Ondansetron: A Selective 5-HT3 Receptor Antagonist and Its Applications in CNS-Related Disorders

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ABSTRACT

Ondansetron is a selective 5-hydroxytryptamine3 (5-HT3) receptor antagonist that has been introduced to clinical practice as an antiemetic for cancer treatment-induced and anesthesia-related nausea and vomiting. Its use under these circumstances is both prophylactic and therapeutic. It has a superior efficacy, safety and pharmacoeconomic profile compared with other groups of antiemetics, namely antidopaminergics, antihistamines and anticholinergics. However, its place in the management of anticipatory and delayed vomiting in cancer treatment and as a rescue antiemetic in surgical patients needs to be further explored. Furthermore, recent animal and human research also reflects its possible novel application in the treatment of other disease states, such as alcoholism, cocaine addiction, opioid withdrawal syndrome, anxiety disorders, gastrointestinal motility disorders, Tourette’s syndrome and pruritus. This review revisits the widespread physiological and pathological effects of 5-HT and discusses both the basic science literature and the clinical developments responsible for the conventional and novel uses of ondansetron. In addition, new discoveries relating to the effects of ondansetron on other receptors/channels and their possible therapeutic applications are presented.