Ginger as an Antiemetic Modality for Chemotherapy-Induced Nausea and Vomiting: A Systematic Review and Meta-Analysis

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Chemotherapy-induced nausea and vomiting (CINV) is a well-known and distressing side effect of chemotherapy. The control of CINV is significantly improved with effective antiemetics such as 5-hydroxytryptamine-3 (5-HT\textsubscript{3}) receptor antagonists (RAs), neurokinin-1 (NK-1) RAs, and dexamethasone. The use of currently recommended antiemetic regimens has enabled the achievement of high rates of complete response, which is defined as no emesis and no need for rescue medication (Gralla et al., 2003; Hesketh et al., 2003; Poli-Bigelli et al., 2003). However, considerable numbers of patients report experiencing nausea from chemotherapy. An estimated 36%–62% of patients report experiencing nausea during the delayed phase, defined as 24 hours postchemotherapy, even with concurrent use of a guideline-recommended antiemetic regimen (i.e., aprepitant, palonosetron, and dexamethasone for highly emetogenic chemotherapy; palonosetron and dexamethasone for moderately emetogenic chemotherapy) (Aapro et al., 2010; Celio et al., 2011; Navari, Gray, & Kerr, 2011). Less effective control of CINV during the delayed phase and the symptom of nausea with currently available antiemetics have led researchers to search for nonpharmacologic approaches for improving the control of CINV.

Ginger (Zingiber officinale) is a traditional antiemetic, the effects of which have been investigated since ancient times. Studies have found antiemetic properties of ginger as the inhibitory effects of its components (i.e., gingerols and shogaols) at 5-HT\textsubscript{3} receptors (Abdel-Aziz, Windeck, Ploch, & Verspohl, 2006; Pertz, Lehmann, Roth-Eh rang, & Elz, 2011) and cholinergic M\textsubscript{3} receptors (Pertz et al., 2011). An antiemetic effect of ginger in the control of postoperative nausea and vomiting has been supported by a meta-analysis (Chaiyakanapruk, Kitikannakorn, Nathsuwan, Leeprokobboon, & Leelasettagool, 2006). A Cochrane review suggested the possible benefit of ginger in the control of pregnancy-related nausea and vomiting (Matthews, Dawswell, Haas, Doyle, & O’Mathúna, 2010). However, studies regarding the effect of ginger in CINV control have yielded both positive and negative results, making its efficacy uncertain (Dabbour, 2007; Levine et al., 2008; Manusirivithaya et al., 2004; Pace, 1986; Pecoraro, 2003; Poli-Bigelli et al., 2003). However, considerable numbers of patients report experiencing nausea during the delayed phase, defined as 24 hours postchemotherapy, even with concurrent use of a guideline-recommended antiemetic regimen (i.e., aprepitant, palonosetron, and dexamethasone for highly emetogenic chemotherapy; palonosetron and dexamethasone for moderately emetogenic chemotherapy) (Aapro et al., 2010; Celio et al., 2011; Navari, Gray, & Kerr, 2011). Less effective control of CINV during the delayed phase and the symptom of nausea with currently available antiemetics have led researchers to search for nonpharmacologic approaches for improving the control of CINV.

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