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The experimental study about the transplantation of adipose-derived adult stem cells for the treatment of stress urinary incontinence

Hongjuan Song
Xuzhou Medical College, China

Abstract

Currently, the incidence of stress urinary incontinence (SUI) among females is approximately 15% -60%. SUI is one of the diseases that influence the quality of female's life. Unfortunately, to date, there are no effective methods for treatment of SUI. In this study, a combined mixture of adipose-derived stem cells (ADSCs), collagen, and 5-Aza inducing factor was implanted into the underneath of the mucosa and the muscle layers surrounding the upper section of the ureter of the female rats with SUI. After implantation, histological analysis was performed on the ureter and the surrounding tissues of the animals. The ureter was taken off from the experimental rats and stained via hematoxylin and eosin (HE) staining, and the morphological changes of ureter and the surrounding tissues were visualized with electron microscopy.

Methods: Observation of the status of migration, distribution and proliferation of the implanted ADSCs within the animal body after implantation: the status of migration, distribution and proliferation of the green fluorescent protein (GFP)-labeled ADSCs were visualized with laser confocal fluorescent microscopy. Furthermore, the changes in the ultrastructures of the ureter tissues (e.g. the ultrastructures of striated muscle and urethral sphincter of the ureter) were visualized under electron microscopy and the histopathological changes in ureter were and the surrounding tissues were observed with histopathological staining.

Result: In this study, we found that collagen stimulated the survival of the implanted ADSCs, improved the implanted microenvironment, enhanced the effectiveness of treatment with ADSCs for SUI, enhanced the ability of ureter in expansion/contraction and in control of urine, and made up the dysfunction of inherent urethral sphincter of the ureter. A combination of using collagen as the supporting material and implantation with ADSCs as the therapeutic agent could be an effective way of using ADSCs in treatment of SUI.

Biography

Hongjuan Song has completed her doctor's degree in China Pharmaceutical University in Reproductive Endocrinology during 2009, and completed her MD in Reproductive Endocrinology at Nanjing Medical University during 2003. Hongjuan is a Chief physician and Director of Gynecology Department in Xuzhou Maternity and Child Health Care Hospital. She have strong knowledge of Gynecology and Obstetrics that She was once the only teaching assistant in Xuzhou Medical College who was in charge of undergraduate students education in Gynecology and Obstetrics and she was honored as the Most Popular Young Teacher by Xuzhou Medical College for many a times. She has rich experiences in handling common acute and critical disease in obstetrics.