

Stem cell therapy shows promise in repairing stress urinary incontinence

August 20 2012

Stress urinary incontinence (SUI) can occur due to sneezing, coughing, exercising or even laughing and happens because the pelvic floor muscles are too weak causing leakage when the bladder is put under pressure. New research published in BioMed Central's open access journal *BMC Medicine* shows that a new technique, using stem cells isolated from amniotic fluid, can regenerate damaged urethral sphincter muscles and prevent pressure incontinence in mice.

Although SUI is more common during and after pregnancy, and after the age of 40, one in three women will experience it at some point in their lives. Men can also be affected, especially after [prostate surgery](#). SUI is treatable and in many cases losing weight, reducing [caffeine intake](#), pelvic floor exercises, and bladder training can have very beneficial effects. If this does not work more invasive treatments are necessary, however there can be serious side effects associated with surgery.

Using stem cells to regenerate the damaged or weak muscles has been proposed as an alternative to surgery. But most protocols for harvesting stem cells also require [invasive procedures](#), and often produce very low numbers of viable cells. In contrast amniotic stem cells can be collected easily, and have very low immunogenicity, reducing chances of rejection. Researchers from Kyungpook National University, Korea, investigated the ability of stem cells isolated from human amniotic fluid obtained during routine [amniocentesis](#) to regenerate damaged urethral sphincter muscles in mice.

James Yoo and Tae Gyun Kwon, who led this research, explained, "These stem cells are mesenchymal and consequently have the ability to become [muscle cells](#) when grown under the right conditions. We found that the stem cells were able to survive for seven days inside the mice but by 14 days they had all disappeared. Nevertheless they were able to induce regeneration of the mouse's own urethral sphincter muscle."

Quite how stem cells are able to retrain the body's own cells is still not fully understood. Not only was muscle regenerated, but this muscle had proper connections to nerves, and was able to improve the pressure required in the bladder before incontinence begins and stops. Humans are already being treated with stem cell therapy for diseases, including diabetes, and since amniotic stem cells appeared to cause no immune response or tumour formation, these cells may provide an avenue for future stem cell therapy for humans.

More information: Female Human amniotic fluid stem cell injection therapy for urethral sphincter regeneration in an animal model, Bum Soo Kim, So Young Chun, Jong Kil Lee, Hyun Ju Lim, Jae-Sung Bae, Ho-Yun Chung, Anthony Atala, Shay Soker, James J Yoo and Tae Gyun Kwon, *BMC Medicine* (in press)

Provided by BioMed Central

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