

CHAPTER I

INTRODUCTION

Gastroduodenal ulceration is a common disease in both developed and developing countries (Pavo et al., 2000). Gastric ulceration, including acute erosions, is a multifactorial disease involving well-known factors such as trauma, stress, sepsis, hemorrhagic shock, burns, pulmonary and liver disease, and drug such as reserpine, epinephrine and steroids. In about 60-80% of patients, the etiologic factors are unknown (Mozsik G et al., 1988).

Gastric ulcers are produced by an imbalance between the gastroduodenal mucosal defense mechanisms and the damaging forces. Impaired mucosal defense must be invoked in these ulcer patients with normal levels of gastric acid and pepsin. The patients chronically using NSAIDs, including aspirin, can a finger be pointed with some assurance at suppression of mucosal prostaglandin synthesis and direct irritative. Cigarette smoking impairs healing and favors recurrence, possibly by suppression of mucosal prostaglandin synthesis. Alcohol is another agent that can cause gastric mucosal lesion. It rapidly penetrates the gastroduodenal mucosa causing membrane damage, exfoliation of cells, and erosion (Szabo S et al., 1985). Corticosteroids in high dose and with repeated use have been implicated in promoting ulcers. Personality and psychologic stress are important contribution factor as well (Feldman et al., 1992).

Generally, there are multiple lesions located mainly in the stomach and occasionally in the duodenum. They range in depth from more shedding of the superficial epithelium (erosion) to deeper lesions that involve the entire mucosal thickness (ulceration).

Gastric ulceration is resulted from the imbalance between gastrotoxic agents and protective mechanisms results in an acute inflammation. The interleukin-1 beta (IL-1 β) and tumor necrosis factor alpha (TNF α) are major proinflammatory cytokines, playing important role in production of acute inflammation (Konturek P Ch et al., 2000). This acute inflammation is accompanied by neutrophils infiltration of gastric mucosa (Kwiecien S et al., 2002).

The symptoms of gastric ulcer usually are stomachache located lower diaphragm and correlated with meal such as before or after meals, dyspepsia. Chronic gastric ulcer may be presented bleeding from ulcer, melena, weight loss, and anemia.

The management of gastric ulcer may include dietary therapy, abstinence of alcohol, no cigarette smoking, no spicy foods, and anti-acid therapy such as antacids, cytoprotective drug, H₂ blocker or proton pump inhibitors.

Aloe plants have been used medicinally for centuries. Among them, *Aloe barbadensis*, commonly called *Aloe vera*, has been one of the most widely used healing plants in the history of mankind (Eun-Joung Moon et al., 1999).

Two distinct preparation of Aloe plants are most used medicinally. The leaf exudate (name aloe) is used as a laxative , and the mucilaginous gel (name *Aloe vera*) from the leaf parenchyma is used as a remedy against a variety of skin disorders (Capasso and Gaginella, 1997). Aloe leaf exudate also possesses antidiabetic (Ghannam et al., 1986) and cardiac stimulatory activity (Yagi et al., 1982).

Aloe vera is one of the few substances known to effectively decrease inflammation and promote wound healing (Davis RH et al., 1989, Parish LC et al., 1991). *Aloe vera* gel could promote the healing of burns and other cutaneous injuries and ulcer (Klein AD et al., 1988 ; Lushbaugh CC et al., 1953). *Aloe vera* gel improved wound healing in a dose-dependent fashion, reduced edema and pain (Davis et al., 1989).

Aloe vera gel has been demonstrated to protect and/or cure gastric ulcer in both human (Blitz et al., 1963, Bovik, 1966, Gjerstad and Riner, 1968) and rats (Mahattanadul, 1996, Galal et al., 1975, Kandil and Gobran, 1982, La-ongphanich, 1987, Robert et al., 1979, Maze et al., 1997, Suvitayavat et al., 1997). This antiulcer activity has been proposed to be due to anti-inflammatory (Robert et al., 1979), cytoprotective (Mahattanadul, 1996), healing (Robert et al., 1979; Teradaira et al., 1993) and mucus stimulatory effects (Visuthipanich, 1988).

However, the effects of *Aloe vera* on gastric microcirculation, inflammatory cytokines in gastric ulcer have not yet been reported.

Therefore, the objectives of this study are the comparative study between effects of *Aloe vera* and Sucralfate on gastric microcirculatory changes, cytokines production, and gastric ulcer healing.