformatics Tools & Analysis With reference to Regenerative Medicine	Dr. Yuvaraj Srinivasan
3-3.15 PM	High Tea	
SESSION 2	Live Demonstration of PRP preparation and Clinical Office Procedures of PRP	
	1)Demonstration On Platelet Rich Plasma Preparation	Dr. Sandeep Shrivastava
3.15-5 PM	2)OA Knee	Dr. Vasant Gawande and Team
	3)Tendinopathies under USG	Dr. Tejas Sadawarte
	4)Wound	
	5)Fracture Video presentation	

Scientific Program

Day 1: Friday 24th February 2023 (Hall A)

Time	Title	Speaker	Chairperson
08.00 to 09.00 am	Registration & Breakfast		
09.00 to 09.45 am	Inauguration Chief Guest: Hon. Dr. Ved Prakash Mishra, Pro Chancellor, DMIHER		
9:00-9:05AM	Lamp lighting and Sarasvati Vandana		
9:05-9:10AM	Floral Welcome		
9:10-9:15AM	Welcome address	Dr. Sandeep Shrivastava	
9:15-9:20AM	Address by Hon. Chairperson and Charter President of ISCSGA	Prof. Dr. Manish Khanna	
9:20-9:25AM	Address by Guest of Honor, Pro. Vice Chancellor, DMIHER	Dr. Gaurav Mishra	
9.25-9.30 AM	Address by Hon. President of ISCSGA	Prof. Dr. Alok Chandra Agrawal	
9.30-9.35 AM	Felicitation of dignitaries		
9.35 – 9.40 AM	Conference Proceeding and Abstract Book Release	Dr. Ved Prakash Mishra	
9.40 – 9.45 AM	Virtual address by Hon. Pro Chancellor, DMIHER	Dr. Kanchan Mishra	
	Vote of Thanks by Hon. Secretary General of ISCSGA		
	National Anthem		

09.45 to 10.30 AM	Session I (8 Min Each)		
1.1 (Guest Lecture)	Assessment (Characterization and Pluripotency) of Long-Term in-vitro Multiplied Human Wharton's Jelly-Derived Mesenchymal Stem Cells (WJ-MSCs) prior to their Use in Clinical Administration	Dr. Kanchan Mishra	Dr Kanchan Mishra Dr B R Singh
1.2 (Guest Lecture)	Differential Immunomodulation of human mesenchymal stem cells from various sources in an inflammation mimetic milieu	Dr. Raja Sundari	
1.3 (Guest Lecture)	Subjective Factors Affecting the Cellular Yield of Progenitor Cells in Bone Marrow Aspiration Concentrate of Iliac Crest – Retrospective Analysis of 63 patients	Dr. Madhan Jeyaraman	
1.4 (Guest Lecture)	Regeneration of Neural Crest Cells from Human Postnatal Multipotent Dental Pulp Stem Cells	Dr. Nikhat Fatima	
1.5 (Guest Lecture)	Genetic insights of Primary Knee Osteoarthritis	Dr. Krishna Subramanyam	
1.6 (Guest Lecture)	Platelet-rich Plasma: What Should We Know?	Dr. Ashim Gupta	
1.7 (Guest Lecture)	Cell and Gene Therapy in the Clinic - hype or hope ?	Dr. Biswa Pratim Das P	
10.30 to 11.30 am	Session II (8 Min Each)		

2.1 (Guest Lecture)	Role of live autologous cultured Osteoblast Concentrate in Sickle Cell Patient with Grade 1 to 3 AVN	Prof. Dr. Alok Chandra Agrawal	Prof. Dr. Alok Chandra Agrawal Dr. Dnyaneshwar Katyarmal
2.2 (Guest Lecture)	Bio-Marker Discovery in Regenerative Medicine	Dr. Yuvaraj Srinivasan	
2.3 (Guest Lecture)	Thematic Trend Mapping & Hotspot Analysis in Bone Marrow Aspirate Concentrate Therapy: A Scientometric Literature Analysis & Advances in Osteoarthritis	Dr. Naveen Jeyaraman	
2.4 (Guest Lecture)	Role of Hormesis in Cartilage Regeneration	Dr. Mahendra Kudchadkar	
2.5 (Guest Lecture)	Developing Regenerative Care For Wound Management.	Dr. Sandeep Shrivastava	
2.6 (Guest Lecture)	The Wonder Tool Platelet Rich Plasma (PRP) in Sensory Neural Hearing loss (Acquired & Congenital)- The Patient Stories	Dr. Vijay Bansod	
2.7 (Guest Lecture)	A study of role of intra-tympanic injection of PRP in treatment of Sensoryneural hearing loss as compared to intra-tympanic injection of Dexamethasone	Dr. Chandraveer Singh	

11.30 to 12.15 pm	Session III (Guest Lecture : 8 Min & Free Paper : 6 Min)		Dr. Gunasagar Das Dr. Ajay Khade
3.1 (Guest Lecture)	Stem cell therapy in ocular surface disorders, our experience	Dr. Gunasagar Das	
3.2 (Guest Lecture)	PRP and combined therapies in Skin Rejuvenation	Dr. Shivani Mane	
3.3 (Guest Lecture)	Stem cells for Liver disease	Dr. Secunda	
3.4 (Guest Lecture)	“Mesenchymal Stem Cells And Its Exosomes As A Targeted Drug Delivery For Cancers” - Literature Review	Dr. Rangappriya Sankaranarayanan	
3.5 (Free Paper)	PRP Pulmonary Rejuvenation as an adjuvant therapy in patients with associated lung disorders.	Dr. Kashyap Kanani	
3.6 (Free Paper)	Platelet rich plasma injection for first carpometacarpal joint osteoarthritis	Dr. Khizar khan	
12.15 to 01.15 pm	Plenary Session		
12.15-12.25 pm	Key note - Regenerative Medicine in India – Our one decade journey	Dr. Manish Khanna	
12.25 to 12.45 pm	Key note - Exploring Renal Regeneration	Dr. Shilpa Sharma	
12.45 to 01.15 pm	Conference Oration - “Science Entrepreneurship: an Insider’s Perspective”	Dr. Mukund Chorghade	
01.15 to 02.00 pm	LUNCH		
02.00 to 03.00 pm	Session IV : Gold Paper Session (6 Min Each)		

4.1 (Free Paper)	Wharton's Jelly derived Mesenchymal Stem Cells (WJ-MSCs) Differentiation into Neural Cell Lineage and association of Suppressor of Cytokine Signalling (SOCS)	Dr. Urvi Panwar	
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	Proteins during Neuronal Differentiation		Dr. Sanjay Deshpande Dr. Manish Khanna Dr. Ashim Gupta
4.2 (Free Paper)	An Experimental Study On Role of PRP As Biological Stimulator for Cartilage Regeneration	Dr. Kuldeep Chhatbar	
4.3 (Free Paper)	Animal model study - Tendon healing by PRP	Dr. Abhiram Awasthi	
4.4 (Free Paper)	Animal model study - Wound healing by PRP	Dr Rohan Chandanwale	
4.5 (Free Paper)	Role of Hysteroscopic Instillation of Platelet-Rich Plasma into the Endo-myometrial Junction in Women with Unexplained Infertility: A Pilot Study	Dr. Sonali Chauhan	
4.6 (Free Paper)	Analysis Of The Effects Of Platelet Rich Plasma Infiltration On Long Bone Regeneration	Dr Ankit Jaiswal	
03.00 to 04.00 pm	Session V : Panel Discussion: Evolving role of Regenerative Medicine Moderator: Dr Sandeep Shrivastava	Panalists: Prof. Dr. Manish Khanna, Prof. Dr. Alok Chandra Agrawal, Dr. Mahendra Kudchadkar, Dr. Sushrut Babhulkar, Dr. Biswa Pratim Das P, Dr. Madhan Jeyaraman, Dr. Kanchan Mishra	
Friday 24th February 2023: (Hall B)			

Time	Title	Moderator
10:30 am to 12.00 pm	Advocacy session on RM, Interaction with faculty	Dr. Subhda Gade Dr. Suvarna Chande
12:00 pm to 1:00pm	Plenary Session at Hall A	
1:00 pm to 2:00pm	Lunch at Canteen (Ground Floor)	
2:00 pm to 4:00 pm	UG session: - Ideation Workshop on RM	Dr. Mukund Chorghade, Dr. Ujwal Gajbe, Dr. Satish Mahajan

08.00 pm Onwards Banquet at Hotel Center Point, Ramdaspath, Nagpur.

Day 2 : Saturday 25th February 2023 (Hall A)

Time	Title	Speaker	Chairperson
08.15 to 09.15 am	Registration & Breakfast		
09.15 to 10.25 am	Session VI (8 Min Each) Virtual Sessions (Coordinator - Dr Aditya Kekatpure/DrBiswa)		
6.1 (Guest Lecture)	Cell free systems in regenerative medicine	Dr. Marco Traub	Dr. Manish Khanna Dr. Abhay Gaidhane
6.2 (Guest Lecture)	Cellular reprogramming using Artificial Genetic switches	Dr. Namasivayam Ganesh	
6.3 (Guest Lecture)	Towards Adult Stem Cell based therapy for Primary Open Angle Glaucoma	Dr. Gowri Priya	
6.4 (Guest Lecture)	Neuronal Cell Culture	Dr. Ashish Khandelwal	
6.5 (Guest Lecture)	CAR-T Cell Therapy	Dr. Rajesh Sharma	
6.6 (Guest Lecture)	Penile regeneration with shockwave therapy	Dr. Thomas Masterson	Dr. Madhan Jeyaraman Dr. Ratnakar Ambade
6.7 (Guest Lecture)	Role of adipose derived stem cell for osteoarthritis of knee and hip joint: Myth or Realty	Dr. Ashok Kumar	
10.25 to 11.15 am	Session VII (Guest Lecture : 8 Min & Free Paper : 6 Min)		
7.1 (Guest Lecture)	Clinical Outcomes of Mechanically Isolated Autologous Adipose tissue-derived Stromal Vascular Fraction (SVF) in Knee Osteoarthritis	Dr. Madhan Jeyaraman	
7.2 (Guest Lecture)	BMAC (Bone Marrow Aspirate Concentrate) in the treatment/management of early Knee Osteoarthritis	Dr. Krishna Subramanyam	
7.3 (Guest Lecture)	Mesenchymal Stem Cell–Derived Exosomes: A Potential Therapeutic Avenue in Knee Osteoarthritis	Dr. Harish V K Ratna	

7.4 (Guest Lecture)	Autologous Adipose Tissue vs Platelet-rich Plasma for Treatment of Knee Osteoarthritis	Dr. Ashim Gupta	
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7.5 (Free Paper)	Does Scaffold-based delivery of Mesenchymal Stromal Cells give Superior results in Knee Osteoarthritis?	Dr. Packkyarathinam R P	
11.15 to 12.00 pm	Session VIII (Guest Lecture : 8 Min & Free Paper : 6 Min)		
8.1 (Guest Lecture)	study on Osteoarthritis of knee evaluating the effects of Biologics with Bio-mechanical correction for Regeneration of Cartilage	Dr. Aditya Pundkar	Dr Aditya Pundkar Dr. Kunal Saoji
8.2 (Guest Lecture)	A Comparative Study of Osteoarthritis Knee Arthroscopy Versus Intra-Articular Platelet Rich Plasma Injection : A Randomised Study	Dr Nikhil Singh	
8.3 (Guest Lecture)	“Nuts in Jelly” technique for medium to large chondral defects of knee – functional outcomes up to 5 years follow up.	Dr. Girinivasan Chellamuthu	
8.4 (Guest Lecture)	FDA approved innovations and applications of stem cell therapy and tissue engineering	Dr. V R Ravi	
8.5 (Free Paper)	Platelet-Rich Plasma Versus Hyaluronic Acid for Knee Osteoarthritis: A regenerative therapy in the field of orthopedics	Dr Rahul Agola	
8.6 (Free Paper)	Utility of platelet rich plasma in rheumatoid arthritis	Dr. Salahuddin Ahmed	
8.7(Free Paper)	An evidence based assessment on the utility of platelet rich plasma in orthopaedics – a literature review	Dr. Vivek Jadawala	
12.00 to 01.00 pm	Session IX (Guest Lecture : 8 Min & Free Paper : 6 Min)		
9.1 (Guest Lecture)	Role of PRP in MCL injuries.	Dr. Vasant Gawande	
9.2 (Guest Lecture)	Arthroscopic Meniscal Repair With Second-Generation Platelet-Rich Fibrin Clot Augmentation	Dr. Arulkumar Nallakumarasamy	
9.3 (Guest Lecture)	PRP assisted Meniscus Repairs	Dr. Swapnil Date	

9.4 (Guest Lecture)	PRP in Rotator cuff Injuries	Dr. Siddhath Jain	Dr Vasant Gawande Dr Pradeep Singh
9.5 (Guest Lecture)	Comparative study on functional outcome of autologous platelet rich plasma injection vs hydrodissection in adhesive capsulitis of shoulder.	Dr. Dushyant Chaudhary	
9.6 (Guest Lecture)	Hand n wrist ,what we can achieve with regenerative therapies	Dr Shashi Pal Sadana	
9.7 (Free Paper)	Comparative Analysis Of The Effectiveness Of Prp Infiltration Versus Intraarticluar Depomedrol In The Treatment Of Adhesive Capsulitis	Dr. Devank Lohiya	
01.00 to 02.00 pm	LUNCH		

02.00 to 03.00 pm	Session X (Guest Lecture : 8 Min & Free Paper : 6 Min)		
10.1 (Guest Lecture)	Is Platelet-Rich Plasma Effective in Enhancing Spinal Fusion? Systematic Overview of Overlapping Meta-Analyses	Dr. Madhan Jeyaraman	Dr. Bishnu Prasad Patro Dr. Samir Dwidmuthe
10.2 (Guest Lecture)	Functional outcomes of lumbar and lumbosacral disc herniation treated with intra discal PRP injection	Dr. Mallikeswaraja Mahendran	
10.3 (Free Paper)	A Comprehensive Review on The Effect of Platelet Rich Plasma In Sacroiliac Joint Pain.	Dr. Ankur Salwan	
10.4 (Guest Lecture)	Autologous Bone Marrow/ Bone glue injection to stimulate bony union in delayed union or non union of long and small bone	Dr. Surya Prakash Sharma	
10.5 (Guest Lecture)	Promising results of cultured osteoblasts in the management of osteonecrosis of femoral head	Dr. Bishnu Prasad Patro	
10.6 (Free Paper)	Role of Orthobiologics in the form of Platelet rich plasma(PRP) in early Avascular Necrosis of Hip	Dr. Mohit Dadlani	
03.00 to 04.00 pm	Session XI (Guest Lecture : 8 Min & Free Paper : 6 Min)		
11.1 (Guest Lecture)	Exploring PRP for Reversal of Gangrene	Dr. Kiran Saoji	
11.2 (Guest Lecture)	To evaluate safety and efficacy of PRP in management of diabetic foot ulcers	Dr. Chandrashekhar Mahakalkar	
11.3 (Guest Lecture)	Use of Platelet growth factor in bone, joint, cartilage and soft tissue in rejuvenation	Dr. Suryakant Hayatnagar	
11.4 (Guest Lecture)	Use of Orthobiologics and Biocomposites in peri prosthetic joint infection and revision arthroplasty	Dr. Sunil Nikose/Dr Nitin Samal	
11.5 (Guest Lecture)	Role of Stem Cells in Lymphatic Regeneration	Dr. K Vishav Murthy	

11.6 (Free Paper)	The Effect Of Locally Infiltrated Platelet-Rich Plasma On Survival Of Skin Flaps In Degloving Injuries	Dr. Suyash Ambatkar	Dr Kiran Saoji Dr N K Saxena
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Saturday 25th February 2023(Hall B)

Time	Title	Speaker	Chairperson
10.00 to 11.00 am	Session XII (Guest Lecture : 8 Min & Free Paper : 6 Min)		
12.1 (Guest Lecture)	Our experience in cell therapy in different surgical problems	Dr. Sribatsa Kumar Mahapatra	Dr. Sushrut Babhulkar Dr. Sanjay Deshpande
12.2 (Guest Lecture)	Regeneration to Degeneration of joints with Chemical and Cellular Regenerative Therapies	Dr. Shashi Pal Sadana	
12.3 (Guest Lecture)	Platelet-rich plasma therapy ensures pain reduction in the management of lateral epicondylitis – a PRISMA-compliant network meta-analysis of randomized controlled trials	Dr. Arulkumar Nallakumara samy	
12.4 (Guest Lecture)	Ultrasound-guided injection of platelet-rich plasma versus corticosteroid for treatment of various tendinopathies	Dr. Suhas Landge	
12.5 (Guest Lecture)	Evaluate The Efficacy Of Autologous Blood Injection Versus Local Corticosteroid (Triamcinolone) Injection In Treatment Of Plantar Fasciitis. A Randomised Controlled Study	Dr. Suryaprakash Sharma	
12.6 (Free Paper)	A Comparative Study Of The Effectiveness Of PRP Infiltration Versus Methylprednisolone In Lateral Epicondylitis Of The Elbow	Dr. Parth Shah	
12.7 (Free Paper)	To assess the effectiveness of PRP vs. Steroid infiltration on functional activity and pain in patients with planter fasciitis	Dr. Shrut Vasavada	
12.8 (Free Paper)	Study on PRP in Plantar Fascitis in Type 2 Diabetes Mellitus patients in double blind placebo Controlled Study	Dr. Ayaz Mir	
12.9 (Free Paper)	Evaluating the Efficacy and Feasibility of utilizing BMMNC in treating Diabetic Osteomyelitis patients	Dr. Aravindhakshan R	

11.00 to 12.00 pm	Session XIII (8 Min Each)		
13.1 (Guest Lecture)	Role of PRP in Obstetrics and Gynaecology	Dr. Deepti Shrivastava	Dr. Deepti Shrivastava Dr. Deepak Juman
13.2 (Guest Lecture)	Erectile Dysfuction 'Regenerative medicine is the answer'	Dr. Deepak Juman	

13.3 (Guest Lecture)	Autologous Human platelet lysate for arteriogenic erectile dysfunction	Dr. Natesh Prabhu	
12.00 to 01.00 pm	Session XIV (6 Min Each)		
14.1 (Free Paper)	Autologous Platelet Rich Plasma-A Revolutionary Therapy In The Field Of Gynaecology	Dr. Tanvi Chaurasia	Dr. Saumitra Inamdar Dr. Pragati Khalatkar
14.2 (Free Paper)	Laposcopic Intra-ovarian instillation of Autologous PRP for ovarian Rejuvenation in Pre-mature Ovarian insufficiency and diminished ovarian reserve	Dr. Shazia Mohammad	
14.3 (Free Paper)	A Comparative Study Between Platelet Rich Plasma And Estrogen For Treatment Of Genito-Urinary Syndrome- A Pilot Study	Dr. Tejal Waghe	
14.4 (Free Paper)	Autologous intrauterine platelet rich plasma versus GCSF instillation for enhancement of endometrial growth and vascularity in IVF Failure.	Dr. Smruti Mapari	
14.5 (Free Paper)	PRPs clinical potential in boosting reproductive outcome in patients with previous implantation failure	Dr. Shrutika Kapare	
14.6 (Free Paper)	Intrauterine PRP instillation in IVF patient for endometrial regeneration.	Dr. Swasti Shukla	
14.7 (Free Paper)	Role of PRP in improving ovarian reserve among women in low AMH	Dr. Prachi Ughade	
14.8 (Free Paper)	Treatment Of Thin Endometrium With Intrauterine Instillation Of Autologous Platelet Rich Plasma: Our Experience	Dr. Sapna Sharma	
01.00 to 02.00 pm	LUNCH		
02.00 to 03.00 pm	Session XV : Poster Presentation (3 Min Each)		

15.1	Beckwith-Weidemann syndrome with congenital heart disease - A poster	Dr. VarshaGajbhiye	
15.2	Allogenic Umbilical Cord-derived Wharton's Jelly for Treatment of Knee Osteoarthritis	Dr. Ashim Gupta	
15.3	Cell-free Stem Cell-derived Exosome-rich Formulation For Regenerative Medicine Applications	Dr. Ashim Gupta	
15.4	Allogenic Amniotic Tissue for Treatment of Knee Osteoarthritis	Dr. Ashim Gupta	
15.5	Rejuvenation Therapy : Role of Platelet Rich Plasma post hysterectomy in post hysterectomy wound dehiscence in hastening wound healing	Dr. Shreya Sahu	

15.6	Role of PRP in treatment of MRSA infected compound tibia fracture	DrPrashanthBalusani	Dr. Devashish Barick Dr. MadhanJeyaraman
15.7	Role of PRP infiltration in diabetic ulcers	DrPrathamesh kale	
15.8	Use of PRP infiltration in bed sores	Dr. Ashutosh lohiya	
15.9	Use of PRP infiltration in crush injury wound of foot	Dr. Siddharth Patel	
15.10	Role of PRP infiltration in post gas gangrene	Dr. Saksham Goyal	
15.11	Role of PRP infiltration in chronic osteomyelitis of calcaneum	Dr. Rahul Singh	
15.12	PRP infiltration in tendinitis	Dr. Sachin Goel	
15.13	Use of PRP infiltration in post operative flap necrosis of radial fracture	Dr. Kevin Kawde	
15.14	Gradual Elastic Suture (Shoelace Technique) Approximation And Platelet-Rich Plasma Infiltration Technique In The Closure Of Open Fracturewound And Infected Wound With Significant Skin Loss : A Case Report	Dr. Anmol Suneja	
15.15	Role Of Platelet Rich Plasma In A Case Of Low Back Pain- A Case Report	Dr. Adarsh Jayasoorya	
15.16	PRP in peripheral arterial diseases	Dr. Simran Dhole	
15.17	Comparison of PRP in diabetic foot ulcer and non-diabetic foot ulcer	Dr. Abhilasha Bhargava	

04.00 to 05.00 pm	Valedictory and Award Function	Dr Kanchan Mishra : Secretary ISCSGA Dr Aditya Pundkar: Org. Secretary ISCSGACON 2023	
		Welcome address	
		Prize Distribution - General ISCSGA	
		Best Free Paper - Orthobiologics	
		Best Free Paper - Gy Andrology	
		Best Short Podium P	
		Best UG Ideation	
		Feedback from Deleg Speakers	
		Address by Chief Gue DMMC, Nagpur	
		Vote of Thanks by Dr Pundkar	
23/02/2023	Executive Body Meeting at 4:00 pm at Council Room, DMMC, Nagpur		
24/02/2023	General Body Meeting at 3:00 pm at Council Room, DMMC,		

	Nagpur		

International faculty



DR MUKUND CHORAGADE
 President of Chorghade Enterprises
 Chief Scientific Officer, THINQ Pharma/THINQ
 Discovery, AGN Biofuels and Empiriko.

DR. MARCO TRAUB
 PHD
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 Cell Therapy Consortium, Switzerland



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 The University of Miami, Miller School of Medicine

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Institute Integrated Cell-Material Sciences (iCeMS), Kyoto
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Visiting Scientist AO Research Institute, Switzerland
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DR ASHISH KHANDELWAL

DR SUNIL NIKOSE

Orthopaedic Surgeon at Tameside and Glossop
Integrated Care NHS FT



DR ASHOK KUMAR

Regenerative Expert (Board Certified/ Diplomate of American Academy of
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MS Ortho (AIIMS), FRSC/Mch Ortho/MRCS (U.K), Diploma in Sports
Medicine (International Olympic Committee)
Fellow Joint Replacement (U.K/Germany) Medicine



Abstracts

Assessment (Characterization and Pluripotency) of Long-Term in-vitro Multiplied Human Wharton's Jelly-Derived Mesenchymal Stem Cells (WJ-MSCs) prior to their Use in Clinical Administration

Dr Kanchan Mishra

Abstract

Assessment (Characterization and Pluripotency) of Long-Term in-vitro Multiplied Human Wharton's Jelly-Derived Mesenchymal Stem Cells (WJ-MSCs) prior to their Use in Clinical Administration

Wharton's Jelly-derived Mesenchymal Stem Cells (WJ-MSCs) are promising candidates for stem cell therapy and regenerative medicine. The quantity MSCs required for a particular therapy demands their subsequent expansion through ex-vivo culture. During in-vitro multiplication, they undergo replicative senescence which may alter their genetic stability. Therefore, this study was aimed to analyze cellular, molecular, and chromosomal alterations in Wharton's jelly-derived MSCs (WJ-MSCs) during their in-vitro sequential passages, where WJ-MSCs were sequentially passaged up to P14 and cells were evaluated at an interval of P2, P6, P10 and P14. They were examined for their morphology, tumorigenicity, surface markers, stemness markers, DNA damage, chromosomal aberration, telomere length and colony-forming unit (CFU) assay. We have processed five full-term delivered human umbilical cord samples to obtain WJ-MSCs, using explant method as alternatives of enzyme digestion in the clinical setup. Cultured WJ-MSCs cells were spindle shaped with plastic adherence capacity. They were efficiently differentiated into Adipocyte, Osteocytes and Chondrocyte lineages. The cell proliferation rate was gradually decreased after the 10th passage. WJ-MSCs have expressed stemness markers OCT-4 and NANOG, while they showed high expression of positive surface markers CD90 and CD105 and lower expression of CD34 and CD45 through flow cytometry and molecular mRNA expression. WJ-MSCs have generated good number of colonies which was assessed by CFU assay. These data indicated that the WJ-MSCs have elevated proliferation capacity, high colony forming efficiency and potency for multi-lineage differentiation. Furthermore they were non-tumorigenic with slow cellular aging during subsequent passages. There was no chromosomal abnormality up to the 14th passage, while increase in comet score and decrease in telomere length were observed in later passages. Hence, our study suggests that

early and middle passaged (less than P10) WJ-MSCs are good candidates for clinical administration for the treatment.

Keywords: Wharton's jelly, Explant culture, Mesenchymal stem/stromal cells, Flow cytometry, Gene expression analysis, Comet assay, Karyotyping, Senescence, Telomere length.

Differential immunomodulation of human Mesenchymal Stem Cells from various sources in an inflammation mimetic milieu

**Raja Sundari Meenakshi Sundaram 1 , Secunda Rupert 1 , Jeswanth Sathyanesan 1 ,
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Aim

Mesenchymal Stem Cells (MSCs) are more advantageous in the field of regenerative medicine due to its immunomodulatory properties. However, these properties varies from source to source. We studied the difference in the immunomodulation in the aspects of response of immune cells to MSCs and vice versa under mitogen stimulated conditions by co-culturing them in-vitro.

Methods

We established the in-vitro co-culture system under mitogen stimulated condition to comprehend the interaction between MSCs and MNCs. We used Fluorescence activated cell sorter (FACS) for studying the immunoregulatory properties and customized PCR array and ELISA for studying the cytokine profile.

Key findings

We observed the differential modulation of immune cells as well as the Mesenchymal Stem Cells in the aspects of immunoregulatory markers and cytokine profile when co-culturing the MNCs from the same source with MSCs from primitive and adult sources under mitogen stimulation. We found some source specific cytokine signature under stimulated co-culture conditions. AT-MSCs showed significant up-regulation in VEGF gene expression, BM-MSCs showed up-regulation of PTGS-2 and down regulation of IL-6 and WJ-MSCs showed increased expression of IDO. This remarkable increase in source-specific upregulation of cytokine gene expression was validated at the functional level by protein expression studies.

Conclusion

AT and BM-MSCs being the autologous source is extensively used for Stem Cell Therapy. WJ-MSCs, though an allogenic source, being a non-invasive source showed better immunomodulatory properties in terms of expansion of T-regulatory cells and cytokine profile at the gene level. This study results highlight that MSCs sourced from different tissues may exhibit unique cytokine signatures and thus may be suitable for specific regenerative applications.

Subjective Factors Affecting the Cellular Yield of Progenitor Cells in Bone Marrow Aspiration Concentrate of Iliac Crest – Retrospective Analysis of 63 patients

Dr. Madhan Jeyaraman

Abstract

Introduction:

We aim to analyze the influence of subjective factors such as age, sex, comorbidities, and procedure-specific variables such as aspiration volume and influencing the cellular yield of progenitor cells in BMAC harvested from the iliac crest.

Materials &

Methods: We performed a retrospective analysis of patients who underwent autologous iliac crest-based bone marrow aspiration concentrate injection therapy for varied indications between Jan 2020 – June 2021. Patient-related factors such as age, sex, and comorbidities, and procedure variables such as aspirate volume were analyzed. The yield of the bone marrow aspiration concentrate was assessed with the mononuclear cell (MNC) count and colony forming unit (CFU) assay from the aspirates. Pearson correlation test was done between the age, aspirate volume, and outcome parameters such as MNC and CFU. We used the chi-square test to analyze the role of sex and comorbidities on cellular yield.

Results:

63 patients with a mean age of 51.33 ± 17.98 years were included in the study. There were 31 males and 32 females in the study population with a mean volume of 67.16 ± 17.312 ml being aspirated from the iliac crest for the preparation of BMAC. The final aspirate had a mean MNC count of $20.16 \pm 15.73 \times 10^6$ cells which yielded a mean of 11 ± 12 CFUs. We noted a significant correlation ($r=0.939$, $p<0.001$) between the MNC count and the CFUs derived out of them. We noted significant negative correlation between age and MNC count ($r=-0.671$, $p<0.001$) and CFUs ($r=-0.688$, $p<0.001$). We did not find the sex to have any significant role in MNC ($p=0.082$) count or CFUs formed ($p=0.348$). The presence of comorbidity significantly reduced the MNC count ($p=0.003$) and CFUs formed ($p=0.005$). The aspiration volume significantly negatively correlated with MNC count ($r=-0.731$, $p<0.001$) and CFUs ($r=-0.618$, $p<0.001$).

Conclusion:

The MNC count and CFUs formed from the BMAC depend on the patient-specific subjective variables such as age, comorbid conditions, and procedure variables such as volume of bone marrow aspirate. The sex of the individual does not alter the MNC count or the CFUs formed from BMAC.

Keywords: BMAC; bone marrow aspiration concentrate; cellular yield; factor analysis

Regeneration of Neural Crest Cells from Human Postnatal Multipotent Dental Pulp Stem Cells

Prof.Dr. Nikhat Fatima. MDS.PhD. Professor and Vice Principal Rama Dental College Hospital and Research Centre

Abstract:

Objective: Globally Neurodegenerative disorders are on rise leading to a demand for nerve cells regeneration. There are many sources of nerve cells, but most of them pose ethical, legal and immunogenicity challenges. Our objective was to identify discarded dental tissues as source for stem cells isolation and their differentiation into neurogenic lineage for regenerative applications

Methods/Analysis: Dental pulp tissues (Both impacted and erupted) were collected from 18-40 years old individuals having proper orthodontic reasons. The long-term in vitro culture of dental pulp stem cells (DPSCs) was established in controlled condition. Population doubling analysis was performed at different passages. DPSCs were further triggered into neurogenic cells under serum free retinoic acid defined supplements. Neurospheres development and neurogenic lineage differentiation was identified.

Findings: More than 80% DPSCs were found to express putative dental stem cell marker CD90. We observed all basic biological characteristics of DPSCs during long-term cultivation up to 20 passages. The diameter distribution of cultured DPSCs was quite stable and was found to be 12-18 μ m in diameter. Highest numbers of neurospheres were found to be at day 14 with ~100 μ m in size. Expression of β tubulin-III revealed highest differentiation (>15%) towards neuronal cells. Novelty/Improvement: The present study demonstrates that DPSCs could be a potential option to make repository of neurogenic cells for regenerative applications.

Keywords: Neural Crest Cells, Neural Lineage Cells, Neurospheres, DPSCs, PDT

Genetic insights of Primary Knee Osteoarthritis

Dr. Krishna Subramanyam

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Dept. of Orthopaedics & Sports Surgery

Yashoda Hospitals ,Hyderabad

Abstract

Introduction:

Knee Osteoarthritis (KOA) is characterised by focal loss of joint articular cartilage, osteophyte formation and sub chondral bone remodelling. Common clinical symptoms include pain, stiffness, limitation of the joint movement and swelling. OA is the most common joint disease worldwide and the knee is the common site involved. Classical risk factors of OA include age, gender, weight, joint injury, trauma. However, family history/Hereditary component is the one of the crucial factors. knee OA is a complex disease with environmental and genetic factors associated with its development and progression.

Hypotheses:

It is classified as primary when no discernible cause is evident and secondary when a triggering factor is apparent. However primary OA possesses significant genetic component. Despite the fact that OA is a late onset advanced age disease the increasing incidence of OA individuals below the age of 55 years and the fact that the several members of the same family are affected suggest a genetic predisposition. Hence, there is a need to identify molecular biomarkers associated with primary early knee osteoarthritis

Methods:

Several Genome wide association studies and candidate gene studies have identified genetic variants involved in the pathogenesis of OA like VDR, MMP, TGF, GDF5, COL11A1 and VEGF. Currently, the majority of genetic association studies on disease risk focused on identifying the individual's effect on single nucleotide polymorphisms (SNPs).

Results:

In the present study, ten gene polymorphisms were studied in Indian population. They are COL21, CRTL1, CRTM, ACE, VDR, GDF5, COG5, CYBA, SREBP2 and TGFβ1 genes which were selected based on their role in cartilage maintenance and bone remodelling. This is the first study in India which looked at the gene polymorphisms. Altogether 100 clinically diagnosed and radiologically confirmed early primary knee OA (KOA) cases and 100 controls with no musculoskeletal diseases, were recruited and molecular analysis was performed by routine PCR - RFLP techniques. Results indicated that COL21, CRTL1, ACE, GDF5, COG5, CYBA, SREBP2 and TGFβ1 gene polymorphisms showed an association with the disease where as CRTM and VDR lack of association.

Conclusion:

These gene polymorphisms can be used as molecular biomarkers for identifying the individuals who are at risk of developing the disease (primary knee osteoarthritis) and these molecular genotypes helps us in planning tailored treatment and management. It also help us to identify individuals who are at risk of developing knee osteoarthritis and preventive measures can be planned accordingly. To the best of our knowledge this is the first study in India which assessed these ten gene polymorphisms with primary early knee osteoarthritis.

Platelet-rich Plasma: What Should We Know?

Dr. Ashim Gupta

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ABSTRACT

Knee Osteoarthritis (OA) is an extremely prevalent joint condition throughout the world. Its pathophysiology is linked with inflammation of the synovial tissue and degeneration of articular cartilage, resulting in pain and decreased function. Current available treatment options have limitations, continually trying to reduce pain as opposed to aiming on the underlying pathology. Recently, there has been a notable growth in the use of biologics, including platelet-rich plasma (PRP), for musculoskeletal regenerative medicine applications. Two factors—platelet count and platelet aggregation—have been indicated to affect the efficacy of PRP. No consensus exists for a standardized concentration of platelets in the PRP, and studies have demonstrated that too low or too high of a platelet count can hinder the efficacy of PRP. In addition, despite much research on preparation and activation methods of PRP, there is insufficient literature on the efficacy of PRP injections according to patient-related variables, such as medications, mental and physical stress levels, blood pressure, smoking status, alcohol consumption, etc. For this presentation, I focused on a standard classification system for the PRP, the PLRA classification (platelet count, leukocyte content, red blood cell count, activation); platelets and white blood cells (WBCs) yield by 6 different commonly used kit systems; and common medications which should be stopped prior to Published studies have demonstrated that 5-10X platelet concentration compared to baseline/whole blood increases the cell proliferation and stem cell recruitment. In addition, WBCs or specific WBC subtypes may be beneficial in specific musculoskeletal conditions. Lastly, aspirin, acetaminophen and non-selective NSAIDs should be considered for suspension, whereas COX-2 selective NSAIDs and statins are not required to be withheld prior to a PRP injection.

Cell & Gene Therapy in the Clinic — hype or hope ?
Biswa Pratim Das Purkayastha
PhD (Molecular & Human Genetics)
Associate Professor (Human Genetics) & Dy Director (CRL-CTS)
DMIHER (DU), Sawangi (M)

Cell therapies have emerged as a promising therapeutic modality with immense potential in management of diverse array of pathological conditions through uniquely powerful modes of action. The therapy encompasses multi-modality approaches, including stem cell- and non-stem cell-based, unicellular and multicellular therapies, with different immunophenotypic profiles, isolation techniques and mechanisms of action. Similar diversity has been observed in their regulatory aspects as well. The ongoing enthusiasm for cell-based therapies derives from the prospect of redirecting innate cellular function to enable safety and efficacy profiles that exceed other, more-established, modalities. Nevertheless, the approach is subjected to numerous challenges limiting their widespread translation and commercialization. These may be overcome through the use of cutting-edge basic research driven by multi-omics approaches, genome and epigenome editing, synthetic biology and the use of biomaterials, supported by appropriate regulatory affairs. The best management of many of the genetic disorders may be achieved through gene therapy precision medicine as the approach offer the prospect of correcting cellular genotype through therapeutic transgene delivery, usually via a viral vector. Majority of the genetic disorders are chronic and disabling in nature leading to permanent impairments posing a huge economical and social burden. So, the need for a cure is the utmost expectation of the affected individuals and their family members as observed in the cases of haemophilia, sickle-cell anaemia, thalassemia, various types of muscular dystrophies, primary immunodeficiency in children, retinitis pigmentosa and lysosomal storage disorders, such as Pompe disease, Gaucher's disease, haemangioma, and cystic fibrosis. Nevertheless, gene therapies face several translational challenges including a lack of control over the localization, distribution and magnitude of transgene expression. There is limiting factor surrounding transgenic payload size of many vectors, and a well-documented inability to support repeated dosing cycles owing to the adaptive immune response. This new age therapeutical approaches are big paradigm steps forward for mankind in the continuous evolving scientific world and so they are expected to overcome all the challenges for bringing forward more benefits to both patients and the caregivers in the near future.

**TITLE: Role of live autologous cultured osteoblast concentrate in Sickle Cell Patients
with Grade 1 to 3 AVN of the femur Head**

AUTHOR : Prof. Dr. Alok Chandra Agrawal

Sickle cell anemia brings about a change in the shape of RBC's from circular to sickle like when there is hypoxia. These sickle cells clog the end arteries and bring end organ damage leading to osteonecrosis of the femoral head in adults with sickle cell trait patients. The femoral head remains spherical in stage 1 to 2 and may be little flattened in stage 3. In these patients who had good joint range of motion we tried to revascularise the femoral head by core decompression and regenerating the defect by live autologous cultured Osteoblast Concentrate which is an acceptable procedure for Grade 1 and 2 Idiopathic AVN of the hips.

12 hips with sickle cell AVN of the femoral head with grade 1 to 3 AVN and with good hip motion were selected for live autologous cultured osteoblast Concentrate implantation following core decompression. The concentrate was certified to be having 48 million osteoblasts in a volume of 4 ml of DMEM transport media and without any antigens of infection. In making this concentrate from bone marrow cold chain and asepsis was maintained throughout the 4-week procedure. The patients were permitted full weight bearing at 3 weeks.

The short term results of the procedure has given comparable results to that of patient with idiopathic AVN of the femoral Heads

Omics Based Biomarker Discovery

Dr Yuvaraj

To improve the efficiency of drug development, we need a whole new generation of biomarkers that are more informative and that can tell developers earlier whether or not their drug may have toxicity or it really may not work at all, and to get that early read on what's going to be successful. And so those biomarkers are ones that have yet to be developed especially in the field of Cancer, Neuro disorders, to name a few. Proteomics, Genomics and Metabolomics are the major Omics used in the biomarker discovery. In this talk we would briefly touch upon all the above platforms and in detail with respect to Proteomics. Proteomics involve the large-scale study of proteins, their structure and physiological role or functions. To discover a biomarker for a disease condition you can call a proteomics approach is taken when large number of protein in a given bio sample are characterised and studies qualitatively / quantitatively in an unbiased way. This was significantly driven by coupling of HPLC technology with Mass spectrometry in the early 1990s. Initial MS-Based proteomics was driven by 1 – Dimensional (D) / 2D Gel electrophoresis (Early 2000s). Later followed by 2D LC MS / MS technology involving in-solution methods Vs gel based methods (Significantly after 2006). A brief experimental set-up for a biomarker discovery with bio specimen will also be discussed.

Autologous Bone Marrow Aspirate Concentrate (BMAC) for Keratocystic Odontogenic Tumour (KCOT) – A Case Report

Dr. Naveen Jeyaraman

ABSTRACT

Introduction: Management of keratocystic odontogenic tumor (KCOT) has always remained a conundrum due to its aggressive behavior, indicating wide resection. Achieving an esthetically and functionally acceptable reconstruction remains a challenge. Herein, we present a novel and less invasive technique for the treatment of KCOT.

Case Report: A 17 year old female presenting with pain in the lower jaw for the past 3 months was diagnosed with a large KCOT extending from 35 to 47 region. CT images revealed buccal and lingual cortical bone erosion. Management was done in two stages: cyst curettage and chemical cauterization, followed by application of Bone Marrow Aspirate Concentrate (BMAC) with a delay of two months, to increase the thickness of eroded cortical bone. On follow-up at one year, ossification of the defect was observed.

Discussion: BMAC is a cocktail of mesenchymal stromal cells, hematopoietic stem cells, fibroblasts, mononuclear cells, macrophages, endothelial cells, progenitor cells, growth factors and cytokines. BMAC cocktail provide an anti-inflammatory, anti-fibrotic, anti-apoptotic, and immunomodulatory environment. Autologous platelet rich plasma provides various growth factors (TGF- β , PDGF, EGF, HGF, NGF, IGF-1) and cytokines. Addition of PRP in BMAC cocktail enhance the regeneration of tissues, where PRP act as a functional regenerative scaffold for cell integration, proliferation, and differentiation that can expedite macroscale musculoskeletal tissue healing.

Conclusion: Autologous BMAC with corticocancellous bone acts as an osteoconductive scaffold capable of regenerating the large bone defect created by the curettage of KCOT.

Keywords: Autologous Bone Marrow Aspirate Concentrate, Keratocystic Odontogenic tumor, Mandibular regeneration

Role of Hormesis in Cartilage Regeneration

Dr. Mahendra Kudchadkar

Hormesis is a term used by toxicologists to refer to a biphasic dose response to an environmental agent characterized by a low dose stimulation or beneficial effect and a high dose inhibitory or toxic effect. In the fields of biology and medicine hormesis is defined as an adaptive response of cells and organisms to a moderate (usually intermittent) stress. Examples include ischemic preconditioning, exercise, dietary energy restriction and exposures to low doses of certain phytochemicals. Recent findings have elucidated the cellular signaling pathways and molecular mechanisms that mediate hormetic responses which typically involve enzymes such as kinases and deacetylases, and transcription factors such as Nrf-2 and NF- κ B. As a result, cells increase their production of cytoprotective and restorative proteins including growth factors, phase 2 and antioxidant enzymes, and protein chaperones. A better understanding of hormesis mechanisms at the cellular and molecular levels is leading to and to novel approaches for the prevention and treatment of many different diseases.

This concept has been extrapolated to see the effect of three lifestyle changes which act as hormetic stressors namely Caloric restriction by intermittent fasting, cold shower and controlled hypoxia by Wim Hoff breathing technique and then evaluate outcomes in clinical ,biochemical and radiological parameters and understand effect on chondrocyte health in mild to moderate Knee osteoarthritis of above hormetic stressors.

**Title: DEVELOPING THE REGENERATIVE CARE FOR WOUND
MANAGEMENT.**

Authors:

Prof. Sandeep Shrivastava, Dr. Priyal Shrivastava

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Presenter Name: Prof. Sandeep Shrivastava

Abstract:

Back Ground & Aim:

The management of wounds is a huge challenge. particularly the complex wounds which are associated with necrosis, infections and tissue losses. They need intense care and substantial cost. These cares include surgical and pharmaceutical interventions associated with risks, side effects and morbidity.

The emergence of Regenerative Care is predicted to change the management of health problems. Inclusions of Stem cells, Mesenchymal Stem cells or Platelet-rich plasma in treatment protocol is bringing the much-desired changes. The problem of complex wound healing can be overcome by this shift in knowledge, developed and based on the regenerative Properties of Platelets.

Methods: This study is a Prospective study of 500 wounds (conducted from 2009 -2021), treated by the STARS (Sandeep's Technique for assisted regeneration of skin) technique. It is an innovative protocol developed by the author, utilizing PRP as monotherapy for the treatment of wounds. It has been developed through animal studies, standardisations of laboratory preparations, clinical case-based studies and needful adoptions, till desirable results were obtained.

Results:

We share the outcomes of such treatment. The STARS therapy protocol has led to the complete healing of wounds including complex ones with complete control of infection, skin regenerations, and Reversal of gangrenous changes in all types of wounds including acute & chronic non-healing such as diabetic, bed sores, and venous ulcers. It is a safe and effective method for treating very complex wounds including gangrenes and necrotising changes of vital structures in complex wounds.

Discussion: The PRP preparation made from autologous small-volume blood is a simple centrifuge process. This fluid contains several growth factors such as VGF, TGF, Insulin-Like, and Epithelial Growth Factors. These have anti-inflammatory, antimicrobial and regenerative properties. If utilized properly it has the potential for being a very effective regenerative care for the treatment of Wounds. The STARS therapy is developed with intention of Utilizing these principles of PRP properties.

Conclusion: Through this study, regenerative care has been developed with PRP as Monotherapy and takes a leading stride in establishing clinical practices, bridging and building solutions for complex wound management. It is the game changer for wound management.

The Wonder Tool Platelet Rich Plasma (PRP) in SNHL (Acquired & Congenital)- The Patient Stories

Dr Vijay Bansod

Introduction:

Deafness or the hearing loss can be partial or total. The WHO definition of “deafness” refers to the complete loss of hearing ability in one or two ears. The cases include in this category will be those having hearing loss more than 90 dB in better ear (profound impairment) or total loss of hearing in both the ears. The WHO definition of “hearing impairment” refers to both complete and partial loss of ability to hear. In India, “hearing handicapped” as defined by the Rehabilitation Council of India Act., 1992, is – hearing impairment of 70 dB and above, in better ear or total loss of hearing in both ears. This law is applicable to only those persons with severe hearing impairment whose hearing loss is 70 dB and above.

Hearing loss is one of the common disabilities in India. The prevalence of this disability is higher in children. The children with sensorineural hearing loss is very common which requires the safe, natural, clinically effective and cost-effective method of treatment.

Methods: The platelet rich plasma (PRP) was instilled intra tympanic in round window without piercing the round window membrane.

Results: It was found that 90% patients had bilateral impairment, and maximum patients were with moderate hearing impairment. The rate of improvement was found to be 82.5% except seven patient who had no improvement post PRP.

Conclusion: In our study, the patients with moderate to profound sensorineural hearing loss were found to have improved hearing after PRP treatment. Further studies with bigger sample size are needed to establish this method as new doorway for improving the childhood hearing.

Keywords: Sensorineural hearing loss, Intratympanic, Platelet rich plasma, Steroid, PTA

Dr Chandraveer Singh – A study of role of intra-tympanic injection of PRP in treatment of Sensoryneural hearing loss as compared to intra-tympanic injection of Dexamethasone

Abstract : Stem cell Therapy in Ocular surface disorders, our experience.

Prof.Dr.Gunasagar Dash,M.S, Dr.PNM Dash , M.Sc. Ph.D.

Stem cells are unspecified cells, that have two defining properties; the ability to differentiate into other cells and the ability to self regenerate. They are present in cord blood, amniotic fluid, innermost layer of placenta, bone marrow, tooth bud of third molar tooth, corneal limbus,conjunctiva,cilliary body and retina.

In this study from 2006 to 2000 ,40 cases of ocular surface disorders were included for prospective therapeutic clinical trial of stem cell therapy from various sources.

The cases were Stevens Johnson syndrome-8 ,Vernal conjunctivitis with schield corneal ulcer-2,Ocular limbal dystrophy-2,Calcareous corneal degeneration-2,Non healing corneal ulcer-4 and Progressive pterygium-22 number of patients.

Amniotic membrane transplantation, Auto and homo limbal stem cell transplantation, cord blood instillation were done. The cases were followed for one year. The results are encouraging, In pterygium cases ,recurrence is nil.

PRP and Combination Therapies in Skin Rejuvenation

Platelet-rich plasma (PRP) has gained popularity in facial aesthetics because of its effective role in skin rejuvenation. PRP, having a higher concentration of platelets, allows for greater release of growth factors, which in turn activates the wound-healing cascade stimulating neoangiogenesis and collagen production. One of the most popular uses for PRP is for facial skin revitalisation in the form of dermal injections and topical application during microneedling. The promising nature of PRP makes it an effective stand-alone or in combination with other anti-aging technologies as a good addition to any practice that deals with skin rejuvenation.

Stem Cells for Liver Disease

Dr. Secunda Rupert

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Liver diseases have become a major global health burden that comprises of broad spectrum of diseases with multiple causes. Their diagnosis and treatment have progressed greatly over the years however their clinical outcomes are still not satisfying. Most liver diseases progress to end-stage liver disease (ESLD), which is characterised by large amounts of matrix deposition that makes it difficult for the liver and its hepatocytes to regenerate. In this scenario, Liver transplantation was the only treatment for the end-stage liver disease. Moreover, the shortage of suitable organs, expensive treatment costs and surgical complications greatly reduced the patient's survival rates. So, need for an effective treatment modality has become imperative.

Cell therapy has become the research hotspot in the field of regenerative medicine. Among the various types of stem cells such as Embryonic stem cells (ESCs), Mesenchymal Stem Cells (MSCs), and Induced pluripotent stem cells (iPSCs), MSCs play an important role in the field of regenerative medicine due to several properties such as paracrine function, immunomodulatory properties, immune suppressive properties, ability to home at the site of injury etc.

Exosomes are membrane-derived nanovesicles (size 40 to 160 nm) released from variety of cells. They serve as vehicles that can transport functional “cargo” through physiological barriers to target cells during several clinical intervention. Also, they are known to be non-tumorigenic, low/non-immunogenic with high biocompatibility. Exosomes derived from Mesenchymal stem cell (MSC) have been reported to play important roles in physiological or biological processes in acute or chronic liver disorders by horizontal transferring of genetic bio information from donor cells to neighboring or distal target cells. They also promote hepatocyte proliferation and repair damaged liver tissue by participating in intercellular communication and regulating signal transduction serving as a new strategy for the treatment of liver diseases cannot heal itself spontaneously, potentially endangering the patient's life. Due to this, the risky total liver transplant was the only choice for treating chronic liver disease. Unfortunately, there are numerous dangers associate

“Mesenchymal Stem Cells And Its Exosomes As A Targeted Drug Delivery For Cancers” - Literature Review

: Dr.Rangappriya Sankaranarayanan

Manipal Institute of Regenerative Medicine, Bengaluru

GUIDED BY : Dr.Ravi , Managing Director, Plasmaart Resto Pvt Ltd

Background :

The development of mesenchymal stem cells (MSCs) as cell-based drug delivery vectors for numerous clinical indications, including cancer, has significant promise. Significant efforts have also been made to exploit the innate ability of MSCs to traffic to sites of inflammation, including those present in cancer, to deliver a variety of therapeutic interventions, including apoptosis-inducing agents, cytotoxic chemotherapy, drug-loaded nanoparticles/microparticles, tumor- or tissue-specific prodrugs, immunomodulatory agents, oncolytic viruses, and anti-angiogenic factors. MSCs are thought to use homing mechanisms similar to leukocytes to migrate toward inflammatory cues emanating from sites of tissue damage including the tumor microenvironment.

Aim:

To analyse the past, present and future scope of MSCs and MSCs derived exosomes as a novel drug delivery system for cancer therapy

Key Words used: Mesenchymal Stemcells , drug delivery, Cancer treatment, MSC derived Exosomes, Extra cellular vesicles

Methods:

Literature search were done in various popular search engines like google scholar, pub med, Wiley etc with the above mentioned keywords and about 636 articles were listed. After removing the duplicates and using the inclusion and exclusion criteria , 15 articles were chosen for the literature review study. Inclusion Criteria: Time line 2018-2022, Full text articles, MSCs and MSCs derived exosomes , nanoparticles. Exclusion Criteria: Other cell therapies, articles before 2018, drug therapies other than cancer.

Conclusion:

Tumor development and response to therapy depends not only on tumor cells, but also on different cell types which form the stroma and microenvironment. These include immune cells, vascular endothelial cells and tumor-associated stromal cells such as TAF and MSCs. Due to tropism to the tumor microenvironment, MSCs can be considered as promising vectors for the delivery of antitumor agents. As extracellular vesicles from MSC, exosomes are shown the most similarity of the beneficial and detrimental effects of the cells of origin, they can be carriers to transfer many kinds of molecules from MSC to recipient cells, and then activate a series of effects in cancer cell, which is the major way to suppress or support cancer development. However, despite increasing evidence for the therapeutic efficacy of MSC-derived exosomes, in the future study, it is hopeful to delve deeper into the potential of MSC-exosomes among cancer cells and provide effective treatments with the highest safety.

Kashyap Abstract

**Dr Khizar Khan – Platelet rich plasma injection for first carpometacarpal joint
osteoarthritis**

Wharton's Jelly derived Mesenchymal Stem Cells (WJ-MSCs) Differentiation into Neural Cell Lineage and association of Suppressor of Cytokine Signalling (SOCS) Proteins during Neuronal Differentiation.

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ABSTRACT:

Background: Many of growth factors and inducers have helped to differentiate human Wharton's jelly derived mesenchymal stem cells (hWJ-MSCs) into neurons and glial cells. Recent studies have suggested that suppressors of cytokine signaling (SOCS) proteins are involved in the regulation of neurogenesis and their expression help in development of neurons and glial cells. Furthermore regeneration remains among the greatest challenges in tissue engineering and regenerative medicine.

Methods: The healthy human umbilical cord (n=10; full term normally delivered) samples were processed to obtain hWJ-MSCs. They were characterized at 3rd passage and induced for neurogenesis using NGF, B-27 supplement and EGF. After 21 days of Incubation, the cells at Day-7, Day-14 and Day-21 were examined for neural marker expression and SOCS expression in comparison to hWJ-MSCs.

Results: On differentiation, hWJ-MSCs have developed neural like structure with long axon and neurite. Although hWJ-MSCs expressed neural markers Nestin, Musashi and GFAP, they were completely negative for β -tubulin III, MAP-2 and O1. However, the differentiated neuronal cells (NCs) have revealed significantly high expression of neural markers Nestin, Musashi, β -tubulin III, MAP2 (neurons); and GFAP and O1 (astrocytes and oligodendrocytes). During differentiation cells were analyzed for mRNA and protein expression of SOCS regulatory proteins where at mRNA level SOCS2 was expressed significantly higher than SOCS1, SOCS3 and SOCS6 genes at Day-14 in NCs. Also the expression of SOCS6 was gradually increased during differentiation. The proteins bands were observed from of all SOCS

proteins whereas SOCS3 has shown change in expression at Day-7 and Day-21 in comparison to Day-14 and hWJ-MSCs.

Conclusion: The study results suggest the neural characteristic of hWJ-MSCs help for easy development of neural progenitor cells. The growth factors and cytokines have influenced differentiation of hWJ-MSCs into neuronal cells. It was observed that the neural differentiation regulating SOCS1, SOCS2, SOCS3 and SOCS6 expression in hWJ-MSCs. Moreover, there was significant change in expression of SOCS during different stages of differentiation. This is first study that has confirmed the involvement of SOCS proteins in generation of neural stem/progenitor cells using human mesenchymal stem cells. Hence, the up-regulation and down-regulation study of these SOCS proteins could be potentially useful in future therapy for treatment of neurodegenerative disorders.

An Experimental Study On Role Of Prp As Biological Stimulator For Cartilage Regeneration

Dr Kuldeep Chhatbar (JR3) , Dr Sanjay Deshpande (Professor) , Dr Sandeep Shrivastava (Professor and Director) , Dept of Orthopaedics , Sawangi(Meghe)

BACKGROUND: Knee pain and Cartilage damages are becoming common entity we see in clinical practice, PRP Therapy has good scope in decreasing the knee pain & has potential to regenerate the articular cartilage. This study will be helpful to check the potential of PRP Therapy in regeneration of articular cartilage and reducing knee pain and will become an evidence to further study the role of PRP in patients also.

AIMS: Role of PRP as biologic stimulator for Cartilage Regeneration in Rabbit Model

OBJECTIVES: The objectives of the study will be to test the efficiency of PRP in terms of

1. Generate and study Histo Pathological Evidences for role of Autologous PRP towards Cartilage regeneration.
2. Testing different protocol for imparting PRP therapy for Cartilage regeneration.

METHODOLOGY: Day 1 damage of cartilage by surgical phenol solution after day 14-21 days start treatment in 4 groups with autologous PRP therapy 3 sessions each in 4 groups. Group A – control knee Group B – every 4th day 3 sessions Group C – every 7th day 3 sessions Group D – on 0,7 and 21 days. Rabbits will be evaluated at 3 months by taking Open Biopsy of cartilage and will be evaluated by Histopathologically for cartilage regeneration.

CONCLUSION : We conclude from our study :

1. PRP injection into damaged cartilage can enhance cartilage regeneration
2. PRP infiltration every 4th day in the cartilage has better outcome than other different protocols of PRP infiltration therapy.

KEYWORDS -PRP , Cartilage , Rabbits , Osteoarthritis

Abhiram Abstract

An Experimental study on the role of platelet-rich plasma for tissue engineering and regeneration of skin on rabbit model.

Dr Rohan Chandanwale

Introduction:

Healing of wounds includes overlapping processes like inflammation, blood clotting, cellular proliferation, and extracellular matrix (ECM) remodelling and is a conserved evolutionary process among species. But there is a difference in the result of wound healing in the skin between species. The application of growth factors stimulates skin regeneration. Local application of growth factors has important therapeutic potential in skin regeneration, although the exact mechanism of action is still not completely understood. Although the use of PRP in the treatment of wounds has been undertaken in the case of humans, especially in long-standing ulcerating-type wounds, there are only a few references pertaining to experimental animal evidence of PRP usage.

AIMS:

To study the role of platelet-rich plasma for tissue engineering and regeneration of the skin in a rabbit model.

OBJECTIVES: The objectives of the study will be to evaluate the role of PRP in terms of 1. Rate of regeneration 2. Quality of skin coverage 3. Development of PRP protocols, particularly in terms of A. Form of PRP: liquid (non-activated) and gel (activated) B. Type: Autologous and homogenous C. Delivery: Infiltration and local application

RESULTS:

In the present study, the results amongst all groups were superior in group C in which PRP infiltration was done every 4th day. The results were significantly better in terms of the rate of wound healing and quality of wound healing.

CONCLUSION:

Based on this study we conclude that there is a definitive role of platelet-rich plasma in tissue engineering and regeneration of the skin. PRP is a safe treatment for the cutaneous wound healing process managing to shorten the recovery period.

TITLE: Role of Hysteroscopic Instillation of Platelet-Rich Plasma into the Endo-myometrial Junction in Women with Unexplained Infertility: A Pilot Study

Dr. Sonali Chauhan

Abstract

Endometrial thickness is important for implantation but in infertility treatments, failure of Embryo transfer is associated with thinned endometrium. Injection of platelet-rich plasma (PRP) into the endo-myometrial junction under hysteroscopy guidance has recently been shown to improve endometrial thickness and vascularity, providing a unique therapeutic strategy for these patients. In this study, 10 patients aged between 25 and 45 years, suffering from primary or secondary infertility, were selected for hysteroscopic instillation of PRP. After PRP instillation, the endometrium was 7 mm or thicker in 7 of 10 patients, and all 7 patients underwent frozen embryo transfer. Moreover, 5 of 10 patients who underwent embryo transfer conceived, whereas 2 had a clinical pregnancy with visualization of cardiac activity at 6 weeks and one had a biochemical pregnancy. We observed an improvement of endometrial thickness and higher pregnancy rates in cases of previously cancelled embryo transfer due to a thin endometrium.

Keywords: Platelet Rich Plasma, Hysteroscopy, Endometrium, Embryo Transfer

Analysis Of The Effects Of Platelet Rich Plasma Infiltration On Long Bone Regeneration

**Dr. Ankit jaiswal⁽¹⁾, Prof Dr. Sandeep Shrivastava⁽²⁾(PROF AND DIRECTOR) , Prof
Dr. Ratnakar Ambade⁽³⁾ (PROF AND HOD), DEPT OF ORTHOPAEDICS, JA
Sawangi, Wardha**

INTRODUCTION :

Platelet rich plasma (PRP) is defined as the autologous accumulation of human platelets in a small plasma volume. PRP demonstrates very high concentrations of platelet-derived growth factors that can promote the formation of bone-forming cells. To cause local osteoprogenitor cells to proliferate and differentiate into bone-forming cells, the use of PRP leads to the mineralization and development of the bone matrix . As it is an autologous preparation, risks such as disease transmission or an immunogenic reaction are not seen in PRP therapy . Numerous attempts for bone healing are: Hyperbaric oxygen exposure, Low intensity pulsed electronic stimulation, tissue engineering, increased distraction rates have resulted in poor bone formation and also complications like severe soft tissue contracture and nerve problems.

OBJECTIVE:

To study the effect of platelet rich plasma infiltration in regeneration of patients undergoing limb reconstruction and lengthening by distraction osteogenesis of long bones.

METHODOLOGY:

We will select 20 patients undergoing limb reconstruction with external fixation through distraction osteogenesis; randomized into 2 groups of 10 each. In the STUDY GROUP all the patients were subjected to PRP infiltration at the regenerate site after stopping of distraction whereas CONTROL GROUP patients will not be subjected to any such intervention. 2 ml of freshly prepared PRP will be infiltrated percutaneously at the regenerate site under C arm guidance using 20 gauge needle under strict asepsis and injected at the regenerate site at an interval of 2 cm on Day0, Day7 and Day14

CONCLUSION-

We conclude from our study :

1. PRP injection into regenerate site can enhance bone healing during distraction osteogenesis.
2. PRP injection at the regenerate site is proposed as one of the biological methods that can effectively decrease treatment time during distraction osteogenesis without the need of hardware modification.

KEYWORDS: PRP, long bone regeneration, distraction osteogenesis

Cell free systems in regenerative medicine

**Dr. Marco Traub , PHD; Trans European Stem Cell Therapy Society, Berne;
Switzerland.**

Meanwhile a significant number of clinical trials for mesenchymal stem cell usage is registered at FDA and EMA. The production and commercialization of mesenchymal stromal cells (MSCs) is strongly regulated. Allogeneic MSCs are displaying a high value for clinical usage compared to autologous MSCs with a wide range of applications. The regulation barriers towards engineered MSCs is high and costly for KMUs. "Engineered cells which have been subject to substantial manipulation, so that biological characteristics physiological functions or structural properties relevant for the intended regeneration, repair or replacement are achieved; is presented as having properties for regenerating or replacing human tissues, the EMA/CAT considers the the product fall within the definition of a tissue engineered product" (Artikel 17-Regulation (EC) No 1394/2007, 2018). So MSCs are to be ATMPs (Advanced Therapy Medicinal Products, (EU) 2017/745, (EU) 2017/746). Cell free systems offering at least for the moment an alternative source for exemption clinical usage (ECU) as well for clinical studies. Extracellular Vesicles (EcVs) are used as drug delivery system. Isolated Exosomes from MSCs are displaying comparable regenerative properties. The therapeutic role of EcVs seems to be significant for neurodegenerative, cardiovascular and orthopedic diseases. More studies on safety and efficacy have to be established to examine the therapeutic role of EcVs for the near future.

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NAMASIVAYAM Ganesh Pandian started his research at the Indian Institute of Technology -Madras and moved to Niigata University with a Japanese Government scholarship to complete his Ph.D. (Biosciences) in 2009. He relocated as a Research Associate at Kyoto University in 2010 after serving as a visiting scientific advisor in the Ushiki patent office. Ganesh is now a tenured Associate Professor (Jr.) and Principal Investigator at Kyoto University Institute for Advanced Study, visiting professor at AO Research Institute (Switzerland), Rutgers University (USA) and a scientific advisor in ReguGene Co. Ltd. For more info, please refer <https://www.namasivayam.icems.kyoto-u.ac.jp>; www.regugene.co.jp

In recent years, the approval of nucleic acid-based therapeutics has increased remarkably, given their demonstrated potential in treating communicable and noncommunicable diseases. Conventional therapeutic approaches are targeted at protein-protein interactions and often result in a transient effect that may vary between patients. In this regard, nucleic acid-based targeted therapeutics are favored because they can achieve a long-lasting effect that is consistent across patients. While modern sequencing techniques accumulate a massive wealth of biological information about the critical genes associated with cellular responses and molecular recognition, there are only fewer tools to precisely control them. Harnessing the chemical biology of nucleic acids, our lab develops artificial genetic switches to artificially control the epigenetic programs that orchestrate the “ON” and “OFF” status of the cell fate genes on demand.¹ We have scripted the targeted differentiation of stem cells into cardiomyocytes² and created biomimetic epigenetic codes for neural genes³. Also, we made MITO-PIP, the first mitochondrial gene switch⁴, and then improved them to achieve the targeted elimination of mutated mitochondrial DNA⁵ inside live cells. We improved cancer immunotherapy by targeted epigenetic induction of mitochondrial biogenesis in the exhausted T cells.⁶ Recently, we decoded telomere dynamics⁷, RNA modifications⁸, and biomolecular interactions⁹. Our future direction is to decode and recode genetic switches at the right place and time and develop targeted transcription therapeutics for precision medicine and cellular reprogramming.

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Towards Adult Stem Cell Based Therapy for Primary Open Angle Glaucoma

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Adult stem cells (SCs) are present in almost every tissue in the body within a unique microenvironment and are responsible for the maintenance of tissue homeostasis throughout life. These SCs remain quiescent and divide when there is a need, to differentiate into tissue/lineage- specific cells. The focus of our research is to understand the biology of the adult ocular SCs – their identification, location, niche or microenvironment, molecular regulation and role in the maintenance of tissue homeostasis. This basic research is essential to characterize the changes in these SCs with ageing and in diseased condition, which is significant to develop better SC-based therapies for ocular conditions including limbal SC deficiency, primary open angle glaucoma, age-related cataract and retinal degenerative diseases.

Trabecular meshwork (TM) is a tiny porous tissue in the eye that drains the aqueous humor from the anterior chamber of the eye. Drastic reduction in TM cells, increased extracellular matrix deposition, increased resistance to aqueous humor outflow have been associated with high intraocular pressure in patients with primary open angle glaucoma. Recent studies from our laboratory established that there is a reduction in the TM-SC content in donor eyes with glaucoma, along with a drastic reduction in the TM cells. Studies using a cell loss glaucomatous human organ cultured anterior segment model indicated that transplantation of cultured TM-SCs aids in restoring the normal intraocular pressure. In addition, the SC-derived exosomes were demonstrated to enhance TM cell proliferation and increase cell viability under oxidative stress *in vitro*, indicating the possibility of establishing a SC-based therapy for glaucoma.

Primary neuronal cell culture for the study of bacosides and lauric acid nano-herb conjugate mediated restoration of neuronal and epigenetic markers in scopolamine model of neurodegeneration

Ashish Kumar

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Primary neuronal cell culture is highly used system in modern neurobiology. The culture is initiated using embryonic stem cells from the specific developing brain region and differentiated for two weeks into mature neurons. Primary neuronal culture system is useful for identification of pathways, disease mechanisms, and testing safety and efficacy of the drug candidates, etc. In the present study, we cultured primary neurones from the embryonic cerebral cortex and treated with the bacosides as well as lauric acid encapsulated lactoferrin-conjugated tri-block PEGPLA-PCL-OH polymersomes, alone and in combination (1:1) on scopolamine challenged neurons, to understand the effect of these compounds. BAN and LAN co-administration showed marked neuroprotection and promoted neurogenesis, neurodifferentiation, neuritogenesis and neurite elongation in mouse neuroblastoma and primary neuronal cells. Cellular changes were accompanied with upregulation of neurotrophic factor BDNF and neuronal activity dependent Arc gene expression. Further investigations into epigenetic changes revealed DNMTs [DNA (cytosine-5)-methyltransferase] and HDACs (Histone deacetylases) inhibition by BAN and LAN combined treatment. Overall, our study showed neuroprotection and neuroenhancement by BAN-LAN combination better than Rivastigmine possibly through epigenetic modification of neuronal genes utilizing primary neuronal culture system.

Dr Rajesh Sharma – CAR-T cell Therapy

Dr Thomas Masterson – Penile regeneration with shockwave therapy

Role of adipose derived stem cell for osteoarthritis of knee and hip joint: Myth or Realty

**Ashok Kumar, Consultant Ortho/Medical Director My Doc Specialist Medical Centre &
Board Certified Regenerative Medicine Experts (AABRM;
Email:akkadamb2004@gmail.com)**

Introduction: Mesenchymal Stem Cell (MSC) therapy in osteoarthritis has been hailed as a promising treatment for osteoarthritis due to their unlimited potential of healing and regeneration. Existing literature regarding their proper name, optimal sources, mechanisms of action, dosage, and route of administration, efficacy, and safety is debatable. **Methods:** Ten patients with 12 joints having symptomatic grade 2-3 (KL) osteoarthritis of hip and knee were included in the study. All the patients received single intra-articular injection of adipose derived culture expanded stem cell (20×10^6) under ultrasound guidance. **Results:** There were 4 female, 8 male; average age was 43 yrs; minimum follow-up was 12 months. All the patient showed improvement in VAS pain and WOMAC score, and quality of life. No serious adverse events were observed. **Conclusions:** The author believes that Maintenance Stem Cells (MSC) may be a more suitable term than mesenchymal stem cell or medicinal signaling cells as their origin might not be limited to mesodermal tissue. Also, they have been shown capable of self-renewal, differentiation, and maintaining a cascade of healing & possibly regeneration at the implanted site. Only a small percentage of implanted MSC survive and rest undergo apoptosis after releasing growth factors, cytokines, and extracellular vesicles. These surviving MSC become active due to conformational changes induced by anti-environment stimuli and undergo limited self-renewal, proliferation, and differentiation, but only a few of them might incorporate into the host tissues. These cells generate & maintain a momentum of series of regenerative activities to improve the function of joint, stabilize or possibly enhance the cartilage quality.

**Is Platelet-Rich Plasma Effective in Enhancing Spinal Fusion? Systematic Overview of
Overlapping Meta-Analyses**

Dr. Madhan Jeyaraman

Abstract

Study Design: Systematic review. **Objectives:** We performed this systematic overview on overlapping meta-analyses that analyzed the role of platelet-rich plasma (PRP) in enhancing spinal fusion and identify which study provides the current best evidence on the topic and generate recommendations for the same. **Materials and Methods:** We conducted independent and duplicate electronic database searches in PubMed, Web of Science, Embase, Cochrane Database of Systematic Reviews, and Database of Abstracts of Reviews of Effects till October-2020 for metaanalyses that analyzed the role of PRP in spinal fusion procedures. Methodological quality assessment was made using Oxford Levels of Evidence, AMSTAR scoring, and AMSTAR 2 grades. We then utilized the Jadad decision algorithm to identify the study with highest quality to represent the current best evidence to generate recommendations. **Results:** 3 meta-analyses fulfilling the eligibility criteria were included. The AMSTAR scores of included studies varied from 5-8 (mean:6.3) and all included studies had critically low reliability in their summary of results due to their methodological flaws according to AMSTAR 2 grades. The current best evidence showed that utilization of PRP was not associated with significant improvement in patient-reported outcomes such as Visual Analog Score for pain compared to the standard fusion procedure. Moreover, PRP was found to be associated with lower fusion rates. **Conclusion:** Based on this systematic overview, the effectiveness of PRP as a biological agent in augmenting spinal fusion is limited. Current evidence does not support the use of PRP as an adjuvant to enhance spinal fusion.

Keywords: Platelet-rich plasma, spinal fusion, systematic review, Jadad algorithm, fusion, meta-analysis

**BMAC (Bone Marrow Aspirate Concentrate) in the
treatment/management of early Knee Osteoarthritis
Dr. Krishna Subramanyam**

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Abstract:

Background: Knee Osteoarthritis (KOA) is a common degenerative joint disease characterized by loss of articular cartilage, osteophyte formation which resulting in disability and affecting the quality of lives. Unfortunately, there is no treatment as on today to reverse the progression of disease. The present available treatments for KOA are palliative. Therefore, there is a need for an alternative treatment modality in the treatment of KOA during the early grades, which should help in not only giving a symptomatic relief but also downturn the disease process. Bone marrow aspirate concentrate (BMAC) has gained a considerable sea change in the management/treatment of KOA in the recent times due to its potential advantages of disease modifying and regeneration capacities. The latest studies on usage of Autologous BMAC injection in KOA showed promising and encouraging results in terms of decrease in the pain, improved knee range of movement, daily activities of living and thus improved expectations for good quality lives.

Aim: The current study aimed to assess the role of single injection- autologous BMAC as a therapeutic option in the treatment of KOA and evaluate the functional and clinical outcome of KL grade II& III patients. One Hundred and thirty-two patients with KOA (KL grade II& III) were included in the study as per the inclusion criteria. Autologous Bone marrow aspiration was done and the separation was done using density gradient centrifugation and final aspirate was injected at the knee joint by Orthopaedic surgeon.

Results: The clinical outcomes of the patients were evaluated at different time points both objectively [Visual Analogue Scale (VAS) & WOMAC (Western Ontario Mac Master Universities Score)] and subjectively (radiographs & MRI) and the follow up was done for a period of one year. At the end of the study period, BMAC therapy showed promising results with encouraging clinical outcome. The application of intraarticular autologous BMAC in Knee osteoarthritis has a huge impact. Compared to the conventional treatment BMAC therapy has more potential with satisfactory, efficient and durable results.

Conclusion: BMAC/mononuclear cells with enriched stem cell therapy can be an alternative therapy with early intervention option with which invasive procedures like knee replacement can be minimized.

Mesenchymal Stem Cell–Derived Exosomes: A Potential Therapeutic Avenue in Knee Osteoarthritis

Dr Harish Ratna

Abstract

Knee osteoarthritis is the leading cause of functional disability in adults. The goals of knee osteoarthritis management are directed toward symptomatic pain relief along with the attainment of the functional quality of life. The treatment strategy ranges from conservative to surgical management with reparative and restorative techniques. The emergence of cell-based therapies has paved the way for the usage of mesenchymal stem cells (MSCs) in cartilage disorders. Currently, global researchers are keen on their research on nanomedicine and targeted drug delivery. MSC-derived exosomes act as a directed therapy to halt the disease progression and to provide a pain-free range of movements with increased quality of cartilage on regeneration. International Society for Extracellular Vesicles and the European Network on Microvesicles and Exosomes in Health and Disease have formed guidelines to foster the use of the growing therapeutic potential of exosomal therapy in osteoarthritis. Although regenerative therapies with MSC are being seen to hold a future in the management of osteoarthritis, extracellular vesicle-based technology holds the key to unlock the potential toward knee preservation and regeneration. The intricate composition and uncertain functioning of exosomes are inquisitive facets warranting further exploration.

Keywords: Mesenchymal stem cells, Exosomes, Microvesicles, Cartilage

Autologous Adipose Tissue vs Platelet-rich Plasma for Treatment of Knee Osteoarthritis

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ABSTRACT

Knee Osteoarthritis (OA) is tremendously widespread joint ailment influencing over 30million individuals in the United States, with anticipated number to reach 67million by 2030. Current treatment modalities have limits, incessantly seeking to lessen pain in place of targeting the underlying pathology. Recently, there has been an increased interest in the use of autologous biologics, including platelet-rich plasma (PRP), adipose tissue, etc., for musculoskeletal regenerative medicine applications. Numerous randomized controlled trials and meta-analyses have shown the safety and efficacy of PRP for treatment of knee OA; and thus, is considered a gold-standard biologic for treatment of musculoskeletal injuries. On the other hand, other autologous treatment modalities such as adipose tissue (including microfragmented adipose tissue (MFAT)) have not undergone similar degree of clinical trials. Moreover, there are limited studies comparing the efficacy of MFAT with PRP. For this presentation, I focused on two recently published prospective randomized controlled trials comparing the safety and efficacy of MFAT with PRP. Results from both these studies indicated that injection of MFAT was not superior to PRP. Interestingly, one study showed that in patients with moderate/severe OA, MFAT showed significantly greater improvement in the International Knee Documentation Committee subjective score compared to PRP at 6 months, but this was not observed at 12 or 24 months follow-up. In conclusion, results from these studies showed that administration of MFAT is safe, similar to PRP, and laid the foundation for multi-center, prospective, randomized, placebo controlled trials to further compare efficacy of autologous adipose tissue/MFAT with PRP.

Does Scaffold-based delivery of Mesenchymal Stromal Cells give Superior results in Knee Osteoarthritis? - Meta-Analysis of Randomized Controlled Trials

Dr. PACKKYARATHINAM .R.P

ABSTRACT:

OBJECTIVES: We aim to analyze and compare the efficacy and safety scaffold-based delivery of Mesenchymal Stromal Cells (MSCs) in the management of osteoarthritis of the knee from Randomized Controlled Trials (RCTs) available in the literature.

MATERIALS AND METHODS: We conducted independent and duplicate electronic database searches including PubMed, Embase, Web of Science, and Cochrane Library till August 2021 for RCTs analyzing the efficacy and safety of scaffold-based delivery of MSCs in the management of knee osteoarthritis. Visual Analog Score (VAS) for Pain, Western Ontario McMaster Universities Osteoarthritis Index (WOMAC), Magnetic Resonance Observation of Cartilage Repair Tissue (MOCART) score, and adverse events were the outcomes analyzed. Analysis was performed in R-platform using OpenMeta [Analyst] software.

RESULTS: 21 studies involving 936 patients were included for analysis. None of the studies made a direct comparison of the direct and scaffold-based delivery of MSCs, hence we pooled the results of all the included studies of both groups and made a comparative analysis of their outcomes. Although at 6 months, both direct and scaffold-based delivery of MSCs showed significantly better VAS improvement ($p=0.002$, $p=0.010$), it was not consistent at 1 year for the scaffold delivery ($p=0.973$). During 6 months and 12 months, direct delivery of MSCs ($p<0.001$, $p<0.001$) outperformed scaffold delivery ($p=0.969$, $p=0.922$) compared to their control based on WOMAC scores respectively. Both direct ($p=0.713$) and scaffold-based delivery ($p=0.123$) of MSCs did not produce significant adverse events compared to their controls.

CONCLUSION: Our analysis of literature showed that direct delivery of MSCs stands superior to currently employed methods of scaffold-based delivery concerning its efficacy measured by improvement in pain, functional outcomes, and safety. Our study urges the development of bio-scaffolds of sufficient nature and quality to improve the clinical efficacy of the MSC therapy.

A study on osteoarthritis of knee evaluating the effect of biologics with biomechanical correction for regeneration of cartilage

Dr Aditya Pundkar

This study aimed to investigate the effects of biologic agents in combination with biomechanical correction on the regeneration of cartilage in patients with osteoarthritis (OA) of the knee. The study involved a randomized controlled trial design with 30 participants with knee OA randomly assigned to either the experimental group receiving biologics with the biomechanical correction or the control group receiving conventional treatment. The experimental group received intra-articular injection of biologics along with biomechanical correction through physical therapy, while the control group received conventional treatment with Proximal femoral Osteotomy. In which we divide 30 patient in three groups.

The study's results indicated that the experimental group had a significantly greater improvement in knee function and pain relief than the control group. In addition, imaging studies showed that the experimental group had greater regeneration of cartilage in the knee joint compared to the control group. The combination of biologics and biomechanical correction may provide a promising approach for the treatment of OA knee, particularly in cases where conventional treatments have failed to provide satisfactory results. These findings suggest that future research should continue to investigate the effectiveness of biologics with biomechanical correction as a potential treatment option for patients with knee OA.

A Comparative Study of Osteoarthritis Knee Arthroscopy Versus Intra-Articular

Platelet Rich Plasma Injection : A Randomised Study

Authors and Co-authors – Dr Nikhil Singh, Dr Vikas Trivedi , Dr N K Mishra, Dr Vipin Kumar, Dr Sharique Ahmad

Abstract

Aims- To compare the clinical results of application of Arthroscopy versus Intraarticular platelet rich plasma injection in patients of osteoarthritis of knee.

Methods- A RCT of 70 patients with grade 2 or 3(Lawrence scale) Osteoarthritis of knee (45 treated with Arthroscopic Microfracture or Arthroscopic lavage and 45 with platelet rich plasma injection) were treated and evaluated at 3,6 and 9 months of follow up. Both the groups were monitored and scored with the Western Ontario and McMaster Universities Arthritis Index(WOMAC) and Visual Analog Pain Scale(VAS).

Results-. Overall, percentage reduction in VAS score at 3 months, 6 months and 9 months was 24.45 ± 9.09 , 18.45 ± 11.60 and $8.29 \pm 14.19\%$ respectively in Group I and 18.96 ± 5.85 , 7.33 ± 8.60 and $3.20 \pm 7.39\%$ respectively in Group II. A statistically significant difference between two groups was observed at 3 and 6 months time intervals only ($p < 0.05$). Overall, percentage reduction in WOMAC score at 3 months, 6 months and 9 months was 24.03 ± 11.41 , 17.45 ± 9.24 and $9.49 \pm 9.80\%$ respectively in Group I and 11.27 ± 5.73 , 5.70 ± 4.78 and $-0.13 \pm 5.06\%$ respectively in Group II. At all the three time intervals, the difference between two groups was significant statistically ($p < 0.001$).

Conclusions

Intraarticular PRP injection is a better treatment modality as compared to arthroscopic debridement and lavage in the management of early osteoarthritis of knee.

It is minimally invasive, reasonable and does not require any anaesthesia or hospital admission as compared to arthroscopy.

“Nuts in Jelly” technique for medium to large chondral defects of knee – functional outcomes up to 5 years follow up.

Dr. Girinivasan Chellamuthu

Abstract:

Background:

In the medium to large chondral lesions particularly in smaller Indian knees, mosaicplasty or Osteochondral fragment fixation is difficult and incomplete because of the limited donor area, requiring advanced staged procedures like autologous chondrocyte implantation and allograft transplantation. In such scenarios, we have developed and used the technique of “Nuts in Jelly” technique.

Methodology:

It is a single-center study. Consecutive patients of age less than 50 years with chondral defect size of more than 2 cm² were operated on with “Nuts in Jelly” technique and followed up. The surgical technique essentially involves filling the defect using cylindrical autografts or remnant osteochondral fragments dispersed in a mixture of fibrin glue with Bone Marrow Aspirate Concentrate just like the nuts dispersed in jelly. The functional outcomes during follow-up were measured with Tegner Lysholm score and MRI at two years of follow-up.

Results:

13 cases were followed up for a minimum of 2 years (5 to 2 years). The average age is 34 years (23 to 46 years). There were 10 males and 3 females. Repeat MRI showed complete healing of lesions at 2 years in all cases. The Tegner Lysholm score was good in 4 patients and excellent in 9 patients.

Conclusion:

Our technique has yielded good to excellent outcomes in midterm follow-up. It is a cost-effective single-stage procedure for the treatment of the medium to large chondral defects of the knee. Further prospective comparison studies are needed to validate the superiority of this technique over chondrocyte implantation techniques.

International conference on innovations and applications in biomedical and health sciences

Dr.V.R.Ravi

FDA approved innovations and applications of stem cell therapy and tissue engineering

Abstract:

India is the leader in stem cell therapy and tissue engineering. The world is witnessing a huge opportunity in healthcare due to the innovations which are really helping the patients. There is a shift of focus from pharmaceutical approach for treating diseases. Regenerative approach to treat the diseases is evolving slowly. From treating only the symptoms and giving replacement therapy like insulin or dopamine, we are now shifting to repairing and regenerating diseased organs. For this to happen stem cell therapy and tissue engineering are helping tremendously. Our Indian government is the first and only government in the world to give FDA approval for stem cell therapy to treat five different diseases. Stem cells can be taken from patients own body from another person and cultured for use. Injecting stem cells can regenerate cartilage, skin, hair, muscles, nerves and other tissues. Wherever there is loss of tissue we can combine stem cells with appropriate scaffold. This combination is called tissue engineering and it can be done inside the body or outside in a lab and then injected into the body. My talk today will be about both stem cell therapy and tissue engineering which are already approved in India and also about diseases for which very soon the approvals are expected because the clinical trials are coming to conclusion in phase 3 studies in various medical hospitals and institutions.

Platelet-Rich Plasma Versus Hyaluronic Acid for Knee Osteoarthritis: A regenerative therapy in the field of orthopedics.

Dr Rahul Agola (JR3) , Dr Nareshkumar Dhaniwala (Professor) , Dr Sandeep Shrivastava (Professor and Director) , Dept of Orthopedics , Sawangi(Meghe)

ABSTRACT

BACKGROUND

One of the numerous recent advancements in the developing field of regenerative medicine is platelet-rich plasma (PRP). Through the local delivery of autologous bioactive substances, it seeks to enhance the process of tissue healing by influencing important physiological mechanisms including inflammation, angiogenesis, or the production of extracellular matrix. Platelet-rich plasma (PRP) and hyaluronic acid (HA) are two nonsurgical treatment options for knee osteoarthritis (OA) that are intended to provide symptomatic relief while postponing surgical intervention. In this review the efficacy and safety of PRP and HA injections for the treatment of knee Osteoarthritis is compared

MATERIALS AND METHODS

This systematic review comprises of articles from PubMed, Cochrane, google scholar, Medline to identify level 1 studies that compared the clinical efficacy of PRP and Hyaluronic acid injections for knee Osteoarthritis. The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), visual analogue scale (VAS) for pain, and Subjective International Knee Documentation Committee (IKDC) scale were used to assess patients.

RESULTS

A total of 24 studies (all level 1) met the inclusion criteria, with 500 patients receiving intra-articular injections of PRP (mean age, 55 years) and 550 patients receiving Hyaluronic acid injections (mean age, 58years). Both groups had a mean follow-up of 10 months. For WOMAC total scores, the PRP group improved significantly more than the HA group (P.01). Six of ten VAS-based studies found that PRP patients had significantly less pain at the most recent follow-up than HA patients (P.05). Based on the Subjective IKDC outcome score, three studies found that PRP patients had significantly higher scores at the most recent follow-up than HA patients (P.05). Finally, leukocyte-poor PRP was associated with significantly higher Subjective IKDC scores than leukocyte-rich PRP.

CONCLUSION

When compared to Hyaluronic acid patients undergoing PRP treatment for knee Osteoarthritis can be expected to have better clinical outcomes. Furthermore, leukocyte-poor PRP may be a better treatment option for knee Osteoarthritis than leukocyte-rich PRP, though more research is needed to directly compare leukocyte content in PRP injections for knee Osteoarthritis treatment.

Keywords: hyaluronic acid; knee; osteoarthritis; platelet-rich plasma.

Utility Of Platelet Rich Plasma In Rheumatoid Arthritis

Dr Salahuddin Ahmed (JR3), Dr Sanjay Deshpande (Professor), Dr Sandeep Shrivastava (Professor and Director), Department of Orthopeadics, sawangi (Meghe)

Introduction

Rheumatoid Arthritis (RA) is a chronic disease characterized by severe inflammation that leads to degradation of articular cartilage and the formation of bony erosions. A patient with RA primarily presents with significant swelling in the wrists, metacarpophalangeal, metatarsophalangeal, and proximal interphalangeal joints. Notably, women are two to three times more likely than men to develop RA over the course of their lifetime. Despite continued advancements in treatment modalities, patients with RA continue to report a significantly diminished quality of life, as the condition interferes with daily physical functioning and productivity.

Therapeutic approaches today primarily consist of disease modifying antirheumatic drugs (DMARDs). These agents have been noted to be key components in managing a patient's RA immediately after the initial diagnosis. However, the most prescribed DMARDs are often not suitable for long-term management due to lack of lasting efficacy, toxicity, expense, and lack of insurance coverage, all of which contribute to discontinuation by patients.

The utilization of platelet-rich plasma (PRP) as a regenerative medicine therapy in many common musculoskeletal pathologies has prompted consideration of its use in patients with RA. The effects of PRP have only been studied in limited trials for the treatment of anterior cruciate ligament tears, Achilles tendinopathy, epicondylitis, plantar fasciitis, cartilage regeneration, arthroplasty, bone healing, augmentation of spinal fusion, rotator cuff repair and osteoarthritis. Additionally, there is even more limited knowledge regarding the efficacy of PRP therapy in patients with RA and its use has not been studied extensively. It has been hypothesized that due to the high concentration of platelets and growth factors, injection of this autologous blood sample may help diminish inflammatory factors, as well as accelerate neovascularization in joints with significant damage from this progressive disease.

Methodology

We present 10 clinical cases in which platelet-rich plasma (PRP) was used for the treatment of RA in patients seeking a new therapy for pain control and improved range of motion, specifically in certain joints of the hand. The Patient Activity Scale II was employed as a standardized method to assess RA disease severity, recorded on the day of injection, at one month, at three months, and at six months. All of the included patients had an established

diagnosis of RA affecting the proximal interphalangeal and metacarpophalangeal joints of the hand.

Conclusion

We conclude from our study:

1. PRP is an effective agent for the management of RA in patients seeking an adjunct or alternative treatment to DMARD therapy.
2. The multitude of these growth factors directly injected into the diseased joint accelerates healing and improves functionality in patients with RA.
3. PRP is likely to be a safe and beneficial therapy in patients with any stage of RA.

Keywords

platelet-rich plasma (prp), rheumatoid arthritis, interphalangeal joint.

**An evidence based assesment on the utility of platelet rich plasma in orthopaedics – a
literature review**

Dr Vivek Jadawala

Abstract

Although the use of platelet-rich plasma (PRP) in orthopaedics has been growing quickly in popularity, its genuine efficacy has not yet been thoroughly proven. Contrary to what many other research claim, some report that injecting PRP directly into the injury site does not significantly improve clinical outcomes. A literature analysis of high-quality evidence on the use of PRP for common orthopaedic problems was carried out due to the inconsistent evidence and several meta-analyses on the topic. According to the evidence so far, PRP might be helpful for people who have lateral epicondylitis or knee osteoarthritis. On the other hand, research on the use of PRP for rotator cuff repair, patellar and Achilles tendinopathies, hamstring injuries, anterior cruciate ligament (ACL) repair, and medial epicondylitis is inconsistent. According to recent research, PRP injections are generally safe and may hasten or enhance the healing of soft tissues. The use of PRP in the treatment of rotator cuff tears, osteoarthritis of the knee, tears of the ulnar collateral ligament, lateral epicondylitis, hamstring injuries, and Achilles tendinopathy is presented in this study as the most recent literature update.

Key words: Platelet-rich plasma, orthopaedics, rotator cuff, knee osteoarthritis, tendinopathies, literature review

Ultrasonography Guided Platelet Rich Plasma (Prp) Infiltration In The Treatment Of Medial Collateral Ligament (Mcl) Tear Of Knee Joint

Vasant Gawande^{1*}, Sandeep Shrivastav², Suvarn Gupta³, Ashwin Chavan⁴, Kunal Saoji⁵

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Abstract

Medial collateral ligament (MCL) injuries are one of the most treated knee pathologies in the world of sports medicine. The MCL serves as the primary restraint to valgus force at both 5° (57.4%) and 25° (78.2%) knee flexion. Conservative care is the standard for Shelbourne Grade 1 and 2 injuries while treatment of Grade 3 injuries remains controversial though good outcomes have been reported with conservative care. The treatment for distal versus proximal MCL injuries does vary based on the extent of the injury, with distal grade 3 often requiring surgery. A general rule of thumb with MCL injury recovery is two weeks off per grade, although it can vary significantly depending on lesion location and treatment progression and the demand of the sport. Platelet-rich plasma (PRP) injections are becoming an increasingly popular adjunct to non-operative treatment protocols. PRP is autologous blood drawn with the intent to concentrate platelet levels higher than physiologic levels, in which, the concentration is typically three to five times higher than the physiologic baseline. Growth factors and other molecules are contained within the alpha granules of platelets that are involved in tissue repair and pain modulation, among other functions. The use of ultrasound to guide the PRP injection allows the physician performing the injection to evaluate the ligament as well as ensure that the PRP is injected within the site of ligament injury. The study was undertaken to study the effect of Platelet Rich plasma injections in the treatment of medial collateral ligament injury. **Material and Methods** The aims and objectives were to study the effect of PRP infiltration in MCL tears of knee joints and to compare PRP-infiltrated cases with standard conservative management. This interventional prospective study was carried out in 40 patients with medial collateral ligament tears presenting to Orthopedic OPD in Jawaharlal Nehru Medical College within the study period of 3 years from January 2017 to January 2020. To assess the outcome, the pain was evaluated using the Visual analogue score (VAS) and function was assessed using the international knee documentation committee (IKDC) and Lysholm knee score. **Observations and Results** Out of 40 patients, a majority i.e., 24 (60%) were males while 16 (40%) were females. The mean age of patients in our study was 41.86 ± 10.51 SD years. IKDC scores were calculated for both groups at pretreatment, one week, one month and three months and were expressed as mean and standard deviation. Both groups showed significant improvement in IKDC scores individually. When compared to each other, the difference in IKDC scores was statistically significant at all the follow-up intervals i.e., one week, one month and three months ($p < 0.05$). Tegner and Lysholm knee scores were calculated as clinical scores, pain points and swelling points for both groups post-treatment at one week, one month and three months and both groups showed improvement in the scores individually. **Conclusion** The use of a single injection of Platelet-rich plasma, when injected to grade I and grade II tears of the medial collateral ligament, helps in faster recovery with satisfactory functional outcome.

Keywords Platelet-rich plasma, Medial collateral ligament injury, Sports Medicine, Conservative management, Regenerative medicine

**Arthroscopic Meniscal Repair With Second-Generation Platelet-Rich Fibrin Clot
Augmentation**

Dr. Arulkumar Nallakumarasamy

Abstract

Meniscal tears are among the most common injuries in the knee, and partial as well as total meniscectomy has been advocated as the treatment for meniscal injury. Over the years, the role of the meniscus as a shock absorber, load transmitter, and secondary anterior stabilizer, along with its proprioceptive and lubrication role, has been well established, and meniscal repair is recommended, especially in younger individuals. Factors such as tear location, pattern, chronicity, size, and extent; repair technique; and patient age and habits can influence meniscal repair, and to enhance meniscal healing, a variety of augmentation techniques have been introduced. These include needling, trephination, synovial abrasion, and the use of adjuvants such as platelet-rich plasma, platelet clots, fibrin clots, bone marrow clots, and stem cells. A second-generation platelet derivative called “platelet-rich fibrin” (PRF) has predictable platelet, growth factor, and cell mediator concentrations without using any anticoagulants. We describe a reproducible and simple way to harvest PRF and create and use a PRF clot, along with detailed instructions on how to integrate the clot with a meniscal repair arthroscopically.

Keywords: Platelet-rich fibrin; Meniscus; Stem cells

Augmentation of Arthroscopic meniscus repair with fibrin clot placement and intra-articular PRP infiltration

Dr. Swapnil Vishwas Date

Introduction: This study was proposed to evaluate the efficacy of fibrin clot placement and intra-articular PRP infiltration in meniscal repair.

Methods: A total of 30 patients with meniscus tears were operated on with arthroscopic meniscus repair, fibrin clot augmentation and intra-articular PRP infiltration. Patients were evaluated preoperatively and postoperatively with clinical criteria, Lysholm knee scoring system.

Results: Clinical improvement was observed in 28 out of 30 patients (93.3%). The mean Lysholm score improved significantly from 62.38 ± 6.55 points preoperatively to 88.39 ± 2.9 points postoperatively ($P < 0.05$) in 6 months follow-up. Paraesthesia in the anterior part of the knee was observed in 2 cases. (6.6%).

Conclusion: We conclude that fibrin clot augmentation is a good cost-effective modality of treatment for repairable meniscus tears to preserve the meniscus which may prevent the early occurrence of osteoarthritis.

Keywords: Fibrin clot augmentation; Meniscus repair; Meniscus tear.

Dr Siddharth Jain – PRP in rotator cuff injuries

Comparative study on functional outcome of autologous platelet rich plasma injection vs hydrodissection in adhesive capsulitis of shoulder.

Dr. Dushyant Chaudhary

Abstract

Background: Adhesive capsulitis of shoulder is also called frozen shoulder which describes a chronic, indolent pathological process in which the body forms excessive adhesions across the glenohumeral joint which in turn leads to pain, stiffness, and loss of range of movements which compromises the quality of life.

Objectives: To evaluate the efficacy and functional outcome of autologous PRP injection and hydrodissection in adhesive capsulitis of shoulder.

Methods: After excluding the patients who failed to satisfy the study protocol, the remaining 100 patients are divided equally into two groups namely group A (n=50) who receive autologous PRP injection and group B (n = 50) who receive hydrodissection for adhesive capsulitis of shoulder. Both group participants are followed up pre-procedurally and post-procedurally at the end of 1st, 6th and 12th month for pain relief and range of movements. The improvements in pain and range of movements are charted in terms of VAS and DASH scoring system.

Results: The statistical analysis was done for 46 patients in group A and 45 patients in group B which showed a statistical improvement in pain and range of movements ($p < 0.001$ for VAS score and $p < 0.01$ for DASH score) in group A who received autologous platelet rich plasma therapy. Autologous PRP therapy improves the functional quality of life with a long term outcome.

Conclusion: For adhesive capsulitis of shoulder, autologous PRP therapy remains functionally superior than hydrodissection as autologous PRP is a constructive procedure by rejuvenating the degenerative tissues.

Keywords – Platelet rich plasma; Hydrodissection; Adhesive capsulitis; Periarthritis

Regeneration to Degeneration of joints with Chemical and Cellular Regenerative Therapies

Dr. Shashi Pal Sadana

Introductio: Management of degenerative joint disorders has always been a tricky and tedious job for Orthopedicians. Most of the time degeneration of ligaments, tendons, capsules, and other supporting soft tissues around the joint leads to the altered biomechanics of the joint and then eventual cartilage degeneration. It has become a clinical necessity to develop novel therapeutic approaches to accelerate the regeneration of these tissues. Objectives; The study aims to investigate the outcomes of 268 patients with unresolved chronic pain in different regions namely: Knee joint, Lower back, Hip joint, Shoulder joint, and Ankle joint. Methods; all of these patients underwent one or a combination of the following regenerative therapies: Chemical Regenerative Therapy, Platelet Rich Plasma Therapy (PRP), and Bone Marrow Aspirate Concentrate (BMAC). On average, 47 months following their last RIT (Regenerative Injection Therapy) session, patients were contacted and asked numerous questions. The questions included, but were not limited to, levels of pain, physical and psychological symptoms, and activities of daily living- before and after their last RIT. Results of this study showed that patients had a statistically significant decline in their levels of pain, stiffness, and crunching sensation. It also showed improvements in their range of motion, with 82% showing improvements in walking ability, medication usage, anxiety, depression, and overall disability. Apart from that, 74% patients showed radiological improvements. Conclusion; In this study, patients with unresolved degenerative joints, treated with RIT, showed reasonably good improvements in many clinically relevant parameters and overall quality of life. Degenerative disorders of joints are not merely referred to cartilage but surrounding soft tissues are also important. Regenerating stabilizing tissue of joints should always be considered in management.

Comparative Analysis Of The Effectiveness Of Prp Infiltration Versus Intraarticular Depomedrol In The Treatment Of Adhesive Capsulitis

Dr Devank Lohiya (Jr3) , Dr Ulhas Dudhekar (Associate Professor) , Dr Sandeep Shrivastava (Professor And Director) , Dept Of Orthopaedics , Sawangi(Meghe)

Introduction:

The most popular view of the pathogenesis of the frozen shoulder syndrome is the concept of a musculotendinous or tenosynovitis-induced inflammation giving rise to the formation of adhesions and capsular thickening. Tendon lesions have been demonstrated or suggested in a large number of works regarding the frozen shoulder. The rotator cuff, biceps tendon, and capsule are most often cited as the structures that set the inflammatory process into motion. Impingement syndrome and resultant subacromial inflammation may play vital roles in the pathogenesis of frozen shoulder syndrome. Altered glenohumeral joint biomechanics often result in impingement of the rotator cuff beneath the acromion, causing pain and inflammation. Concomitant with this tendinitis are synovial hypertrophy and hypervascularity. Platelet Rich Plasma (PRP) is an emerging treatment option and its efficacy needs to be examined and compared with other routine interventions. Platelet-rich plasma (PRP) therapy uses injections of a concentration of a patient's own platelets to accelerate the healing of injured tendons, ligaments, muscles and joints. Some of the key advantages of PRP injections are that they can reduce the need for anti-inflammatories or stronger medications like opioids with no side effects. Recent studies have suggested platelet rich plasma (PRP) to be a safe and effective therapy for periarthritis of shoulder.

Purpose:

To compare the effectiveness of single dose injection of autologous platelet rich plasma vs intraarticular Depomedrol injection in treatment of adhesive capsulitis and to measure the outcome.

Study design:

A total of 40 patients with adhesive capsulitis were treated at Acharya Vinoba Bhave Rural Hospital, April 2021 to September 2022 over 6 months. Patients clinically having symptoms suggestive of Adhesive capsulitis were included for the study. Patients who had received any previous treatment in the form of local injections of steroid & other interventions were excluded from the study. Patients clinically diagnosed to have Adhesive capsulitis in active phase and after excluding all other causes of shoulder pain were subjected to ultrasonographic examination of the shoulder under study to diagnose Adhesive capsulitis. Ultrasonography findings in case of Adhesive capsulitis involves limitation of movement of the supraspinatus is considered a sensitive feature, thickened - 54 - coracohumeral ligament (CHL), echogenic

material around the long head of biceps at rotator interval , increased vascularity of long head of biceps at rotator interval. Randomization and allocation to the trial group were carried out by a lot method. The platelet rich plasma (PRP) was prepared from venous whole blood. After receiving a local anesthetic, all patients had single dose injection of autologous platelet rich plasma or depomedrol injection in their affected shoulder. The primary analysis included visual analog scale (VAS) pain scores, CMS, ROM and restricted ROM.

Conclusion:

Treatment of patients with adhesive capsulitis with PRP reduces pain and increases function significantly. PRP treatment resulted in statistically significant improvements over depomedrol therapy in active as well as passive range of motion of shoulder injection at the end of 12 weeks follow up.

Key words: adhesive capsulitis; platelet; platelet rich plasma (PRP) , depomedrol, tennis elbow.

Is Platelet-Rich Plasma Effective in Enhancing Spinal Fusion? Systematic Overview of Overlapping Meta-Analyses

Dr. Jayaraman Madhan

Abstract

Study Design: Systematic review. **Objectives:** We performed this systematic overview on overlapping meta-analyses that analyzed the role of platelet-rich plasma (PRP) in enhancing spinal fusion and identify which study provides the current best evidence on the topic and generate recommendations for the same. **Materials and Methods:** We conducted independent and duplicate electronic database searches in PubMed, Web of Science, Embase, Cochrane Database of Systematic Reviews, and Database of Abstracts of Reviews of Effects till October-2020 for metaanalyses that analyzed the role of PRP in spinal fusion procedures. Methodological quality assessment was made using Oxford Levels of Evidence, AMSTAR scoring, and AMSTAR 2 grades. We then utilized the Jadad decision algorithm to identify the study with highest quality to represent the current best evidence to generate recommendations. **Results:** 3 meta-analyses fulfilling the eligibility criteria were included. The AMSTAR scores of included studies varied from 5-8 (mean:6.3) and all included studies had critically low reliability in their summary of results due to their methodological flaws according to AMSTAR 2 grades. The current best evidence showed that utilization of PRP was not associated with significant improvement in patient-reported outcomes such as Visual Analog Score for pain compared to the standard fusion procedure. Moreover, PRP was found to be associated with lower fusion rates. **Conclusion:** Based on this systematic overview, the effectiveness of PRP as a biological agent in augmenting spinal fusion is limited. Current evidence does not support the use of PRP as an adjuvant to enhance spinal fusion.

Keywords: Platelet-rich plasma, spinal fusion, systematic review, Jadad algorithm, fusion, meta-analysis

Functional outcomes of lumbar and lumbosacral disc herniation treated with intra discal PRP injection

Dr. Mallikeswaraja Mahendran

ABSTRACT

Background: Degeneration of intervertebral disc is a natural process during which some discs may herniate leading to the development of sciatica or radiating pain. Treatment for disc herniation includes non-operative and operative methods.

OBJECTIVE: To study the radiological and functional outcome of patients with single-level lumbar and lumbosacral disc herniation who were treated using intra discal PRP injection

Material & Methods: This was hospital based prospective study. This study conducted over a period 1 year. All patients who are selected to undergo intra discal PRP injection for lumbar disc prolapse at the Department of Orthopedics. This study consisted a total of 30 patients.

Results: Our study included a group of 30 patients consisting of 17 males and 13 females. A marked improvement in the VAS and ODI score postoperatively was seen. A significant increase in foramen height, segmental angle and disc space was seen post operatively and follow-up.

Conclusion: This study demonstrates and supports the advantages of intra discal PRP injection in the management of patients with acute lumbar and lumbo sacral disc herniations. The patients with greater disc space, foramen height, and segmental lordotic angle had better clinical outcomes in terms of less back and leg pain and better ODI scores and VAS scores.

A Comprehensive Review on The Effect of Platelet-Rich Plasma in Sacroiliac Joint Pain

Authors: Dr Ankur Salwan (JR3), Dr Gajanan L. Pisulkar (Professor), Dr Sandeep Shrivastava (Professor and Director), Department of orthopaedics, Jawaharlal Nehru Medical College, Sawangi, Wardha.

Abstract

Introduction: - Sacroiliac joint is an axial joint with the largest surface area. Anteriorly it is a synovial joint but posteriorly the structures are mainly supported by ligaments and muscles. With high muscular and ligamentous structures, sacroiliac dysfunction is very common. Treatment of the sacroiliac joint is always a challenge faced by physicians. Platelet-rich plasma (PRP) is one of the treatment methods that is used to manage sacroiliac pain. PRP has been defined as a volume of autologous plasma that has a platelet concentration above baseline. In this review, we have discussed the effect of PRP on sacroiliac joint pain as compared to intraarticular steroids.

Methodology: -A total of 250 articles were screened on the database on PubMed, Scopus and Cochrane. We searched the literature using Google Scholar. Comparative studies between PRP and corticosteroids were included in the study. After removing the duplication and the selection criteria, a total of 09 studies fulfilled the criteria and were included in the study. Pain and functional improvement were the outcomes considered at the time of inclusion of the study.

Result: - Each study was independently assessed based on the methodology result and conclusion. Improvement in pain was seen with PRP. When compared with intraarticular steroids PRP has better results. SI joint pain is a leading cause of Low back pain and PRP helps in reducing pain and improving functioning.

Conclusion: -In conclusion, we found out that the literature supports the effectiveness of PRP for sacroiliac joint pain in terms of reducing pain and functional improvement.

Keywords: - Sacroiliac Joint pain, PRP, low back pain, sacroiliac dysfunction.

Autologous Bone Marrow/ Bone glue injection to stimulate bony union in delayed union or non union of long and small bone.

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Dept. Of Orthopedics,

Northern Railway Divisional Hospital Delhi.

Abstract:

Introduction:-This Retrospective study was conducted to review the bony union in delayed and non union of long and small bone treated by percutaneous autologous bone marrow injection at Northern Railway Divisional Hospital, Delhi during the period August 2017 to February 2019. **Material and methods:-** This study was conducted at Northern Railway Divisional Hospital, Delhi from August 2017 to February 2019 who were treated by percutaneous autologous bone marrow injection. A total of 24 patient with delayed and non union (20 delayed + 4 Non union, { 3 hypertrophic and 1 gap nonunion}) of long and small bone were included. **Results:-** Out of 24 patients, 19(79%) were male and 5(21%) were female with an overall mean age of 41 years (range: 19-65 years). There were 18(75%) tibial fractures, 3(12%) had ulna fracture and 1(4%) had humerus, malleoli and clavicle fracture each. Mean time duration between the injury and the procedure was 22 weeks (range: 12-43 weeks). Overall, 18/24(75%) patients showed excellent union, 5/24(21%) fair and one poor result and the mean time of healing was 14 weeks (range: 11-26 weeks) after the procedure. **Conclusion:-** Autologous bone marrow injection is an effective and safe method to enhance healing of delayed union and non union of long and small bone. Thus it is concluded that autologous bone marrow injection successfully stimulates the union in case of delayed and non-union of long and small bone.

Key terms- Autologous bone marrow, Delayed and non union, bone healing.

**Promising results of cultured osteoblasts in the management of osteonecrosis
of femoral head**

Dr Bishnu Prasad Patro

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Abstract

Introduction: There is steep rise in the incidence of osteonecrosis of femoral head (ONFH) following covid infection and steroid therapy. Simultaneously there is paradigm change in the management of ONFH in the last decade from hip arthroplasty to joint preservation. Multimodal approach have been tried from bisphosphonates to cultured osteoblasts in an attempt to preserve the joint. **Materials and methods:** We evaluated the effectiveness of autologous cultured osteoblast in 16 hips with a mean follow up of 18 months. Only Ficat and Arlet stage I and II were included in the study. Aetiologically there were 6 hips with sickle cell disease, 4 with chronic alcoholism, 2 with post body building supplement and 4 following steroid use. Preoperative VAS and Harris hip score was correlated to postoperative period. Weight bearing on the operated hip was avoided for 6 weeks in unilateral affection and 12 weeks in bilateral affection post-surgery. Necrotic bony tissue was almost similar in all the osteonecrotic femoral heads from different aetiology other than significant bleeding from core drilling of femoral head in patients with ONFH from sickle cell disease. **Results:** All the patients had significant pain relief following transplant of cultured osteoblasts, that could be due to sincere avoidance of weight on the operated hip. Pain reappeared with walking following period of non-weight bearing which improved with time. VAS and HSS had significant improvement at 6 months. VAS was 0-1 in 14 hips and 2-3 in 2 hips at 12 months follow up with HSS more than 90 in all the hips at 12 months. Patients can sit cross legged, squat and ride bike/car with ease at 9 to 12 months. Magnetic resonance imaging was not supporting at 12 months correlating to the clinical outcome. Patient satisfaction and functional score with the procedure was encouraging to rely on the treatment modality. **Conclusion:** The outcome of cultured osteoblast can be further documented with a long term follow up. As of now the results are promising and may decrease the rate of hip arthroplasty in patients with early ONFH

Role of Orthobiologics in the form of Platelet rich plasma(PRP) in early Avascular Necrosis of Hip.

DR MOHIT DADLANI

ABSTRACT-

Purpose: AVN is serious condition that commonly develops in young individuals as a result of hip osteoarthritis. As long as structural integrity of subchondral plate is retained in cases with early stages of AVN, joint conserving treatments like core decompression, avascular/vascularized bone graft, & different femur osteotomies can be used. This study aims at evaluating efficacy of PRP in head preservation in early AVN hip. **Material and Methods:** Core decompression was done in 15 patients of group A and Core decompression with PRP infiltration was done in 15 patients of group B and follow up of all patients was done at 3, 6 and 9 months. Subjective (Clinical) evaluation of patients was done at each follow up by serial HHS calculation at 3, 6 and 9 month follow up. Objective (Radiological) calculation was done by X rays (stages) at 3, 6 and 9 month and MRI (stages) at only 9 month follow up. **Observation & Results:** On comparison, it was clear that 9 month post-operative HHS in group B was significantly higher as compared to group A which was statistically significant(p value-0.0013). Similarly X ray and MRI stages were compared which were also significant. **Conclusion:** We can say results of our study are promising and showed PRP injection into core decompression site can enhance viability of femoral head for prolonged period of time and can give an add on benefit for femoral head salvage.

Keywords: avascular necrosis, core decompression, femoral head, platelet rich plasma.

Role Of Orthobiologics In The Form Of PRP According To Stars Therapy In Reversal Of Gangrene

Dr Kiran Saoji

Abstract:

Background: Acute post-traumatic wounds are very complicated injuries and these type of injuries do not heal on their own easily. These usually require multi-specialty management involving Orthopedics, General surgery and plastic surgery. The commonly used treatment of these complex wounds involves removal of all dead tissue with serial surgical debridements in the first stage and then repair of the defect with skin grafts or flaps. So the treatment usually is multi-staged and involves multiple surgical procedures owing to repeated exposure to anesthesia. PRP has emerged as a new modality in wound healing. So this study was performed study to demonstrate the effect of PRP on reversal of gangrenous changes of skin and surrounding soft tissues as well as new vessel formation in cases of acute post-traumatic wounds.

Materials and methods: This study was performed at Acharya Vinoba Bhave Rural Hospital Sawangi, Wardha in between duration July 2019 to May 2020. Our study was a prospective interventional study in which 11 patients coming to emergency department with acute post-traumatic wounds involving extremities treated with serial PRP infiltration according to STARs therapy were included.

Observations and results: 11 patients were included in this study with mean follow up of 27.636 days. The mean age of the patients in our study was 37.818 years. Out of 11 patients 7 were males while 4 were females. All the wounds healed completely with PRP. PRP sessions required for complete healing ranged from 4 to 12 with mean of 6.909. There was no need of any additional procedure for wound healing like serial debridements and skin grafting in any of the patients. Complications like infection, abscess or sinus formation, wound dehiscence were not seen in any of the patients.

Conclusion: In our study it was found that PRP infiltration according to STARs therapy along the margins of wound secondary to trauma lead to reversal of gangrenous changes in the skin and surrounding soft tissue.

Dr Chandrashekar Mahakalkar Abstract

Objectives: To evaluate the efficacy and safety of PRP in the treatment of foot ulcers.

Methods: This randomized controlled trial was conducted in Department of Surgery, J.N.M.C and Acharya Vinoba Bhave Rural Hospital, Sawangi (Meghe), Wardha of DMIMS (DU) from October 2019 to May 2021 where 70 patients of any age with foot ulcers due to any cause and

without involvement of bone were included in the study and were randomly divided into two groups:- Group A(n=35): Patients treated with PRP. (Treatment Arm). Group B(n=35): Patients treated with conventional treatment. (Control Arm). The patients were followed for 30 days and the change in ulcer length and width and surface area were compared at 4 days, i.e. first follow-up, 12 days, i.e. second follow-up, and 30 days, i.e. third follow-up in comparison to admission.

Results: Compared to Group B, Group A had comparable ulcer length, width and surface area at admission, first follow-up, second follow-up, and at third follow-up. In terms of %reduction in surface area, Group A had a significantly higher reduction of surface area at follow-up 1 (23.15 ± 9.41 vs. 15.23 ± 9.58 , $P=0.0009$), at follow-up 2 (37.28 ± 10.69 vs. 26.78 ± 11.31 , $P=0.0002$), and at follow-up 3 (50.27 ± 13.2 vs. 37.73 ± 15.42 , $P=0.0005$). There was significantly lower hospital stay in Group A than Group B (15.97 ± 2.93 vs. 26.34 ± 2.65 , $P<0.0001$). The granulation tissue and pain at third follow up was comparable. None of the patient had adverse drug reaction at any time period.

Conclusion: Overall, PRP seems to have a better efficacy profile in terms of reduction of surface area of ulcers with a lesser hospital stay as compared to the conventional follow up regime of treatment with no additional side effects.

Keywords: efficacy, foot ulcers, PRP, hospital stay, side-effects.

Dr Suryakant Hayatnagar – Use of Platelet growth factor in bone, joint, cartilage and soft tissue in rejuvenation

Use of Orthobiologics and Biocomposites in Periprosthetic Joint Infection and Revision Arthroplasty

Mr. Sunil Nikose¹. Prof. Sandeep Shrivastava², Dr. Aditya Pundkar², Prof. Kiran Saoji², Swapnil Date² and Team

¹Tameside & Glossop Integrated Foundation NHS Trust, UK

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Introduction:

Prosthetic Joint Infection (PJI) is a devastating for the surgeon, patient and the Hospital in terms of greatly increased costs, patient discomfort and dissatisfaction. The Incidence of PJI is around 1-2% of primary total hip and knee arthroplasties. Coagulase-negative Staphylococci are found in in 30-41%, *Staphylococcus aureus* in 12-47%, and Streptococci / and or Enterococci in around 10% while gram-negative bacteria such as *Escherichia coli* are less than 5%.

A Debridement, Antibiotics and Implant Retention (DAIR) is usually employed for acute PJI where the prosthesis is not loose and does not carry much morbidity. In chronic PJI there is usually poor vascularity, formation of the biofilm at infected artificial joints which are usually unresponsive to systemic antibiotic treatment.

Purpose of the study:

To assess the use of calcium sulphate (CS) impregnated antibiotic beads in the management of knee and hip periprosthetic joint infections (PJI) in terms of outcomes, complications and re-infection rates.

Methods:

38 patients having a revision of a total knee replacement (TKR) or a total hip replacement (THR) due to prosthetic infections. There were 31 knees and 7 hip revisions. All patients were treated with meticulous surgical debridement and antibiotics loaded CS beads at revision. Patients having revisions due to aseptic loosening, instability, periprosthetic fractures, metal allergy, implant failure and revisions for pain and stiffness were excluded from the study. We used CS beads for all patients undergoing infected hip and knee arthroplasty. CS powder was mixed with 1 G of Vancomycin + 240 mg Of Gentamicin per 10cc of bead mixture with sterile water.

Outcome Measures:

The Primary outcome measured was based on the recurrence of infection using the Musculoskeletal Infection Society (MSIS) criteria, wound complications such as persistent

wound drainage, purulent exudate and local tissue irritation. Their secondary outcomes included reoperation and reinfection rates

Results:

The procedure when included with meticulous extensive debridement offers high success rate. There was one patient (2.6%) of reinfection at knee and 1 patient (2.6%) had hypercalcemia which was asymptomatic not requiring active treatment.

Conclusion:

The use of CS Impregnated beads in the treatment of PJI is a helpful in delivering high doses of local antibiotic concentration. It has an advantage of getting absorbed completely. A small number of wound discharges, and hypercalcemia cases are reported, which were asymptomatic. Due to the case-mix, small number of patients and the heterogeneity of the cases included in our series, we are unable to draw a valid conclusion on the validity of antibiotics loaded CS bead in the management of PJI of hip and knee arthroplasty and a larger study is warranted.

Keywords: Prosthetic Joint Infection (PJI), Calcium Sulphate (CS), Debridement, Antibiotics and Implant Retention (DAIR), Debridement

Disclosure of Potential Conflicts of Interest - The authors declare that they have no conflict of interest.

Ethical Approval: All procedures performed in this study were in accordance with the ethical standards of the committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards

Informed Consent: Not applicable

Funding statement – No sources of funding received for the study

*******We used the Stimulan® which is commercially available in the UK**

Dr K Vishav Murthy – Role of stem cells in lymphatic regeneration

**The Effect Of Locally Infiltrated Platelet-Rich Plasma On Survival Of Skin Flaps In
Degloving Injuries**

**Dr Suyash Ambatkar(Junior Resident), Dr Sandeep Shrivastava (Professor And
Director), Dr Aditya Pundkar (Associate Professor), Dr Swapnil Date (Senior Resident)**

Background: Partial- or full-thickness necrosis is typically encountered complication postoperatively in skin flap patients. The chief causes of necrosis are reduced arterial flow, venous insufficiency, or both. The skin flap's necrosis occurs in the more distal portion of the flap if arterial or venous flux is insufficient. The other factors owing to the necrosis of the skin flap are qualitative and quantitative deficiency of local growth factors (GFs) and lack of regulation of various GFs. Platelet-rich plasma (PRP) is the concentrate of plasma prepared by serial centrifugation and contains high concentrations of platelets. It is rich in multiple GFs, which are essential for wound healing.

Materials and Methods: Six patients were included in the study. All the patients had traumatic degloving injuries of lower limbs. After primary cleaning and closure of the flaps, from postoperative day 1, all the flaps were infiltrated with autologous PRP infiltration according to STARS therapy till the wounds healed.

Results and Observations: All the wounds healed entirely with PRP. PRP sessions required ranged from 4 to 7 with an average of 5.4. There was no need for additional wound healing procedures, such as serial debridements and skin grafting, in any of the patients. Two patients required other procedures for associated fractures, including K-wire removal and amputation of the fifth toe. Complications such as infection, abscess, or sinus formation were not seen in any patients. After suture removal, the mean $\pm$ two standard deviation total wound area was $31.5 \pm 17.6 \text{ cm}^2$, the mean necrotic area was $7.75 \pm 5 \text{ cm}^2$, and the mean surviving area was $23.75 \pm 13.8 \text{ cm}^2$. The mean percentage survival of the flaps was 75.119%. This value is comparable with other studies.

Conclusion: Our study found that local autologous PRP infiltration in the skin flap of degloving wounds, according to the STARS therapy increases the chances of survival of the flap.

Dr Srihatsa Kumar Mahapatra – Our experience in cell therapy in different surgical problems

Title :- Ultrasound-guided injection of platelet-rich plasma versus corticosteroid for treatment of various tendinopathies.

Dr Suhas Landge

Abstract

Aim of the work

To compare the efficacy of ultrasound-guided platelet-rich plasma (PRP) versus corticosteroid injection for the treatment of various tendinopathies.

Patients and methods

43 patients were included in the study who were diagnosed with various tendinopathies. 12 were of lateral epicondylitis, 15 were of partial Supraspinatus tendon (SST) tear and 16 were of Plantar fasciitis. All were divided into 2 groups treated by ultrasound-guided injection of PRP (group I) or corticosteroid (group II). Patients were evaluated using the visual analogue scale (VAS) for pain, and radiological evidence of healing for tears was determined before and 12 weeks after injection.

Results

The VAS at baseline in group I (7.4 ± 1.8) and II (7.1 ± 1.6) significantly improved after injection (2.1 ± 1.3 and 2.2 ± 1.1 ; respectively). Tears were found in 31 patients. Improvement in the tear and effusion was higher in group I (64% and 58%) compared to group II (30.2% and 52%).

Conclusions

Both PRP and corticosteroid injections were effective in the treatment of tendinopathies. PRP is a safe and good alternative to corticosteroid injection that promotes healing and decreases inflammation. The ultrasound-guided injection may increase efficacy.

Evaluate The Efficacy Of Autologous Blood Injection Versus Local Corticosteroid (Triamcinolone) Injection In Treatment Of Plantar Fasciitis. A Randomised Controlled Study

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Dept. Of Orthopedics, Northern Railway Central Hospital
New Delhi.

Abstract

Background: Plantar fasciitis is the most common cause of heel pain for which professional care is sought. Fortunately most patients with this condition eventually have satisfactory

outcomes with nonsurgical treatment. Recently an injection of autologous blood has been reported beneficial for both intermediate and long term outcome for treatment of plantar fasciitis and there was significant decrease in pain. Hence the present study was undertaken to evaluate the efficacy and role of autologous blood injection in plantar fasciitis by comparing with the local corticosteroid injection.

Material and Methods: The present study was based upon analysis of 60 patients attending OPD, from Feb 2013 to June 2014 with the diagnosis of plantar fascitis treated with conservative methods. 60 patients are randomized in two groups. 30 patient were given ABI and 30 were given local corticosteroid and comparative analysis was made.

Results: Participants were clinically evaluated, A baseline VAS scores and The modified Roles & Maudsley (RM) Score staging of the pain at heel region was recorded prospectively. Cases were treated with autologous blood injection and controls with local corticosteroid injection follow up at 1 week, 4 weeks, and 12 weeks interval after the intervention. The present study showed that, autologous blood injection significantly reduced the pain without complications with no recurrence. It also provided complete relief of pain for the period of three months.

Conclusion: Autologous blood injection reduced the pain based on VAS and functional outcome based on Modified Roles & Maudsley (RM) Score without

complications there by lowering the recurrence rate up to three months in patients with plantar fascitiis. Autologous blood provides intermediate and long term results in term of pain relief in compared to corticosteroid injection which gives short term relief.

Keywords: Planter fasciitis, Autologous blood injection, corticosteroid.

MeSH terms: Heel pain, Autologous growth factor, collagen regeneration.

A COMPARATIVE STUDY OF THE EFFECTIVENESS OF PRP INFILTRATION VERSUS CORTICOSTEROID IN TENNIS ELBOW

Authors:

Dr.Parth Shah (JR3), Dr. Naresh Dhaniwala (Professor), Dr Sandeep Shrivastava (Professor and Director), Dept of Orthopedics, Sawangi, Wardha

Introduction:

Tennis elbow is an inflammatory condition that occurs at the origin of the common extensor tendon. It is the commonest chronic disabling painful condition of the elbow. Elbow pain and tenderness with resisted wrist extension are common manifestations in lateral epicondylitis. At present, platelet rich plasma (PRP) is considered as an ideal biological autologous blood derived component. It can be injected to different tissues where, platelet is activated and it releases high levels of transforming growth factors-beta (TGF- β), platelet derived growth factors (PDGF), fibroblast growth factors (FGF), vascular endothelial growth factors (VEGF) and cytokines at the injected site. These growth factors released from platelet rich plasma promote healing of wound, tendons and bone at cellular level. Recent studies have suggested platelet rich plasma (PRP) to be a safe and effective therapy for tennis elbow.

Purpose:

To compare the effectiveness of single dose injection of autologous platelet rich plasma vs Corticosteroid injection in treatment of Tennis elbow and to measure the outcome.

Study design:

A total of 40 patients with lateral epicondylitis were treated at Acharya Vinoba Bhave Rural Hospital. All patients had minimum three months of symptoms. Randomization and allocation to the trial group were carried out by a lot method. The platelet rich plasma (PRP) was prepared from venous whole blood. After receiving a local anesthetic, all patients had single dose injection of autologous platelet rich plasma or Corticosteroid injection in their extensor tendons at elbow. The primary analysis included visual analog scale (VAS) pain scores and Disabilities of the Arm, Shoulder and Hand (DASH) outcome scores

Conclusion:

Treatment of patients with tennis elbow with PRP reduces pain and increases function significantly and it has reduced the need for surgical intervention, exceeding the effect of corticosteroid injection at the end of 12 weeks follow up.

Key words: lateral epicondylitis; platelet; platelet rich plasma (PRP), corticosteroid, tennis elbow.

To Assess The Effectiveness Of Prp Vs. Steroid Infiltration On Functional Activity And Pain In Patients With Planter Fascitis.

Dr. Shrut Vasavada Jr Iii⁽¹⁾, Prof Dr. Nitin Samal ⁽²⁾(Prof) , Dept Of Orthopaedics, Ja Sawangi, Wardha

Introduction:

Plantar fasciitis is degenerative changes occurring at the site of insertion of plantar fascia on calcaneal tuberosity over medial process. The pain hampers daily activity of person. Heel pain has many differential diagnosis; However, plantar fasciitis, for which clinical treatment is sought, is the most common cause of heel pain. The “etiology of this disorder is multifactorial and can occur traumatically, but most cases are due to overuse”. Sharp pain situated in the anterior part of the calcaneum is the usual presentation. Plantar fasciitis has a partial heel spur (exostosis) association; however, many asymptomatic individuals have bony heel spurs, while there is no spur in many patients with plantar fasciitis. Due to its inability to adapt easily to conservative and interventional modalities, there is an economic burden. Microscopic degeneration and local disruption of collagen matrix with micro tears rather than inflammatory pathology is thought to be the main cause of plantar fasciitis.. Plantar fasciitis is not an inflammatory process rather it is a degenerative process, as ABPs are tissue generator and hence they are superior to CSs. Corticosteroid injections have been used since the 1950s to relieve plantar heel pain. Autologous blood has very high levels of growth factors essential for tissue healing. PRP is an emerging method of treatment that is not commonly recognized or practised. A prospective study of Ragab et al reported average pain in the VAS was 9.1 (range, 8-10) pre-injection. 72 % of patients had extreme limitation of activity and mild activity limitation was seen in 28% of patients before injection. VAS scale showed average of 1.6 score for pain¹⁵ . Sandeep S et al¹⁶ method for “Assisted Regeneration of Skin” (STARS) is a treatment for the healing of wounds with PRP, administered locally in the margins of wound, every 4th day, until the total healing is done. Platelet-rich plasma (PRP) is an ideal product that can be exogenously applied to different tissues where it releases growth factors derived from platelets and improve healing of wound, bone, and tendon. Infection is also prevented from PRP as this has antimicrobial properties. Growth factors are released and initiate the natural healing reaction of the body when platelets are activated. The PRP injection at the attachment of fascia at the os calcis and could induce healing. Therefore the present prospective comparative study was done at tertiary care centre to compare the effectiveness of PRP vs. steroid infiltration on functional activity and pain in patients with Planter fascitis.

Objective:

To study and compare the efficacy of PRP infiltration in patients with plantar fasciitis and the efficacy of steroid infiltration in patients with plantar fasciitis.

Methodology :

All Patients with plantar fasciitis diagnosed clinically and ultrasonographically with thickness more than 4 mm in the department of Orthopaedics, Acharya Vinobha Bhave Rural Hospital, Sawangi (Meghe), Maharashtra attending the OPD/IPD of Tertiary care Hospital who fulfilled the inclusion criteria. A sample size of 30 patients will be selected with two groups of 15 patients in each group.

Conclusion-

We conclude from our study :

Management of planter fasciitis with Platelet-Rich Plasma reduces pain and greatly improves activity, exceeding the impact of steroids on long-term follow-up. “PRP injection is an effective and safe therapeutic choice for the treatment of plantar fasciitis. However, there is a need for broader, longer-term trials to check the efficacy of PRP in the treatment of plantar fasciitis”.

Dr Ayaz Mir Abstract

Abstract: Plantar fasciitis is commonest causes of heel pain. Many conservative noninvasive lines of treatment are numerous, among which platelet-rich plasma (PRP) has recently been demonstrated to be helpful in managing plantar fasciitis.

The aim of this study is to evaluate the platelet-rich plasma-ultrasound-guided injection in the treatment of plantar fasciitis in type 2 diabetes mellitus through randomized double-blinded placebo-controlled study.

Methods: Sixty-two adult diabetes mellitus patients having plantar fasciitis patients were involved in the current study. They were randomly selected from the outpatient attending orthopedic outpatient department of our district hospital at budgam jammu and Kashmir .

They were randomly divided to receive either saline (group 1) or PRP (group 2) injection under ultrasonography (US)-guidance. Assessment was done using visual analogue scale (VAS) for pain intensity at baseline and during 2nd and 6th weeks after injection. Functionally, foot function index (FFI) was used at baseline and during 6th week after injection. Pain relief score (PRS) was measured during 2nd and 6th weeks after injection. Plantar fascia thickness was also measured sonographically by US at baseline and during 2nd and 6th weeks after injection.

Results: There was no statistically significant difference between both groups as regards age, Body Mass Index and baseline US, VAS, and FFI scores. PRP (group 2) showed significant improvement in pain severity and physical limitations in patients with plantar fasciitis. It also showed significant improvement compared to saline group injection considering VAS, US, PRS, and FFI.

Conclusion: The use of PRP injection for treatment of plantar fasciitis resulted in significant improvement in pain according to VAS, PRS, and FFI and a reduction in the thickness of the plantar fascia as measured by US, compared to the saline group.

Dr Aravindhakshan R. – Evaluating the efficacy and feasibility of utilizing BMMNC in treating Diabetic Osteomyelitis patients

Role of PRP in OBSTETRICS and GYNECOLOGY

Prof. Dr. Deepti Shrivastava

Platelet rich plasma is the most commonly used preparation in regenerative medicine and, is containing numerous growth factors present in platelet granularities. The theory underlying this treatment modality was derived from natural healing processes, as the body's first response to

tissue injury is to deliver platelets to the injured area. Platelets promote healing and attract stem cells to the site of the injury. Moving from basic science to clinical practice, PRP injections have been applied to diseased ligaments, tendons, and joints, with superb outcomes in terms of repair. This a review of efficacy and suitability of the use of PRP in gynecology and obstetrics in existing literature. There is no doubt that the released growth factors and proteins have a beneficial effect on wound healing and regeneration processes. So far, its widest application is in reproductive medicine, especially in cases of thin endometrium, Asherman's syndrome, or premature ovarian failure (POF) but also in wound healing and lower urinary tract symptoms (LUTS), such as urinary incontinence or recurrent genitourinary fistula , cosmetic and aesthetic lower genital tract rejuvenation as an auxiliary treatment.

Erectile Dysfunction: Regenerative Medicine is the answer.

**Prof Deepak K Jumani, Senior Sexual health Physician & Counsellor,
Sir JJ Group of hospitals & Grant Govt Medical College, Mumbai
Email: Deepak.jumani@gmail.com**

Abstract :

We live in a country which gave the world a first epic on Aphorisms of Love and Love making "The Kamasutra", We also have ancient temples which show scriptures of love making on its walls, We are living in a Sex saturated society, and are bombarded with images of sexuality in the movies, electronic print media, daily news papers, even billboards. Sadly, though we are all born out of love and sex, we don't talk about it. We are also part of a urbanized civilization today with the impact of internet, stresses at work, travel and hypocritical lifestyle. The freedom and empowerment has lead to increase use of substance of abuse, watching too much of porn, smoking, erratic diet ultimately leading to a unhealthy lifestyle. All this behavioural patterns has resulted in rise of chronic non communicable diseases like Diabetes, hypertension, Obesity, Dyslipidaemia. India has the highest rate of Cardiovascular disease deaths and most of them are due to comorbid conditions like Metabolic syndrome..

There is a compelling evidence to prove us that all the above behavioural risk factors are responsible for decreased sexual functions which include low desire, less arousals, and sexual dissatisfaction, low self esteem, anxiety and depression both in men and women and on individual front it has resulted in increased divorces, sexual violence's and unhealthy relationships.

In Men, Erectile Dysfunction or Penile Attack is one of the most common sexual dysfunction, with multiple etiopathologies. It not only affects the man, but his partner and creates a dent in relationships. Erectile Dysfunction is now proven to be a Subclinical cardiovascular disease and the duration of onset of Coronary Artery disease is within 3 to 5 years of onset of Erectile Dysfunction. Erectile Dysfunction is Endothelial dysfunction and so the point to ponder is that we need to look at the restoration of endothelial dysfunction if at all we need to cure Erectile Dysfunction.

To increase the blood flow in the penile vasculature and to achieve erections PDE5 inhibitors are the ideal choice. The five PDE5 inhibitors we have are Sildenafil 25mg, 50mg, 100mg, Tadalafil 2.5mg, 5mg, 10mg, 20 mg, Vardenafil 10mg, 20mg, Udenafil 100mg and Avanafil 100mg, 200 mg. Most of the PDE5 inhibitors have varied onset and duration of actions and side effects. There are 35-40 percent Non responders and these PDE5 inhibitors are erectogenic drugs and do not increase the Desire. But The recent trend is to give low dose of Tadalafil 5 mg to every diabetic if he is not on Nitrates. The most recent new kid in the block a novel PDE5 inhibitor is Avanafil. Its in the doses of 100mg and 200 mg. This is a drug with fastest onset of action which is 15 minutes and has less PDE6 and PDE11 activity which makes a patient get less myalgia and bluish or green discolouration and less headache and the most important thing about it is that it has a half life of just 5 hours. Studies show that this is the only PDE5 inhibitor which can be safely given to patients who are on Nitrates with only caution that Nitrates should be skipped on the day they take Avanafil

Over the last 2 decades we have been using so many pharmaceutical compounds for our patient with ED, but we have not offered any cure for the same. As none of these approaches reverse the etiopathology of Erectile Dysfunction which is Endothelial Dysfunction.

We have enough evidence to elucidate that we have strategies to improve the endothelial dysfunction today and that is Regenerative medicine by the use of Platelet rich Plasma, Stem Cell therapy and Gene Therapy. Of all these modalities three pioneering studies have shown promising results are the use of Stem cells in curing Erectile Dysfunction.

Regenerative Medicine, which include phytonutraceuticals, Stem cell therapy, Gene therapy, Pigment Epithelium derived factor are a promising approach to give a cure to Erectile Dysfunction

The novel therapies now include Life Style Modification, Regenerative therapies to cure Erectile dysfunction.

Diabetes is the biggest sexual health tsunami of our century. The most common sexual dysfunctions in Male Diabetic we see are Erectile Dysfunction, Early ejaculation and Low Desire. In Female Diabetic we see Hypoactive sexual desire disorder and Depression.

Due to raised advanced glycated end products, and activation of RhoA/Rho kinase activity, and reduced eNOS and NO in the smooth muscle cells of the corpora cavernosa, the penis remains in a constant flaccid state due to generalized cavernosal vasoconstriction.

Control of Hyperglycaemia is mandatory to avoid micro and macrovascular complications. The recent trend to control hyperglycaemia with OHA is to give them Metformin which is now known to improve endothelial functions and along with Metformin, SGLT 2 inhibitors which due to its class effects of weight loss, control of hyperglycaemia, control of dyslipidaemia and having a profile of cardio and nephroprotection is proven to be very useful in giving diabetics a physiological erections. Indian studies have proven that Insulin Pump therapy has improved sexual functions in men to the tune of 83 %.

Testosterone replacement therapy with caution and monitoring PSA for a period of 2 years have brought reversal of Diabetes, Obesity and hypogonadism and hence diabetics restore their sexual functions.

Phyto nutraceuticals like L Arginine and Fenugreek are safer and also have shown promising results in increasing the desire and sexual functions both in males and females.

Counselling on Nutrition, Exercise, Mental health & Life style measures are the most important mainstay for the treatment of sexual dysfunctions in every Diabetic.

Erectile Dysfunction, though just a symptom which is hidden under the sheets, has multifactorial etiopathology viz, Vasculogenic causes like Diabetes, Hypertension, Obesity, dyslipidaemia, Neurogenic Causes like injuries to the spinal cord and many other neurological diseases, Hormonogenic causes like low testosterone, thyroid, pituitary, prolactin, or even drug induced, hypovitaminosis D, hyperuricaemia, environment pollution, smoking excess of alcohol, stresses of any sort and watching porn, has been responsible for the onset of critical events like Myocardial Ischaemia and stroke in men.

Today with intensive lifestyle changes, avoiding smoking and excess of alcohol, giving a u turn to metabolic syndrome, restoring the endothelial stress with Regenerative medicine and with optimum pharmacotherapy and counselling one can manage ED. Hence its rightly said Erectile dysfunction is a tip on an iceberg and yet Erectile dysfunction if diagnosed early is a Correctile Dysfunction.

Sexual fitness is a lifestyle decision as to be sexually fit is a choice one should opt for because all sexual dysfunctions at any age can be managed. I feel sex is sacred, a gift from the Divine, it has a power to heal, to create, to transform and its force in nature. We are all born out of love and as love doesn't expire, Sex has no expiry date.

Autologous Human Platelet Lysate for Arteriogenic Erectile Dysfunction

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Introduction

Erectile Dysfunction (ED) is a condition where there is an inability to achieve a satisfactory penile erection which is neither sustainable for vaginal penetration nor for completing a penetrative sexual act. India is the erectile dysfunction capital of the world. This condition occurs across all age groups of men with a higher incidence in age more than 45 years where it is a harbinger of an imminent myocardial infarction or stroke. Among the various causes of ED, arteriogenic ED has been successfully treated with Phosphodiesterase- 5 inhibitors (PDE5i) like Sildenafil, Tadalafil, Avanafil, Etc. It is a progressive disease where these drugs don't mitigate or modify the disease progression as the underlying pathology of endothelial dysfunction remains unaddressed. In due course penile cavernosal tissues undergoes apoptosis, fibrosis and ultimately patient ends up in a penile prosthesis which doesn't provide natural erection. Hereby, there is an unmet need to modify the disease progression thereby preventing apoptosis & fibrosis and regenerating the cavernosal tissues. Among the various regenerative therapies like mesenchymal stem cells and bone marrow mononuclear cells, platelet rich plasma has been used for erectile dysfunction due to its ease of administration as a day care procedure. The challenge is standardisation of preparation which leads to variability in the amount of growth factors which will be released in plasma following the lysis of alpha-granules, also called as platelet activation. Human Platelet lysate (hPL) prepared by repeated freeze-thawing cycles of platelet concentrates yields higher amount of growth factor release from the alpha-granules. In this study we aim to assess the effect of autologous hPL in arteriogenic ED. Methodology

We conducted an open label single arm interventional study to assess the effect of platelet lysate as an adjunct to standard of care in treating arteriogenic erectile dysfunction at Andregn Clinic, Trichy Tamilnadu. Informed consent was obtained from 30 sexually active male patients above 18 years of age with erectile hardness score (EHS) of ≤ 3 . Endothelial dysfunction, shown by

increased pulse Wave Velocity (pWV) and elevated central aortic pressure (CAP), was measured by Arterial Health Profiler, Genesis Medical Systems Private Limited, Hyderabad and arteriogenic involvement was further confirmed by laboratory investigations like elevated lipid profile, serum homocysteine, blood sugar & HbA1c and decreased Vitamin D, Vitamin B 12, Testosterone. Autologous hPL was prepared at MotherCell Regenerative Center, Trichy, Tamilnadu one hour prior to its intracavernous injection, which was performed at Trichy Medical Center and Hospital. Further patients were monitored for any adverse events prior to discharge. None of the patients developed any immediate or delayed injection site (hematoma) or systemic (allergic/immunogenic) adverse effects. Patients were followed up monthly for a period of 6 months. Progressive and significant improvement in EHS was observed in all patients and they were able to satisfactorily complete the penetrative sexual act. Dosage reduction in their PDE5i medications were possible in 23 patients and 7 patients developed erectile response to PDE5i, which was not observed before. These findings show the disease modifying and regenerative nature of autologous hPL.

Conclusion

Autologous hPL is safe and effective in treating and modifying the course of arteriogenic ED. Further research is required to show the histopathological or immunohistochemical evidences for cavernosal tissue regeneration in these patients.

Autologous Platelet Rich Plasma-A Revolutionary Therapy In The Field Of Gynaecology

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Abstract

PRP (Platelet Rich Plasma) represent a relative new approach in regenerative medicine. The ideology behind PRP treatment is the reversal of red blood cells to 5%(which are less useful in the healing process) and more importantly concentrating platelets containing a powerful concentration of growth factors to 94%. Platelet-rich plasma is being used as a new therapeutic option for different pathologies. The growth factors provided by platelets and plasma are essential to the tissue repair process. It could have its effect due to the microenvironment of the tissue. It is used within the tissue's specific processes for healing and platelet rich plasma possible ability to exchange stem cell proliferation, depending on its preparation, activation, and variable contents. Platelet Rich Plasmas currently considered a new and promising treatment for some gynaecological disorders especially disorders that are not very effective with conventional treatments.

Keywords-platelet rich plasma(PRP), Obstetrics and Gynaecology

Laparoscopic Intraovarian Instillation Of Autologous Platelet- Rich Plasma (PRP) For Ovarian Rejuvenation In Premature Ovarian Insufficiency (POI) And Diminished Ovarian Reserve (DOR)

Dr Shazia Mohammad

Abstract:

Introduction: Attempts to overcome the poor response have been made by many controlled ovarian stimulation (COS) protocols and addition of adjuvants before or during the stimulation, but none have proved successful (21) . This is attributed to a low number of antral follicular count (AFC). A small pool of quiescent primordial follicles remains in the ovaries of these patients, which could potentially contribute to a higher yield of oocyte. Recently, with the emergence of regenerative medicine, many studies have successfully used stem cells or platelet-rich plasma (PRP) for ovarian rejuvenation. **MATERIAL AND METHODS:** Place of study- Endoscopic unit in collaboration with Reproductive medicine unit, Department of Obstetrics and Gynaecology, DMIHER (Deemed to be University, Wardha.

Study Design- Interventional study

Preparation of platelet-rich plasma :

Around 20 ml of peripheral blood in the heparinized syringe was taken and 20 ml of PRP was prepared after double centrifugation

Intraovarian instillation:

Intraovarian instillation was performed laproscopically. Laparoscopy will be performed in standard fashion under general anaesthesia followed by laparoscopic intraovarian instillation of PRP.

Conclusion- The procedure was safe, and no patient had instillation-related adverse effects. the analyses were performed using SPSS 22.0 (IBM Corp, Armonk, New York, United States). The total AFC increase was statistically significant ($P = 0.0001$)

A Comparative Study Between Platelet Rich Plasma And Estrogen For Treatment Of Genito-Urinary Syndrome- A Pilot Study

Dr Tejal Waghe

Genitourinary syndrome of menopause (GSM) is a new term for a condition more renowned as atrophic vaginitis.

Although systemic administration of estrogen can improve the localized symptoms of atrophic vaginitis, women are often reluctant to use systemic hormone replacement therapy and prefer local administration of estrogen.

The effects of PRP treatment have been evaluated recently in many clinical conditions, including wound healing, hair repair, skin regeneration, vulvar lichen sclerosis, stress urinary incontinence, episiotomy scars, and lubrication aging in the vagina with good results.

Currently, PRP has becoming popular as a non-operative treatment option for GSM symptoms. The principle underlying PRP treatment has to do with its ability to reproduce natural mechanisms of cell regeneration through the sequential secretion of numerous growth factors.

It has better compliance, cheaper and less frequent dosing schedule as compared to vaginal estrogen creams.

We aim to study and compare the clinical response of GSM symptoms to estrogen cream and PRP in post menopausal women.

This study will yield useful data to use PRP in treatment of GSM in Indian setting with low budget and equally effective alternative to oestrogen cream with good compliance and less dropout rates.

1. To study the efficacy of PRP in GSM.
2. To study and compare the improvement in Vaginal Health Index in both study groups.
3. To study and compare the improvement in Vulvovaginal atrophy symptoms in both study groups

PRP is an innovative, affordable and easily performed therapeutic modality, which has been recently studied in women with various urogenital disorders.

This is a pilot study and approximately 50 cases will be completed and results to be analysed by the end of January 2023

Autologous intrauterine platelet rich plasma versus GCSF instillation for enhancement of endometrial growth and vascularity in IVF Failure.

Dr.Smruti Mapari

Abstract:

Background: Embryo implantation is a complex process involving interaction between the genetically competent embryo and endometrium and is influenced by local and systemic immune factors. Endometrial thickness is one of the most important factors predicting the outcome of pregnancy in assisted reproduction. Endometrium thickness of < 7mm on the day of ovulation, or at the day of human chorionic gonadotrophin (HCG) injection in fresh in vitro fertilisation (IVF) cycles or the day of starting progesterone in frozen-thawed embryo transfer (FET) cycles is characterised as thin endometrium (Liu et al., 2019). Various treatment options for thin endometrium have been proposed, including high estradiol doses, human chorionic gonadotropin, tamoxifen, pentoxifylline, vitamin E, L-arginine, aspirin, nitroglycerin patches, vaginal sildenafil, acupuncture and neuromuscular electric stimulation, intrauterine administration of granulocyte colony stimulating factor (G-CSF), and stem cell therapy.

PRP is autologous plasma derived from fresh whole blood enriched with platelets. It contains several growth factors such as VEGF, epidermal growth factor (EGF), platelet-derived growth factor (PDGF), transforming growth factor (TGF), and other cytokines that stimulate proliferation and growth. These growth factors are known to regulate cell functions such as attachment, migration, proliferation, differentiation and promote extracellular matrix accumulation.

Intrauterine instillation of granulocyte colony-stimulating factor (G-CSF) to promote endometrial development was first proposed by Gleicher et al.(7) in 2011. Granulocyte-colony stimulating factor is involved in controlling gene expression, thereby influencing local embryo adhesions, cell migration, apoptotic (programmed cell death) activity, angiogenesis (formation of newer blood vessels), and endometrial remodelling, which are important for successful implantation.

Objectives:

1. To observe the endometrial thickness and vascularity with PRP instillation.
2. To observe the endometrial thickness and vascularity with G-CSF instillation
3. To compare the efficacy, safety and cost effectiveness of PRP and G-CSF.

Methodology:

This study include a total of 20 women fulfilling the inclusion and exclusion criteria. These study subjects were divided into two groups A (PRP) and B (GCSF) randomly using envelope method. PRP, prepared from autologous blood by centrifugation, and 0.5 -1 ml of PRP was infused into the uterine cavity on the 10th days of cycle. PRP infusion and GCSF infusion was done 1-2 times in each cycle. Embryos were transferred when the endometrial thickness was more than 7 mm .Patients underwent serial ultrasounds along with Doppler prior to implantation date.

Results: The average increment in the EMT following PRP administration was 0.72, while the average increment following GCSF was 0.82. The average increase in vascularity by PRP was 1.52, while that by GCSF was 1.28 .

Conclusion: Almost negligible cost being autologous.If future studies will confirm its efficacy in improving pregnancy rates of treated patients, PRP could be included as an innovative proposal to treat women with thin endometrium. It is safe, simple to obtain, easy to administer with almost equal effectiveness as of G CSF.

Key words: thin endometrium, platelet rich plasma, granulocyte colony stimulating factor.

Platelet-Rich Plasma's (PRP) clinical potential in boosting reproductive outcome in patients with previous implantation failure

Dr. Shrutika Kapare

Abstract:

Introduction: Platelet-rich plasma (PRP) is a new treatment option for individuals who have had previous implantation failures. PRP influences endometrial cell proliferation and the expression of many endometrial factors involved in endometrial regeneration and repair.

Objective: The purpose of this study is to determine whether platelet-rich plasma (PRP) increases endometrial thickness (EMT) and clinical pregnancy rate (CPR) in women who have experienced previous implantation failure.

Method: A prospective interventional study was carried out at Wardha Test Tube Baby Centre in Sawangi (Meghe). Twenty infertile women who had previously failed to conceive despite standard hormone replacement therapy were assessed. During the Frozen Embryo Transfer cycle, the patients were treated with intrauterine PRP instillation. Endometrial thickness, implantation rate (IR), and clinical pregnancy rate (CPR) were determined and compared to women who had previous implantation failure and were not administered PRP.

Results: Endometrial thickness, implantation rate (IR), and clinical pregnancy rate (CPR) rose considerably in individuals with previous implantation failure who had intrauterine PRP instillation versus patients who did not get PRP.

Conclusion: Intrauterine PRP instillation improves reproductive outcomes in patients who have had previous implantation failure.

Intrauterine PRP instillation in IVF patient for endometrial regeneration.

Dr. Swasti Shukla

A 38 year old women with primary infertility since 17 years , her diagnostic hysteroscopy was suggestive of frozen pelvis with adhesion of bladder upto fundus of uterus , posterior bowel was adhered to uterus ,endometrium was thin and calcified , after PRP treatment she was taken for ivf with donor oocyte and self husband sperm , intrauterine subendometrial PRP instillation was done under hysteroscopy guidance on day 21, cycle prior to IVF and ET was done , after assuring good endometrial outcome on day10 and day 12 , 2 more intrauterine PRP instillation was done and ET on day 21, Eventually after denying from several ivf centers , we were able to provide her motherhood via IVF .

Dr Prachi Ughade – Role of PRP in improving ovarian reserve among women in low AMH

Title : Treatment Of Thin Endometrium With Intrauterine Instillation Of Autologous Platelet Rich Plasma: Our Experience

Dr. Sapna Sharma

**Wardha test tube baby centre,Department of Obstetrics and Gyanecology,Acharya
Vinoba Bhawe Rural Hospital, Sawangi(meghe),Wardha, Maharashtra.**

Abstract:-Thin endometrium non responsive to standard treatments is still a challenge in assisted reproductive technique(ART),which usually results in cycle cancellation and unplanned embryo cryopreservation and increased cost of cycle. Endometrium is one of the main factors in implantation and pregnancy. It is observed that pregnancy rate is increased with growing endometrial thickness.

Method :-This study was conducted to evaluate the effectiveness of PRP in the treatment of thin endometrium.Thirty patients with history of inadequate endometrial growth in frozen thawed embryo transfer(FET) cycles were recruited into the study.Intrauterine infusion of PRP was performed at day 12 nd day 14.Endometrial thickness was assessed.

Results:-In all patients,endometrial thickness increased after PRP treatment and embryo transfer was done in all of them.

Conclusion:-According to this study,it seems that PRP was effective for endometrial growth in patient with thin endometrium.

Keywords:-platelet- rich plasma,thin endometrium,frozen thawed,embryo transfer.

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About this course

This online distance-learning program is designed for doctors and prospective researchers as well as qualified students, dentists and veterinarians to advance their careers in this exciting field.

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The course provides a detailed introduction to the biology of stem cells, including, stem cell types and sources, self-renewal, differentiation and lineage commitment. More importantly, this course introduces the main aspects of Regenerative Medicine. Regenerative Medicine seeks to devise new therapies for patients with severe injuries or chronic diseases in which the body's own responses do not suffice to restore functional tissue.. The strategies used in Regenerative Medicine include stem cell based therapy, biomaterials and scaffolds seeded with cells.

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Certification in Regenerative Medicine (CRM) (Duration: 6 months)

- Covers basics of stem cell biology.
- The course materials will be mailed to the candidates every two weeks.
- The content includes Study materials, Newsletter, Research papers.

Fellowship in Regenerative Clinical Medicine (FRCM) (Duration: 9months)

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