Cavernous Nerve Reconstruction after Transplantation to Rats of $CD133^+$ Cells Derived from Human Bone Marrow

Introduction and Objective: To assess the effect of endothelial progenitor cells on the regeneration of cavernous nerves after radical prostatectomy.
Materials and Methods: The right and left cavernous nerves of 12-week-old male nude rats were excised to make an approximately 3-mm gap. Alginate gel sheets supplemented with 1×10^4 $CD133^+$cells derived from human bone marrow were then placed over the gaps on both sides (CD133 group, n=14). Twelve weeks later we measured intracavernous pressure (ICP) and mean arterial pressure (MAP) during electrical stimulation of the major pelvic ganglion. The prostate glands were then harvested and immunohistochemically analyzed for human nuclei (HNA), the neural marker S100, and the endothelial marker von Willebrand factor (vWF). The same experiments were performed on sham-operated rats (sham group, n=12), rats with only the nerve excision (excision group, n=12), and rats with alginate gel sheets placed on intact cavernous nerves (alginate group, n=14).
Results: The mean ICP/MAP of the CD133 group, 0.57±0.26, was significantly (*P*=0.01) higher than that of the excision group, 0.31±0.20, but the mean ICP/MAP of the excision group did not differ significantly from that of the alginate group, 0.38±0.24. HNA-positive cells were observed tissue adjacent to the prostates from the CD133 group. Some of the HNA-positive cells also for vWF but none of them showed immunostaining for S100.
Conclusions: The results show that human $CD133^+$cells might facilitate recovery from cavernous nerve injury by differentiating into blood-vessel cells.