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Original Research Article

Effect of antihistaminics on amplitude of rabbit gut

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ABSTRACT

Background: The small intestine, like the rest of the gastrointestinal tract, is an intelligent organ. It generates a wide variety of motor patterns to meet motility requirements in different situations. Its basic motor function after a meal is to mix the chyme with exocrine and intestinal secretions, agitate its contents too.
Methods: In vitro study is done to explore the effect of 1st generation antihistaminic (chlorpheniramine maleate) and second generation antihistaminic (Fexofenadine) on amplitude of gut motility by isolated rabbit gut preparation on Dale's Organ bath, part of terminal ileum is used for study. Eight rabbits weighing 2 to 4.5 kg were used for study. The effect of antihistaminic observed that both drugs reduce amplitude.
Results: The effect of Chlorpheniramine malete and Fexofenadine on amplitude observed and it found that both decrease the amplitude significantly.
Conclusions: This study establishes a correlation between amplitude of gut and effect of antihistaminic suggests that antihistaminic drug both first generation and second generation decreases the amplitude of gut motility with a significant response.

Keywords: Amplitude, Antihistaminic drug, Chlorpheniramine maleate, Fexofenadine, Gut motility

INTRODUCTION

The small intestine, like the rest of the gastrointestinal tract, is an intelligent organ. It generates a wide variety of motor patterns to meet motility requirements in different situations. Its basic motor function after a meal is to mix the chyme with exocrine and intestinal secretions, agitate its contents too. Uniformly and evenly expose them to the mucosal surface and to propel them distally at a rate that allows optimal absorption of food components, and reabsorption of bile. Most of these functions are performed by individual phasic contractions. In humans, the phasic contractions are largely disorganized in time and space. These contractions may cause mixing and agitation of luminal contents with slow distal propulsion occasionally, an individual contraction of large amplitude and long duration migrates over several centimeters and may rapidly propel the contents over this distance.[1] In general, the spatial and temporal relationships of individual phasic contractions become less organized distally, resulting in a slower propulsion rate in the distal small intestine than in the proximal small intestine. The migrating clustered contractions generated after a meal may also be propulsive, but because of their unpredictable and irregular occurrence, their precise role in postprandial propulsion incompletely understood rapidly migrating contractions might occur when the electrical control activity obliterated by pharmacologic agents or during parasitic infections. Their effect yet not known on motility.[2]

METHODS

Ileum part of GIT of eight rabbits weighing 2 to 4.5 kg was use for study. The availability of the animals had done from the registered breeder. The animals individually housed in comfortable surroundings like to maintain temperature, humidity and light controlled room (12-hour light and 12-hour dark) in animal house in specific cages. The animal experiments performed in Department of Physiology B.R.D. Medical College Gorakhpur after obtaining animal ethical clearance from the Ethical committee of B.R.D. Medical College, Gorakhpur, Uttar Pradesh, India.

RESULTS

The effect of Chlorpheniramine malete and Fexofenadine on amplitude observed and it found that both decrease the amplitude significantly.

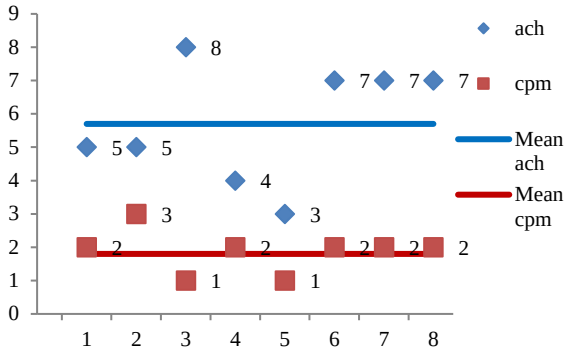

Figure 1: Comparison of amplitude between acetylcholine and chlorpheniramine.

The comparison of amplitude between Acetylcholine and Chlorpheniramine shows the max value of 8 and min of 3 after instillation of Acetylcholine while after instillation of Chlorpheniramine, max value is 3 and min is 1.

Table 1: Amplitude distribution of gut motility and comparison between acetylcholine and fexofenadine.

Serial no. of experiments	1	2	3	4	5	6	7	8	Mean
Acetylcholine amplitude (mm)	5	5	8	4	3	7	7	7	(5.75)
Fexofenadine amplitude (mm)	1	1	1	1	1	2	1	2	(1.25)

Table 2: Amplitude distribution of gut motility and comparison between fexofenadine and chlorpheniramine.

Serial no. of Experiments	1	2	3	4	5	6	7	8	Mean
fexofenadine amplitude (mm)	1	1	1	1	1	2	1	2	(1.25)
Chlorpheniramine amplitude (mm)	2	3	1	2	1	2	2	2	(1.80)

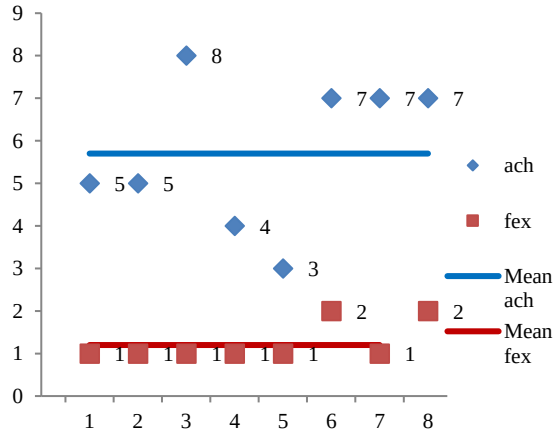

Figure 2: Comparison of amplitude between acetylcholine and fexofenadine.

The comparison of amplitude between Acetylcholine and fexofenadine shows the max value of 8 and min of 3 with Acetylcholine and after instillation of fexofenadine max value is 2 and min is 1.

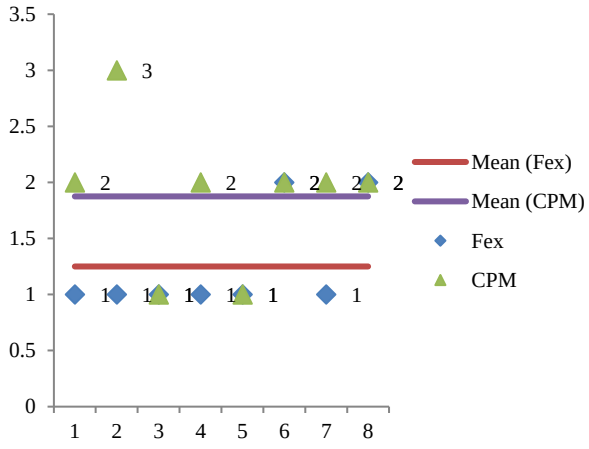

Figure 3: Comparison of amplitude between fexofenadine and chlorpheniramine.

The comparison of amplitude between Fexofenadine and Chlorpheniramine shows the max value of 2 and min of 1 with fexofenadine and with Chlorpheniramine, max value is 3 and min is 1.

DISCUSSION

As far as amplitude was concerned, observations were made between Ach and CPM and a mean increase of 5.75 was observed with Ach which after CPM instillation decreased with a mean of 1.8 Upon Ach instillation, mean value of 5.75 was observed which after Fexofenadine instillation decreased with a mean of 1.25. Statistically using unpaired t-test, the antagonism with CPM on amplitude was significant P value (0.02) and the antagonism with Fexofenadine was significant P value (0.004). Findings in this study are in a good agreement with that reported in the past. As reported in this paper, the effect of CPM and Fexofenadine on amplitude is observed and it is found that both decrease the amplitude significantly. The effect of both drugs on amplitude of the segmental movements of the isolated rabbit gut are recorded, in which a significant decrease with both drugs on all the three parameters is observed although first generation are the oldest H1-antihistaminergic drugs.[3]

They are effective in the relief of allergic symptoms, but are typically moderately to highly potent muscarinic acetylcholine receptor (anticholinergic) antagonists as well.[4] Thus from the present study we can safely conclude that both 1st and 2nd generation antihistaminics exhibits antimuscarinc properties as both have significant effect on muscarinic receptor but respectively second generation antihistamines have less antimuscarinic effect compared to first generation.[5]This selectivity significantly reduces the occurrence of adverse drug reactions, such as sedation, while still providing effective relief of allergic conditions but to reach on any conclusion there is a need of further elaborated studies on all these aspects and this may be our future research direction.

CONCLUSION

This study establishes a correlation between amplitude of gut and effect of antihistaminic suggests that antihistaminic drug both first generation and second generation decreases the amplitude of gut motility with a significant response.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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