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Physiological and histological effects after implanting pluripotent stem cells in a murine model with anal canal injury

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A nal sphincter disruption is one of the most common causes of fecal incontinence as a result of obstetric anal sphincter injury, anorectal surgery or trauma, with few therapeutic options. Stem cells therapy has shown the benefits for tissue restoration and immunomodulation. Therefore, the aim of this study was to analyze the histological and functional effects after implanting mouse Pluripotent Stem Cells (mPSCs) in a murine model with anal canal injury (ACI). To develop this research, 42 female Wistar rats were subjected to ACI and divided into 3 groups. Group 1 (control group) was treated with 300 µl of isotonic saline solution (ISS), group 2 (late treatment, 30, 37 and 45 days after ACI) and group 3 (early treatment, 24 hours, 7 and 14 days after ACI) received 50,000 mPSCs resuspended on 300 µl of ISS. All animals were evaluated by high resolution manometry 24 hours before and after ACI and 3 months after ACI. Finally, rats were sacrificed on the third month and histopathological sections from anal canal were obtained. Physiological results showed that the groups treated with mPSCs presented higher basal electrical activity and maximum voluntary squeeze pressure measures 3 months after ACI, highlighting the statistical significance on group 3. Moreover, histopathological results evidenced better restoration of the histological architecture on experimental groups showing neoformation of fibroblasts and capillaries. In conclusion, PSCs implant on ACI improve anal sphincter tone as well as histological architecture, presenting better regenerative results when they are implanted as an early treatment.

Biography

Monica Maribel Mata Miranda is a Professor and Laboratory Head of Cell Biology at Escuela Medico Militar, Mexico. She has earned her BSc in Medicine at Escuela Medico Militar and MD with honor in Biomedical Sciences from Escuela Militar de Graduados de Sanidad. Presently, she is a PhD candidate at Centro de Investigación en Biotecnología Aplicada of the Instituto Politecnico Nacional. Her work is based on stem cells applications and differentiation.

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