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Intramuscular growth hormone plasmid DNA eletrotransfer effects on bone quality in a murine model of osteogenesis imperfecta

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Osteogenesis imperfecta (OI) is a congenital dysplasia of connective tissue characterized mainly by fragility and low bone density. The type I OI, a mild form of the disease, is associated with the quantitative decrease of type I collagen in the extracellular matrix, a characteristic also observed in the oim mice used in pre-clinical OI research. Previous studies have shown the efficiency of recombinant human growth hormone (GH) treatment for OI, both in animal and human models, reducing bone fragility, increasing bone density and stimulating $\alpha 1$ and $\alpha 2$ procollagen synthesis. This work aimed at using plasmid containing the murine GH (mGH) gene to treat oim heterozygous mice. Serological quantification of mGH by ELISA was carried out to evaluate the plasmid expression, bone density by DEXA and three-point flexion test were performed on the femurs to assess bone quality. In a short-term (3-day) trial, mGH levels of treated animals were 20.6 ± 6.6 ng/mL, versus 3.3 ± 2.2 ng/mL for those receiving saline and 2.3 ± 1.3 ng/mL for the untreated wild-type group. A 90-day assay with plasmid applications at 0, 30 and 60 days was performed in parallel. The results of bone density showed greater effectiveness of the hormone during the first month of treatment, with a 34% increase in comparison with the saline group, whereas in the second month there was no significant statistical difference ($p > 0.05$). The three-point bending test and the final analysis of bone density are currently being carried out.

Biography

Gustavo Protasio Pacheco de Jesus holds a Bachelor's degree in Biomedicine from Lusiada University Center - Santos (2010) and a Master's degree in Pathology from the Federal University of São Paulo (2013). He has published 7 articles and a book chapter and is currently a PhD student at the Biotechnology Center of the Nuclear and Energy Research Institute, located in the University of São Paulo campus and Professor of Pathology, Immunology, Microbiology and Environmental Analysis at Lusiada University Center - Santos.

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