The medical management of a peptic ulcer includes the use of antacids to aid in the healing of ulcer as well as to relieve the pain or discomfort associated with peptic ulcer. Other uses of antacids are in the treatment of gastritis, food indiscretions, gastric distress, and discomfort associated with vague causes.

Nonsystemic antacids are more often prescribed than the systemic antacids. The liquid dosage form is generally better than the solid dosage form.

Aluminium hydroxide, which is a nonsystemic antacid, suffers from many disadvantages as a sole ingredient for antacid product. It is a relatively weak antacid and does not elevate gastric pH sufficiently to inhibit pepsin activity. Dried Al(OH)₃ requires a definite swelling period before it is ready to bind with hydrogen ions. In addition to this it is a heat sensitive substance. On the other hand magnesium hydroxide, another nonsystemic antacid, is a powerful antacid material. The neutralization capacity of magnesium hydroxide exceeds that of aluminium hydroxide gel. Moreover it is the most rapidly reacting antacid.
The present study is aimed at the preparation and evaluation of magnesium hydroxide suspensions. Aqueous magnesium hydroxide suspension is official in many pharmacopoeias. Aqueous magnesium hydroxide suspension is expected to cause acid rebound because the stomach contents are buffered at about pH 8. An attempt is made to control the maximum pH at about 5 by formulating magnesium hydroxide in the form of an oily suspension and granules.

Formulated antacids were evaluated by a modified U.S.P. acid-consuming test and by the Rossett-Rice test. These tests were used to evaluate antacid formulations as they attempt to simulate in vivo conditions.

The relationship between the time and pH is non-linear in the Rossett-Rice test. A linear relationship is obtained by plotting $1/(TMEQ-NxRxT)$ versus log pH. A mathematical equation is proposed to compute the values of pH at different times in the Rossett-Rice test. A highly significant correlation is obtained between the observed pH and the calculated pH. The proposed equation was further tested for oily suspensions, market products containing the mixture of aluminium hydroxide gel and magnesium hydroxide, emulsions and granules.
The time required to analyze antacid samples can be reduced by terminating the Rossett-Rice test earlier. The proposed equation can be helpful to the researchers to test (total time of action, effect of adjuvants, and the area under the curve of time versus pH) numerous formulations in reasonably short period. The time required for data processing is reduced by the use of a computer.

The proposed equation can also be helpful in fixing the dosage regimen for patients suffering from peptic ulcers. The variables like milliequivalent of an antacid, normality of hydrochloric acid, and the rate of addition of hydrochloric acid are included in the equation to facilitate its use in patients with different degree of acidity and also in patients receiving different antacid products.

Olive oil, saffola oil, and arachis oil were tested for antiulcer activity in pylorus-ligated rat. These oils possess some protective action against ulcer formation. Oily antacid suspensions were prepared using these oils. From above findings, it is expected that the oily suspensions will possess better protective effect. In oily suspensions, the maximum pH was controlled to less than 6 in the Rossett-Rice test. It is predicted that the oily suspensions containing magnesium hydroxide can be used to control acid rebound.
Selected formulations were tested in pylorus-ligated rat to find out the correlation if one exists between the in vitro and in vivo tests.

The effects of concomitantly administered drugs on the neutralization behaviour of antacids was assessed with a view to detect any alterations in the action of antacids.

The entire work has been divided into the following sections:

Section I gives a brief introduction to peptic ulcer, its treatment, and review of work done.

Section II deals with the experimental work, which is subdivided as follows:

(a) Preparation and evaluation of aqueous suspensions containing magnesium hydroxide.

(b) Study of market products containing aluminium hydroxide gel and magnesium hydroxide.

(c) Testing of olive oil, saffola oil, and arachis oil for antiulcer activity in pylorus-ligated rat.
(d) Preparation and evaluation of oily suspensions containing magnesium hydroxide.

(e) Study on aqueous suspensions containing coated magnesium hydroxide particles.

(f) Preparation and evaluation of granules containing magnesium hydroxide.

(g) Testing efficiency of antacids in the presence of selected drugs.

(h) Testing of selected products in pylorus-ligated rat.

Section III deals with the general discussion leading to conclusion and summary.