Cannabinoids as Therapeutics
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Cannabinoids: effects on vomiting and nausea in animal models

Linda A. Parker, Cheryl L. Limebeer and Magdalena Kwiatkowska

Department of Psychology, Wilfrid Laurier University, Waterloo, Ontario, Canada N2L 3C5

Introduction

The development of chemotherapy treatment has prolonged the lives of many cancer patients. However, use of these powerful drugs presents a serious challenge to both clinicians and patients. Significant side effects of cancer chemotherapy include nausea and vomiting which may last for several days. These symptoms come to be dreaded by patients, often interfering with successful completion of treatment. The emetic reflex is conventionally considered to include vomiting, retching and the more subjective sensation of nausea. However, the organization of the reflex is very complex, because although nausea, retching and vomiting usually occur in a temporal sequence, they can be separated experimentally [1].

Vomiting is a widespread protective reflex that serves to expel accidentally ingested toxins from the upper gastrointestinal tract. The sensation of nausea serves as a warning (as does pain), and usually results in the cessation of ingestion and an associative aversion to the ingestant in the future. The act of vomiting is often followed by a feeling of well-being which may serve to reinforce that behavior [1]. In the case of chemotherapy patients, however, the vomiting reflex does not remove the perceived toxin; therefore, in contrast to the removal of an ingested toxin from the gut, vomiting is not self-limiting [1].

Chemotherapy patients experience three separate types of emetic episode: (1) acute nausea and/or vomiting occurs within minutes to hours of receiving a dose of a toxic chemotherapy drug, (2) delayed nausea and/or vomiting that has been arbitrarily defined as emesis begins or persists more than 24 h after chemotherapy, and (3) anticipatory nausea and/or vomiting (ANV) occurs when the patient is re-exposed to cues associated with the toxin. ANV occurs in nearly half of patients treated, frequently during later cycles of chemotherapy [2]. The more intense the initial acute emetic episode, the worse the resultant ANV.

A major advance in the control of emesis was the finding that blockade of one subtype of the 5-hydroxytryptamine (5-HT) receptor, the 5-HT_3 receptor, could suppress the acute emetic response (retching and vomiting) induced by cisplatin in the ferret and the shrew [3–7]. In clinical trials with humans, treatment with