ABSTRACT

Gastritis is a disease characterized by the presence of inflammation in gastric mucosa. Chemical gastritis is a type of gastritis, which occurred due to the prolonged usage of NSAIDs, including aspirin; bile reflux; or other forms of chemical injury. In 2010, about 43 millions of adults in the United States took aspirin for at least three times per week for more than 3 months. The consumption of aspirin is also expected to increase in the future, especially for aging population. Although there are several treatments for aspirin-induced gastritis, it might not work well for some patients due to poor effectiveness and patient compliance. Nowadays, plant extract can be considered as an alternative therapy for digestive system disorder and peptic ulcer disease management. According to WHO, approximately 65-80% of the current developing countries still utilize medicinal plants as remedies. However, up until now, there has not been any systematic review about the efficacy of plant extracts against aspirin-induced gastritis. Therefore, the aim of this review is to systematically evaluate the pharmacological activities and efficacy of plant extracts against aspirin-induced gastritis. Out of 337 studies, only 26 studies met the inclusion criteria. All of the selected 26 studies were conducted in various animal models. The result showed plant extracts possess numerous pharmacological activities and gastroprotective mechanisms against aspirin-induced gastritis, such as anti-inflammatory, antioxidant, antiulcer, gastric acidity reduction, stimulation of gastric mucosal production, and other pharmacological activities. The anti-inflammatory activity of plant extracts mainly associated with the reduction of pro-inflammatory cytokines and white blood cells recruitment. The antioxidant activity related with the increased of gastric antioxidant systems, such as CAT, GSH, GSH-Px, GST, GR, and SOD, followed by reduction in lipid peroxidation process. Gastric acidity was reduced via gastric pH elevation, suppression of gastric volume and total acidity. Stimulation of gastric mucosal production was induced by higher PGE2 level and mucosal cells proliferation. Other pharmacological activities mainly correlated with NO levels to maintain gastric blood flow conditions and lowered peptic activity to prevent gastric cells death. Additionally, several plant extracts managed to established considerable pharmacological activity toward aspirin-induced gastritis. *T. pentranda* and *A. manihot* extracts decreased ulcer index (UI) up to 0, while *A. marmelos* extract increased gastric mucosal thickness up to 602.45$\pm$0.04 µm. Moreover, *V. amygdalina* leaves extract

demonstrate the greatest efficacy in terms of gastric pH value elevation up to 5.27±0.18, yet able to maintain architecture of healthy stomach tissues in contrast with other plant extracts. Interestingly, *M. oleifera* aqueous extract and *O. basilicum* hexane extracts have a very broad pharmacological activity based on the results. Nevertheless, further studies are required to confirm whether the other plant extracts elicit these pharmacological activities and gastroprotective mechanisms against aspirin-induced gastritis.

Keywords: plant extracts, aspirin-induced gastritis, systematic review