Introduction

Stem cells are endowed with the capacity to self renew and to differentiate into various cell types, depending on the stimuli that they receive. They are classified into embryonic stem cells (ESC) and adult stem cells (ASC). Whereas ESCs are derived from the inner cell mass of a blastocyst. ASC usually originate from various tissues of a developed individual adult. Because ASC can also be isolated from a developing individual (fetus, infant), they are alternatively called somatic stem cells (SSC) ***(Kolf et al., 2007)***.

Although embryonic stem cells have a greater differentiation potential than adult stem cells, the former is lagging in reaching clinical applications because of ethical concerns and governmental restrictions ***(Nakagawa et al., 2008)***.

Bone marrow stem cells (BMSC) are the best studied adult stem cells (ASCs) and have the potential to treat a wide variety of diseases, including erectile dysfunction (ED) and male infertility ***(Lin et al., 2008a)***.

More recently discovered adipose tissue derived stem cells (ADSC). They are virtually identical to bone marrow stem cells (BMSC) in differentiation and therapeutic potential, but are easier and safer to obtain. They can be harvested in large quantities, and have the associated benefit of reducing obesity. Therefore, ADSC appear to be a better choice for future clinical application ***(Lin et al., 2009)***.

The therapeutic potential of ADSC has been tested in several medical disciplines particularly Orthopedic, Cardiology and Neurology. Although most of these studies took place in pre-clinical setting (i.e. using animal models), a few trials involving human patients have conducted ***(Lendeckel et al., 2004)***.

Andrology compared with other fields has been relatively late to embrace stem cells as potential therapeutic agents. Researches had been concentrated in two areas: Erectile Dysfunctions and Male Infertility ***(Deng et al., 2003)***.

Stem cells researches reported much potential for management of erectile dysfunctions through differentiation into neuron-like cells to treat degenerative changes in neurogenic ED ***(Ning et al., 2006)***, differentiation into smooth muscle cells in corpus cavernosum ***(Song et al., 2007)***, and reversing age associated ED ***(Bivalacqua et al., 2007)***.

In regard to male infertility, reports including differentiation into mature seminiferous tubular structure, supporting of spermatogenesis ***(Nayernia et al., 2004)*** and differentiation into germ cells helps to generate offspring mice ***(Nayernia et al., 2006b)***.

There are other researches include stem cells potentials in pathogenesis or therapeutic trials of other conditions; such as prostate cancer and testicular tumors ***(Rizzo et al., 2005)***.