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Therapeutic potential of mesenchymal stem cells to treat Achilles tendon injuries

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Rupture of the Achilles tendon diminishes quality of life. The gold-standard therapy is a surgical suture, but this presents complications, including wound formation and inflammation. These complications spurred evaluation of the therapeutic potential of mesenchymal stem cells (MSCs) from adipose tissue. New Zealand rabbits were divided into 6 groups (three treatments with two time points each) evaluated at either 14 or 28 days after surgery: cross section of the Achilles tendon (CSAT); CSAT+Suture and CSAT+MSC. A comparison between all groups at both time points showed a statistically significant increase in capillaries and in the structural organization of collagen in the healed tendon in the CSAT+Suture and CSAT+MSC groups at the 14-day assessment. Comparison between the two time points within the same group showed a statistically significant decrease in the inflammatory process and an increase in the structural organization of collagen in the CSAT and CSAT+MSC groups. A study of the genomic integrity of the cells suggested a linear correlation between an increase of injuries and culture time. Thus, MSC transplantation is a good alternative for treatment of Achilles tendon ruptures because it may be conducted without surgery and tendon suture and therefore has no risk of adverse effects resulting from the surgical wound or inflammation caused by non absorbable sutures. Furthermore, this alternative treatment exhibits a better capacity for wound healing and maintaining the original tendon architecture, depending on the arrangement of the collagen fibers and has important therapeutic potential.

Biography

Maria Helena Costa Vieira earned her Master in Health and Development in the Midwest from Mato Grosso do Sul University, Campo Grande in 2013. Her Ph.D started this year aiming the effect of stem cell use in tendons in humans. She is currently an assistant professor of medical residency program in Orthopedics and Traumatology, UFMS and medical school.

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