

EFFECT OF MEBARID ON GUINEA PIG ILEUM

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Received: 04 Feb 2013, Revised and Accepted: 28 Mar 2013

ABSTRACT

Mebarid is a well known anti-diarrhoeal Ayurvedic formulation. A study was conducted to evaluate the receptor level mechanisms of anti-diarrhoeal effect of Mebarid. Effect of Mebarid was tested on spontaneous contractions of isolated guinea pig ileum and contractions induced by acetylcholine, nicotine, and histamine in isolated guinea pig ileum. Mebarid decreased the spontaneous contractions of isolated guinea pig ileum and also inhibited the acetylcholine, nicotine and histamine induced contractions of isolated guinea pig ileum. It shows that anti-diarrhoeal activity of Mebarid may be through muscarinic, nicotinic and histamine receptors.

Keywords: Mebarid, Acetylcholine, Nicotine, Histamine.

INTRODUCTION

Diarrhoeal disease is a leading cause of mortality and morbidity in developing countries resulting in a major health care problem. Recurrent diarrhoea is prevalent in developing countries, particularly in tropical regions [1]. Vast majority of the people of the developing countries relies on herbal drugs for the management of diarrhoea, World Health Organization in Diarrhoeal Disease Control Programme has given a special emphasis on the use of traditional medicines in the control and management of diarrhoea [2, 3].

Mebarid syrup is an Ayurvedic formulation widely used for infantile diarrhoea & dysentery [4]. Present work was carried out to study the effect of Mebarid on spontaneous contractions of isolated guinea pig ileum and contractions induced by acetylcholine, nicotine, and histamine in isolated guinea pig ileum.

MATERIALS AND METHODS

Drugs

i) Mebarid Syrup – SG Phyto Pharma (P) Ltd., ii) Acetylcholine - Sigma Chemicals Ltd. iii) Nicotine - Sigma Chemicals Ltd. iv) Histamine - Sigma Chemicals Ltd.

Composition of Mebarid

Each 10 ml of Mebarid contains i) Ajmoda (100 mg), ii) Bael (100 mg), iii) Lodhara (100 mg), iv) Dadim (100 mg), v) Badishep (100 mg), vi) Daruhalahad (100 mg), vii) Jaiphal (50 mg), viii) Sunth (50 mg), ix) Ativish (50 mg), x) Kuda (50 mg), xi) Sugar (q.s.).

Animals

Guinea pigs (300 – 400 gm each) were obtained from VIPER, Pune. They were fed with commercially available standard feed. The

animals were housed under standard condition. Water was provided ad libitum. The Institutional Animal Ethical Committee of Government College of Pharmacy, Aurangabad, Maharashtra, India (GCPA/IAEC/2011/235, 11/03/2011), approved the study.

Effect of Mebarid on stimulant effect of Acetylcholine, Nicotine and Histamine in isolated guinea pig ileum.

Guinea pigs were killed by a cervical blow using an iron rod. The abdomen was opened and the caecum was identified. It was lifted forward and the ileum was found to be joined at its back. A piece of ileum was removed, cleaned and was placed in a petri dish containing Tyrode solution. A thread was attached to the top to serve as a marker. The perfusion fluid in petri dish was aerated and debris inside the lumen was washed gently with pipette. The mesenteric membrane was trimmed for a length of ileum of approximately 2 cm. Two threads were tied to the upper and lower portion of the gut. The thread tied to the lower portion was attached to the hook of the air-delivery tube inside the bottom of the chamber, in a water jacketed organ bath containing 10 ml Tyrode solution (composition in mM: NaCl 136.89, KCl 2.68, MgCl₂ 1.05, CaCl₂ 1.36, NaH₂PO₄ 0.32, NaHCO₃ 11.90 and glucose 5.55) and the thread tied to the upper portion of gut was attached to the force displacement transducer. Tissues were mounted under an initial load of 0.5 g and allowed to equilibrate for 30 min. before the addition of any drug. The experiments were performed at 37 °C and bubbled with a mixture of 95% oxygen and 5% carbon dioxide. Normal rhythmic motility was recorded on a student's physiograph (Bio-Device, Ambala – 134003) [5, 6, 7]. The effect of Mebarid (0.2 ml/ml) was tested on spontaneous contractions of guinea pig ileum induced by acetylcholine (1 μM), nicotine (2 μg/ml) and histamine (1 μg/ml). Each concentration tested was allowed a contact time of 1 min followed by washing three times. A resting period of 15 min was allowed before the next addition [8].

1: Effect of Mebarid with Acetylcholine, Nicotine and Histamine on guinea pig ileum

Group	Dose (/ml)	Effects on tissue	Contraction (gm)	Inhibition (%)
Normal			1.01 ± 0.03	
Mebarid	0.2 ml	Relaxation	0.41 ± 0.03**	59.40
Acetylcholine	1 μM	Contraction	2.36 ± 0.04***	
Mebarid + Acetylcholine	0.2 ml 1 μM	Relaxation	1.11 ± 0.03**	92.59
Nicotine	2 μg	Contraction	1.85 ± 0.04****	
Mebarid + Nicotine	0.2 ml 2 μg	Relaxation	1.15 ± 0.02**	83.33
Histamine	1 μg	Contraction	2.25 ± 0.04*	
Mebarid + Histamine	0.2 ml 1 μg	Relaxation	1.1 ± 0.02***	92.74

Values are mean ± S.E.M. (n=6). *p < 0.05, **p < 0.02, ***p < 0.01, ****p < 0.001 vs. normal; Student's t-test.

Statistics

The results of all experiments were reported as mean \pm S.E.M. Statistical analysis was carried out using Student's 't'-test. A level of significance of $P < 0.05$ was regarded as statistically significant.

RESULTS

Effect of Mebarid on stimulant effect of Acetylcholine, Nicotine, and Histamine in isolated guinea pig ileum.

Mebarid inhibited spontaneous contractions of guinea pig ileum. Addition of acetylcholine, nicotine and histamine to the bathing medium of the isolated guinea pig ileum increased the contractions of the tissue. Mebarid (dose 0.2 ml/ml) produced relaxation of guinea pig ileum by 59.40%. Mebarid (0.2 ml/ml) decreased stimulant effect of acetylcholine (1 μ M), nicotine (2 μ g/ml) and histamine (1 μ g/ml) on isolated guinea pig ileum by 92.59%, 83.33% and 92.74% respectively (Table 1).

CONCLUSION

Antidiarrhoeal effect of Mebarid may be through muscarinic, nicotinic and histamine receptors.

ACKNOWLEDGEMENTS

The authors express their gratitude to the Principal, Government College of Pharmacy, Aurangabad, for providing research facilities.

REFERENCES

1. Abdulkarim A, Sadiq Y, Garbiel OA, Abdulkadir U.Z., Ezzeldin M.A. Evaluation of five medicinal plants used in diarrhoea treatment in Nigeria. *Journal of Ethanopharmacology* 2005; 101: 27-30.
2. Gricilda SF, Molly T. Study of antidiarrhoeal activity of four medicinal plants in castor oil induced diarrhoea. *Journal of Ethanopharmacology* 2001; 76: 73-76.
3. Shamkuwar PB, Shahi SR.. Evaluation of antidiarrhoeal activity of mebarid: an ayurvedic formulation. *International Journal of Pharmacy and Pharmaceutical Sciences* 2012; 4(2): 714-716.
4. Shamkuwar PB. Additive effect of black pepper with Mebarid, an ayurvedic antidiarrhoeal formulation. . *International Journal of Pharmacy and Pharmaceutical Sciences* 2012; 4(3): 536-539.
5. Arul V, Miyakazi S, Dhanjayan R. Mechanisms of the contractile effect of the alcoholic extract of *Aegle marmelos* Corr. On isolated guinea pig ileum and tracheal chain. *Phytomedicine* 2004; 11: 679-683.
6. Attia HA, Samar MM. Antidiarrhoeal activity of some Egyptian medicinal plant extracts. *Journal of Ethanopharmacology* 2004; 92: 303-309.
7. Jing H, Wen-Yuan G, Ning-Sheng L, Chang-Xiao L. Antidiarrhoeal and intestinal modulatory activities of Wei-Chang-An-Wan extract. *Journal of Ethanopharmacology* 2009; 115: 450-455.
8. Shamkuwar PB. Antispasmodic herbal formulations. Lap Lambert Academic Publishing, Saarbrucken, Germany; 2013.
9. Mbagwu HC, Adeyemi OO. Antidiarrhoeal activity of the aqueous extract of *Mezoneuron Benthamianum* Baill (Caesalpiniaceae). *Journal of Ethanopharmacology* 2008; 116: 16-20.
10. Suleiman MM, Dzenda CA, Sani CA. Antidiarrhoeal activity of the methanol stem-bark extract of *Annona senegalensis* Pers. (Annonaceae). *Journal of Ethanopharmacology* 2008; 116: 125-130.