CHAPTER

VI

SUMMARY

1. The present study was undertaken to confirm the anti-ulcerogenic action of Tamrabhasma (TABH), a traditional preparation of copper advocated in Ayurveda for acid pepsin disease. The experimental models of gastric and duodenal ulcers were induced in albino rats.

2. The effectiveness of TABH was compared with clinically used drugs like cimetidine, carbenoxolone and combination thereof in the management of duodenal and gastric ulcers.

3. In rats gastric ulcers were induced by dexamethasone or indomethacin and duodenal ulcers by cysteamine.

4. Dexamethasone (8 mg/kg s.c.) administered to fasted rats for 4 days produced severe gastric ulcers.

5. Indomethacin (20 mg/kg s.c. suspended in a trace of tween 80) produced severe lesions in the stomach within 18 hours of administration.

6. Cysteamine in single dose (300 mg/kg s.c.) produced severe duodenal ulcers within 18 hours of administration.

7. Compared to vehicle treated control TABH in all doses (1 mg/kg to 120 mg/kg p.o. 4 days) had significant protective effect against dexamethasone-induced gastric ulcers. TABH 60 mg/kg produced maximum protective effect.

8. TABH was effective only when administered after ulceration induced by dexamethasone. TABH administered before or simultaneously alongwith dexamethasone had no significant protective effect suggesting that TABH has more curative action than protective.

9. TABH (60 mg/kg) perse administered for 4 days or 10 days had no significant effect of volume, total acidity, pepsin activity, protein and various carbohydrate contents of the gastric juice. TABH produced significant effect only after induction of ulcer.

10. TABH (60 mg/kg p.o.) treatment for 4 days caused significant decrease in the ulcer index affording 55 to 60% protection against dexamethasone or indomethacin induced gastric and cysteamine induced duodenal ulcer. TABH treatment (60 mg/kg p.o.) for 10 days produced 80 to 83% protection.

11. Carbenoxolone (30 mg/kg p.o.) treatment for 4 days produced 80 to 83% protection which was equivalent to TABH treatment for 10 days. Cimetidine (20 mg/kg p.o.) treatment for 4 days afforded 55 to 60% protection in all the three experimental ulcer models.

12. Combination of TABH (60 mg/kg) with 50% dose of carbenoxolone (15 mg/kg) administered for 4 days produced 81% protection. Similar combination of TABH (60 mg/kg) with 50% dose of cimetidine (10 mg/kg) produced better effect than cimetidine (20 mg/kg) alone after dexamethasone or indomethacin or cysteamine administration.

13. Dexamethasone or indomethacin both had no significant effect on gastric juice volume. Total acidity and pepsin activity were significantly increased after indomethacin whereas dexamethasone had no significant action on these parameters.

14. Cysteamine caused significant decrease in the gastric juice volume and increase in the total acidity without affecting peptic activity.

15. TABH (60 mg/kg p.o. 4 days or 10 days) caused significant decrease in the volume, total acidity and pepsin activity. Thus all three offensive factors were affected.

16. Carbenoxolone (30 mg/kg p.o. 4 days) had no effect on volume and total acidity of the gastric juice but caused significant decrease in pepsin activity in all experimental models in our study.

17. Cimetidine (20 mg/kg p.o. 4 days) produced maximum effect on volume, total acidity and pepsin activity, which was more than TABH (60 mg/kg) administered for 4 days or 10 days or carbenoxolone administered alone.

18. Dexamethasone or indomethacin both produced significant decrease in carbohydrate to protein ratio with significant increase in the protein content of the gastric juice without affecting total carbohydrates or individual carbohydrate.

19. Cysteamine caused significant increase in the hexosamine content of the gastric juice without any significant change in total carbohydrates. Total protein content of the gastric juice was significantly increased leading to decrease in carbohydrate to protein ratio.

20. After dexamethasone or indomehtacin or cysteamine TABH (60 mg/kg p.o.) treatment for 4 or 10 days caused 2 to3 fold increase in the formation of the fucose and sialic acid. TABH also affected total hexoses without significant change in hexosamine of the gastric juice.

21. TABH caused significant decrease in the protein content of the gastric juice and significant increase in the total carbohydrates leading to increase in the carbohydrate to protein ratio.

22. Carbenoxolone (30 mg/kg) produced maximum changes in the mucus, causing 3 to 4 fold increase in sialic acid and fucose. It also increased total hexoses, and hexosamine and caused maximum decrease in total protein contents in all three experimental models leading to increase in carbohydrate to protein ratio.

23. Cimetidine 2o mg/kg did not produce any significant change in total or individual carbodhydrate contents of the gastric juice. However, it caused significant increase in carbohydrate to protein ratio by decreasing protein content of the gastric juice.

24. Combination of TABH (60 mg/kg) with 50% reduced dose of carbenoxlone (15 mg/kg) produced more effect on gastric mucus compared to cimetidine or TABH for 4 days or 10 days.

25. Cimetidine produced more effect after cysteamine-induced duodenal ulcer than after dexamethasone or indomethacin induced-gastric ulcer.

26. Dexamethasone and indomethacin caused increase in the epithelial cell loss compared to vehicle treated control. TABH (60 mg/kg p.o. 10 days) caused significant decrease in the epithelial cell loss.

27. Chronic treatment with TABH (120 mg/kg p.o.) for 30 days produced no observed haematological or biochemical side effects.

28. The antiulcerogenic action of TABH was confirmed by histopathological studies. Healing of the ulcers after TABH (60 mg/kg) treatment in the form of fibrosis, congested blood vessels, presence of inflammatory cells or regeneration could be seen in most of the sections. Increased PAS activity also suggested more mucus formation.

gastric juice, improved quality of mucus and hence increase in the efficiency of the mucus barrier. The increased fucose and sialic acid in the gastric juice may contribute towards its antiulcerogenic action.

30. TABH affects both offensive and defensive factors involved in ulceration and possesses distinct antiulcerogenic action. Cimetidine and carbenoxolone usually affected only offensive and defensive factors respectively.

31. TABH or cimetidine or carbenoxolone was found to be equally effective in gastric and duodenal ulcer induced by dexamethasone or indomethacin or cysteamine respectively.

32. Combination of TABH with cimetidine appeared to be more helpful in duodenal ulcer whereas similar combination with carbenoxolone appeared to be more helpful in gastric ulcer.

33. TABH may have cytoprotective action similar to prostaglandin and carbenoxolone by increasing synthesis of endogenous prostaglandins, although the efficacy is less than carbenoxolone.

34. TABH may affect the cAMP & prostaglandin system of parietal cell directly by increasing the prostaglandin synthesis or indirectly by forming a complex with ATP in the parietal cell and inhibit gastric acid secretion.