

Versatile effects of sildenafil: Recent pharmacological applications

Uthayathas, S.^{ab}, Karuppagounder, S.S.^a, Thrash, B.M.^a, Parameshwaran, K.^a, Suppiramaniam, V.^a and Dhanasekaran, M.^a

^a Division of Pharmacology and Toxicology, Department of Pharmacal Sciences, Auburn University, United States

^b Department of Animal Science, University of Jaffna, Thirunelvely, Sri Lanka

Abstract

Sildenafil is a phosphodiesterase-5 (PDE5) inhibitor and is predominantly used in the treatment of erectile dysfunction. While maintaining an excellent safety and tolerability profile in the management of erectile dysfunction, sildenafil also provides a prolonged benefit in various other diseases. Sildenafil has been shown to have a potential therapeutic efficacy for disorders related to the central nervous system and pulmonary system. In the central nervous system, it exerts its neuroprotective effects in multiple sclerosis and has a significant memory enhancing action. Sildenafil also significantly enhances neurogenesis. Several lines of evidence indicate that targeting PDE5 with sildenafil offers novel strategies in the treatment of age-related memory impairment. Guanylate cyclase/cGMP/protein kinase G pathway or glutamate nitric oxide cGMP pathways appears to mediate memory enhancing-effects. Some of the positive cognitive features of sildenafil therapy are likely attributable to the mechanisms reviewed here. Sildenafil has been shown to reduce pulmonary hypertension and alleviate pain in animals and humans. The present review primarily focuses on the various pharmacological effects of sildenafil with regard to its influence on the nervous and pulmonary system.

Author keywords

Antinociception; Memory enhancement; Neurogenesis; Pulmonary hypertension; Sildenafil

Indexed keywords

EMTREE drug terms: 2 morpholino 8 phenylchromone; anticoagulant agent; antithrombocytic agent; beta interferon; calcium channel blocking agent; cholinesterase inhibitor; corticosteroid; cyclic GMP dependent protein kinase; dexfenfluramine; dextromethorphan; fenfluramine; galantamine; glatiramer; guanylate cyclase; immunosuppressive agent; inotropic agent; ketamine; memantine; mitoxantrone; muscle relaxant agent; n methyl dextro aspartic acid receptor blocking agent; nitric oxide; opiate; phosphodiesterase V inhibitor; sildenafil; tadalafil; vardenafil; vasodilator agent

EMTREE medical terms: amnesia; attention disturbance; blurred vision; burning sensation; central nervous system; clinical trial; diarrhea; dizziness; drug effect; drug efficacy; drug eruption; drug safety; drug targeting; drug tolerability; erectile dysfunction; flushing; headache; human; low drug dose; memory; memory disorder; multiple sclerosis; nervous system development; neuroprotection; nonhuman; nose disease; pain; painful erection; pruritus; pulmonary hypertension; respiratory system; review; seizure; side effect; stomach discomfort; syncope; thorax pain

MeSH: Alzheimer Disease; Erectile Dysfunction; Humans; Hypertension, Pulmonary; Male; Multiple Sclerosis; Neurons; Pain; Phosphodiesterase Inhibitors; Piperazines; Purines; Sulfones

Medline is the source for the MeSH terms of this document.