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Allogenic mesenchymal stem cells for the treatment of equine degenerative joint disease

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Degenerative joint disease (DJD) is a major cause of reduced athletic function and retirement in equine performers. However, conventional therapies are merely aimed at alleviating the symptoms or enhancing clinical recovery for a short period of time, whereas regenerative medicine aims at long-term clinical improvement and pain relief of the affected joints. Indeed, equine (n=33) as well as human (n=12) studies confirm a clinical improvement of patients with knee injuries after intra-articular mesenchymal stem cell (MSC) injection. Furthermore, due to many interspecies similarities, the horse might be considered as a valuable animal model to evaluate human orthopedic therapies. For all the aforementioned reasons, MSC studies in equine joint pathologies are of therapeutic interest to the scientific community.

In the present study, peripheral blood (PB) from one donor horse was used to isolate MSCs and platelet-rich plasma (PRP) for combined use. Indeed, it has been confirmed that PRP increases the cell viability of chondrocytes, enhances the migration and chondrogenesis of MSCs and improves the clinical outcome of MSC therapy in osteoarthritic joints. However, it has been reported that the clinical effect of PRP alone is significant inferior to the MSC-PRP combination. Therefore, patients with naturally occurring DJD of stifle, fetlock, pastern and coffin joints were included in the study and randomly treated with MSC-PRP or chondrogenic induced MSCs-PRP. Short-and long-term follow-up consisted of a clinical evaluation and scores were given for failure of return to work (0), rehabilitation (1), return to work (2) and return to previous level (3).

In conclusion, the present study reports a considerable, yet joint-specific enhanced clinical improvement when using chondrogenic induced MSCs for the treatment of DJD in horses.

Biography

Charlotte Beerts graduated as a Doctor in Veterinary Medicine in June 2012 from the University of Liège. She received the Pfizer Scientific Prize for an outstanding Master Thesis about the current aspects of Equine Infectious Anemia in Europe. In August 2012 she started an internship in the Equine Clinic Equitom in Belgium. Recently she joined the scientific team of Global Stem Cell Technology (GST) to take part in the further research on stem cell technologies for the treatment of musculoskeletal and metabolic disorders in horses and to turn her passion into her carrier.

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