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A Review on Pharmacological Activities of Centrally Acting Drugs Clonidine & Duloxetine

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Abstract: *This review explores the pharmacological profiles, clinical applications, and recent research trends of two centrally acting drugs:* ***Clonidine*** *and* ***Duloxetine****. Clonidine, and α2-adrenergic receptor agonist, has traditionally been used as an antihypertensive agent but has gained renewed attention due to its analgesic, sedative, and opioid-sparing properties in anaesthesia and palliative care. It demonstrates efficacy in managing symptoms of ADHD, opioid withdrawal, and various pain syndromes. Novel formulations such as transdermal patches, nanocarrier, and long-acting injectables have enhanced its clinical applicability. Duloxetine, a selective serotonin-norepinephrine reuptake inhibitor (SNRI), is approved for major depressive disorder, generalized anxiety disorder, and chronic pain conditions like diabetic peripheral neuropathy, fibromyalgia, and osteoarthritis. Its mechanism of action involves modulation of central pain pathways and mood-regulating neurotransmitters. Duloxetine's favourable safety profile and efficacy in both mood and somatic symptom management have led to expanding clinical use, including combination therapies and emerging indications. This review highlights their distinct yet complementary therapeutic roles and underscores the importance of formulation advancements and clinical monitoring to optimize efficacy and minimize adverse effects in diverse patient populations*

Keywords: Clonidine, Duloxetine, α2-adrenergic agonist, SNRI, chronic pain, depression, drug delivery systems, transdermal patch, nanocarrier, analgesia, psychiatric disorders

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