

## Regenerative treatment in Osteoarthritis patients

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### Short Communication

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### DESCRIPTION

Regenerative medicine is a branch of medicine that deals with replacing or regenerating cells or tissues or organs of humans to restore or to get very near to normal activities of human life. Biological tissues found in humans such as blood/fat/bone marrow are the main resources of regenerative medicine which help in natural process of healing of soft tissue structures of human body like muscles, tendons, ligaments and cartilages. "Orthobiologics" refers to the use of biological substances to help musculoskeletal injuries heal quicker. They are used to improve the healing of fractured bones and injured muscles, tendons and ligaments, healing of degenerative joints and are derived from substances that are naturally found in body. When orthobiologics are used in concentrations more than the required limit, they can potentially help speed up the healing processes.

### Regenerative medicine in Orthopedics

The intensity of knee pain was evaluated using the visual analogue scale after the patients have remained in a weight-bearing state for 5 minutes (walking or standing). After this evaluation proper medicine is prescribed. The pain level was rated by each patient from 0 cm to 10 cm where 0 represented 'no pain', and 10 represented 'unbearable pain'.

The modified Western Ontario and MacMaster osteoarthritis index, which is valid and reliable, was used to assess the patient's disability during the condition. A questionnaire is being used to assess how people with disabilities can perform daily activities. This method is efficient and recommended for simple and allows assessment of the patient's perceptions of their functional imbalance. Clinical evaluation along with radiological grading was done before enrolling the cases into study after taking informed consent from patients [1-3].

ESWT is a non-invasive method that uses acoustic waves to treat various musculoskeletal conditions. It promotes neovascularization at the tendon-bone junction, stimulate proliferation of tenocytes and osteoprogenitor differentiation increase leukocyte infiltration, and amplify growth factor and protein synthesis to stimulate collagen synthesis and tissue remodeling. These waves create compression and shear loads on the

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surface of the material. This rapid interaction between compression and shear forces results in cavitations. This is the basic principle behind ESWT. It helps in healing, improves blood supply, and helps in pain reduction. There are two types: Focussed for lithotripsy, non focussed radial or dispersive used in orthopaedics. An electromagnetic source by passing an electric current through a coil to produce a magnetic field generates a shockwave, which results in sudden membrane deflection and generation of pressure waves in a fluid [2-6]. The length of the lens helps to determine the therapeutic point when a lens is used to focus these waves onto the disease area of the body. Piezoelectric sources can produce shockwaves *via* a high-voltage discharge across piezoelectric elements mounted in a sphere, which induces a pressure pulse in the surrounding water that increases to a shockwave. The expansion of each element generates a pressure pulse that enables the self-focusing of waves toward the target, creating an extremely precise focus and high level of energy. The various features of these shockwave devices like energy density, pressure distribution, and total energy at the second focal point, are used to treat a variety of diseases like musculoskeletal disorders and urolithiasis. Chronic OA pain associated with an increase in the number of substance P-positive, nonvascular sensory nerve fibres. Various studies have shown that ESWT can reduce OA pain. This effect is because of the neovascularization, and by repairing inflamed tissues *via* tissue regeneration [7].

### PRP in degenerative disease of knee

It helps in environmental rebalancing in an arthritic joint stimulates regeneration of damaged articular cartilage, stem cell migration can be mobilized. The use of biological agents, including PRP in orthopaedics, has increased exponentially over the previous years because of its autologous nature lack of side-effects, and supposed effectiveness. Platelet rich plasma is an autologous blood product with platelet concentrations much more than the normal.

Tissue repair is a complex process comprising chemotaxis, cell proliferation, angiogenesis, and matrix formation. Platelets play a crucial role in all these functions by releasing growth factors. High concentrations of proteins such as endothelial cell growth factor, vascular endothelial growth factor, platelet-derived growth factor and fibroblast growth factor have led to the conclusion that PRP may be useful in conditions requiring tissue healing. Conversely, transforming growth factor, present in Platelet rich plasma has a negative effect and can lead to non-predictable results. Keeping all the above in mind we decided to combine all these 3 modalities in degenerative knee disease and following protocol was designed by our group [8,9].

## CONCLUSION

Our triple therapy is an alternative treatment or in few cases a definitive treatment in degenerative disease of knee joint. Orthobiologics is definitely a game changer in managing degenerative diseases of knee or any other chronic inflammatory pathology where medical and surgical management has minimal or no role. Triple or multidimensional treatment in mild to moderate OA has better outcome and definitely changed the outcome better than NSAIDs and intraarticular steroids which are just symptom relievers. Hence, the rehabilitation program decreases the pain intensity and improves the knee ROM, isometric quadriceps strength, and level of functional performance in all knee OA groups.

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