Innovative advanced approaches in cartilage tissue engineering

Laila M. Montaser
Menoufia University, Egypt

Statement of the Problem: Due to their weak ego-restoration capacity, cartilage defects that result from joint injury, aging, or Osteoarthritis (OA), are the most often irreversible and are a significant reason for joint suffering and persistent inability. Management of OA is ultimately symptomatic and contemporary ways do not fully retrieve hyaline cartilage and may lead to the occurrence of excessive trophic cartilage. A crucial r`equirement occurs for influential processes to spur cartilage regeneration and merging, and tool up a solid, long-lasting replacement for the primary cartilage. The lack of efficient modalities of treatment has prompted research into tissue engineering for an optimum treatment. The purpose of this study was to show a cornerstone stress on our experimental labor and present our innovative technologies using stem cells and Nano *scaffolds* for renovation of articular cartilage.

Methodology & Theoretical Orientation: Innovative therapeutic approach to encourage and enhance cartilage regeneration was being implemented. Stem cells isolated from the bone marrow of an animal model and expanded under *in vitro* culture. Cartilage defect was found on the articular cartilage of the animal model, and stem cells were transplanted in Nano *scaffolds* then injected for cartilage repair.

Findings: The Nano *scaffolds* provided a platform where a larger volume of tissue maybe produced. The use of the polymer *scaffolds* improved cartilage tissue repair.

Conclusion & Significance: Application of a novel Nano *scaffold* for stem cells delivery was very dynamic to regenerate cartilage tissue. Our pilot study spotlighted the development of new therapeutic solutions for destroyed cartilage tissues. Developing contemporary cartilage therapies toward achieving a successful approach for curing cartilage agonies could improve the quality of new advanced cartilage by applying tissue engineering via the use of stem cells, new Nano-fabricated *scaffolds* and materializing nanotechnology.