Abstract
Radical prostatectomy (RP) is the most commonly employed curative intervention for the treatment of prostate cancer. However, due to the proximity of the cavernous nerves (CN) to the prostate, RP results in transient and/often permanent erectile dysfunction (ED). While the prevention of traction injuries during the RP is critical for the preservation of erectile function, several preclinical studies have demonstrated the beneficial effects of neuroprotective (or neuroregenerative) agents in mitigating neuronal injuries sustained during RP. The maintenance or restoration of erectile function after injury may be enhanced in the postoperative period by the stimulation of neurogenesis to protect and restore injured nerves from further deterioration. The present review aims to evaluate and summarize research of these treatment strategies as published in the National Library of Medicine (Pubmed) from 2000 to 2014. The keywords used for the search were ED, RP, CN injury, immunophilin ligands, neurotrophins and phosphodiesterase (PDE)-5 inhibitors, and animal models. Current guidelines for treatment targeting CN recovery recommend the use of immunophilin ligands, neurotrophins, brain-derived neurotrophic factor, glial cell-line derived neurotrophic factor, sonic hedgehog (Shh), Rho-kinase, PDE-5 inhibitors, erythropoietin (EPO), hyperbaric oxygen therapy, super enzyme gene therapy, stem cells, and triiodothyronine (T3) therapy. Additionally, this review identifies remaining gaps in general knowledge and recent updates recognizing the need for further preclinical and clinical trials.

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