

Omeprazole: A Proton Pump Inhibitor for the Management of Acid-Related Diseases

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Abstract: Omeprazole (OME) is a common medicine used to treat stomach and digestive problems. While it is effective, using it for a long time may increase the risk of stomach cancer. To better understand this, researchers looked at studies published up to August 2019 using PubMed, Scopus, and ScienceDirect. They reviewed 80 clinical studies, 46 lab (in vitro) studies, and 76 animal (in vivo) studies. The results were mixed. Some studies show that taking OME in high or long-term doses (5 to 40 mg/kg) may cause genetic damage, which could lead to cancer. However, OME also has benefits, such as reducing stomach acid, lowering inflammation, and protecting the stomach lining. These effects happen through changes in body chemicals (like COX-2, interleukins, caspases, and BCL-2), improved blood flow, and less damage from white blood cells (neutrophils). Still, several side effects have been reported, especially in clinical settings. These include: Stomach lining damage (atrophic gastritis). Vitamin B12 (cobalamin) deficiency. Body chemical imbalances (homeostasis disorders). Growth of polyps in the stomach. Liver damage (hepatotoxicity). Cell damage (cytotoxicity). DNA damage (genotoxicity). In summary, while Omeprazole can help treat stomach issues, using it for a long time or without medical advice may lead to serious health risks, including genetic damage and a higher cancer risk. So, it's important to use this drug carefully and under medical supervision.

Keywords: Cobalamin deficiency, Atrophic gastritis, Hepatotoxicity, Apoptosis markers, Anti-inflammatory effects, Self-medication risks

