Male white rats of the Wistar breed were used in this study to investigate and compare the effectiveness of some of the drugs used for the treatment of peptic Ulcer as they inhibit HCl secretion in the stomach. These drugs are cimetidine and ranitidine ( anti histamine receptor antagonists) and omeprazole ( proton pump inhibitor) which were injected intravenously after stimulation of acid secretion by electrical vagotomized stimulation. Ranitidine and omeprazole were found to be significantly more effective in inhibiting HCl secretion than cimetidine, but no significant difference was found between ranitidine and omeprazole in their effect on the acid secretion. The stimulatory effect of caffeine, histamine and nicotine on gastric acid secretion in rats was also investigated in the present study. Each of these drugs caused significant increase in the gastric acid secretion compared to the basal acid secretion, but histamine was the most potent stimulation. These results indicate the danger of excessive use of these drugs, particularly by patients with peptic ulcer.