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Research Article

PROTECTIVE EFFECT OF GARLIC IN INDOMETHCIN INDUCED GASTRIC ULCER IN ADULT ALBINO RATS

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INTRODUCTION:

- Peptic ulcer disease (PUD) is defined as the mucosal lesions that penetrate the muscularis mucosa layer and form a cavity surrounded by acute and chronic inflammation. Gastric ulcers are located in the stomach, often along the lesser curvature in the transition zone from corpus to antral mucosa[1]. Peptic ulcer disease has a tremendous effect on morbidity and mortality of patients[2]. Peptic ulcers are produced due to an imbalance between aggressive and defensive factors in stomach. Such factors could range from natural causes like gastric cancer, infections (Helicobacter pylori) and lifestyle factors like NSAIDS, alcohol, stress, and cigarette smoking. Garlic has antihypercholesterolemia, anti-inflammatory and antioxidant activity. In a clinical trial, the treatment of raw garlic inhibited *Helicobacter pylori* in the stomach of patients with H.pylori infection. Major cause of peptic ulcer disease is the use of NSAIDS, group of medication used to relieve pain. NSAIDS can wear away the mucus layer in the digestive tract. Upto 30% of adult patients taking NSAIDs experience gastrointestinal side effects[8]. Garlic has antihypercholesterolemia, anti-inflammatory and antioxidant

activity.Aged garlic extract (AGE) is considered an important source of phytochemicals that possess antioxidant activity. These include lipid soluble organosulfur compounds, water soluble organosulfur compounds (e.g S-allylcysteine (SAC) and S-allylmercaptocysteine), flavonoids and phenolic compounds, which play an important role in scavenging free radicals. Dietary consumption of garlic and garlic-based supplements have beneficial effect on digestive system.

AIMS & OBJECTIVES:

- To study the protective effect of garlic in indomethacin induced gastric ulcer in adult albino rats.

METHODOLODY:

The study was conducted on a total of 21 adult Albino rats weighing 150-200 grams in the Department of Anatomy, Gmc Srinagar after obtaining ethical clearance .

GROUP A served as Control Group. This group received standard diet with distilled water for 18 weeks. GROUP B was administered Garlic 200mg/kg body weight per orally dissolved in distilled water on daily basis for 18 weeks. The study was conducted for 18 weeks with the sacrifice of one rat from each group at an interval of two weeks. Before sacrificing the rats, they were kept in fasting state for 24 hours and then indomethacin 100mg/kg was given 6 to 8 hours prior to sacrifice to induce ulcer and then gross and histopathological study was done to see the protective effect of garlic. One animal from each group was sacrificed at 6th, 8th, 10th, 12th, 14th, 16th and 18th week respectively. The animals were sacrificed by chloroform inhalation, as per the guidelines laid down by the "Committee for Purpose of Control and Supervision of Experiment on Animals" (CPCSEA). After sacrificing, the rats were dissected.

RESULTS:

Group A: On gross examination, the mucosa appeared reddish and thin. On dissection, it was found that indomethacin administration to fasted rats showed denuded mucosa and few linear hemorrhagic mucosal lesions. On microscopic examination, little distortion was seen in the stomach architecture. Mucous membrane with lamina propria and muscularis mucosa shown mild denudation.

Group B: Grossly the mucosa of stomach was intact. The structure of stomach in garlic group showed denudation of epithelium with very few hemorrhagic lesions. On microscopic examination, the mucous membrane consisting of lining epithelium was intact. Rows of columnar cells in stomach mucosa

were seen. The mucosa of the stomach was intact.

AT 8TH WEEK:

Group A: The fasted rats in which indomethacin administration was given showed various mucosal erosions and hemorrhagic lesions. On microscopic examination, mild distortion was seen in the submucosa and muscularis externa. Mucosa showed mild mucosal erosions.

Group B: The stomach of garlic group showed few mucosal erosions with no pus. On microscopic examination, the stomach mucosa was intact with no erosions. Rows of columnar cells and gastric pits were normal. The muscularis mucosa with longitudinal and circular muscles was found to be normal. Submucosa and muscularis externa was normal.

AT 12TH WEEK:

Group A: The stomach of indomethacin administered of fasted rats showed gross hemorrhagic mucosal lesions with abnormal bleeding. On histological examination, the mucosa was denuded with distorted stomach architecture. Few mucosal ulcers were seen.

Group B: The mucosa of rats administered with garlic showed no hemorrhage or mucosal erosions. Microscopic examination revealed normal stomach architecture. Mucous membrane consisting of lining epithelium, supported by lamina propria and muscularis mucosa was found to be intact.

AT 14TH WEEK:

Group A: It was found that indomethacin administration to fasted rats induced gross linear hemorrhagic mucosal lesions. Pus filled peritoneal cavity was seen. Light microscopic study revealed signs of superficial broad-based ulcer with sharp margins and a clean base.

Group B: Garlic group showed stomach with no bleeding, ulcers or pathology. Intact mucosal lining was seen throughout. On histological examination, the lining epithelium of mucosa was intact. Muscularis mucosa was found to be normal. The gastric pits were normal with normal goblet cells Submucosa with loose areolar tissue was intact. Muscularis externa and serosa was normal.

AT 16TH WEEK:

Group A: It was found that indomethacin administration to fasted rats induced gross linear hemorrhagic mucosal lesions. Pus filled peritoneal cavity was seen. Light microscopic study revealed signs of superficial broad-based ulcer with sharp margins and a clean base. Mucosal ulcer with base covered by fibrinoid debris and underlying granulation tissue was also seen.

Group B: The macroscopic structure of stomach in garlic group appeared normal with no bleeding, ulceration or pathology seen. Light microscopy revealed that the architecture of the stomach was found normal. Stomach showed rows of columnar cells forming numerous gastric pits. Intact mucosal lining was seen throughout

with focal submucosal vascular congestion.

AT 18TH WEEK:

Gross and Microscopic changes:

1) Gross appearance:

a) Group A (control)

On dissection, it was found that indomethacin administration to fasted rats induced gross linear hemorrhagic mucosal lesions.

b) Group b (Garlic group)

The macroscopic structure of stomach in garlic group appeared normal with no bleeding, ulceration or pathology seen

Microscopic study showed:

a) Group A (control)

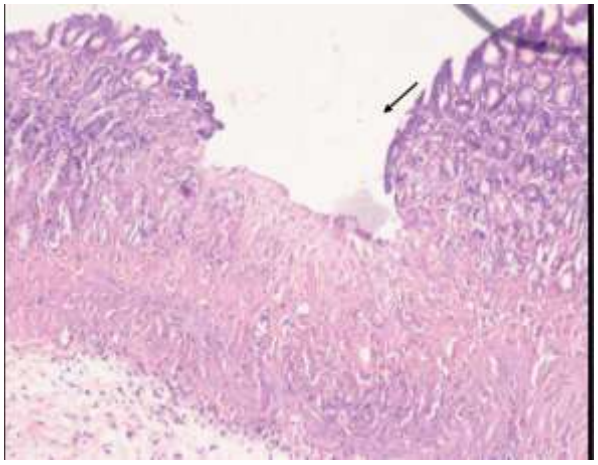
Light microscopic study revealed ulcer undermining the surrounding mucosa. The base is shaggy covered by granulation tissue and necrotic debris.

b) Group b (Garlic group)

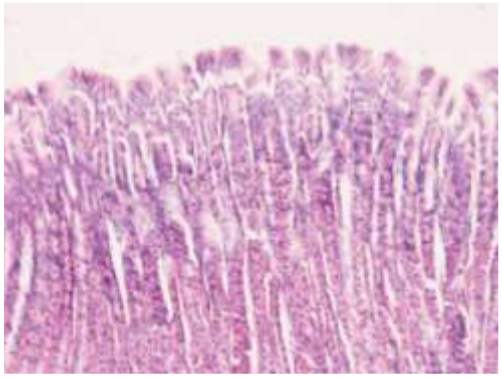
The architecture of the stomach was found normal. Stomach showed rows of columnar cells forming numerous gastric pits. Intact mucosal lining was seen throughout.

Macroscopic view of Stomach of Control group showing linear hemorrhagic lesions

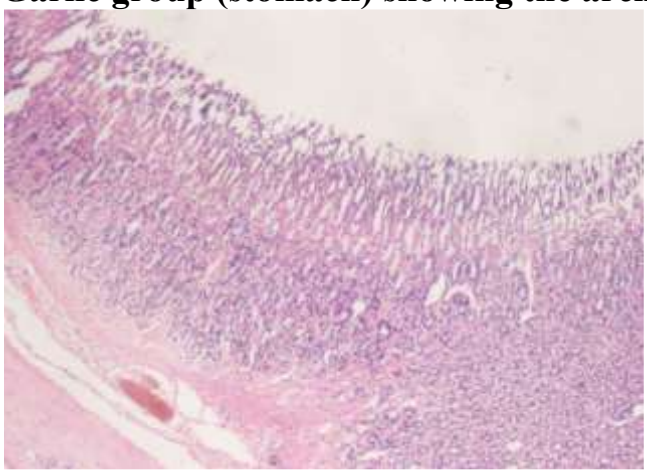
Macroscopic view of dissected stomach of Garlic group showing intact mucosa



Control group (stomach) showing superficial broad based ulcer with sharp heaped margins and a clean base.



Garlic group (stomach) showing the architecture of stomach found normal.



Garlic group showing no histological evidence of mucosal ulceration. Focal submucosal vascular congestion seen

CONCLUSION:

The present study was conducted to evaluate the protective effect of garlic on indomethacin induced gastric ulcer. The gross morphology of stomach of control group in the earlier weeks showed less changes with intact mucosa in few specimens. However few specimens showed pus filled peritoneal cavity. Garlic helped in maintaining the gastric mucosa homeostasis by keeping a balance between aggressive and defensive factors of stomach. Garlic could be used as prophylactic therapy for patients who have high tendency of gastric ulceration.

REFERENCES:

1.Najm WI. Peptic Ulcer Disease. Prim care. Clinics in Office Practice. 2011Sep;38 (3):383-394.

2. Malfertheiner P, Chan FK, McColl KE. Peptic Ulcer Disease. The Lancet.2009 Oct;374 (9699):1449-1461.

3. Chornenka ZA, Yasinska ET, Grytsiuk MI. Effect of prolonged and intermittent treatment on clinical course of peptic ulcer. Wiad Lek.2018;71:128-134.

4. Abbas AM and Sakr HF. Effect of selenium and grape seed extract on indomethacin-induced gastric ulcers in rats. J Physiol Biochem. 2013 Sep; 69(3): 527-537.

5. Yuan Y, Padol IT, Hunt RH. Peptic ulcer disease today. Nat Clin Pract Gastroenterol Hepatol. 2006 Feb;3(2):80-9.

6. Harrison A.R, Elashoff JD, Grossman M.I. Cigarette smoking and peptic ulcer disease. Smoking and Health, A Report of the Surgeon General. DHEW publication 1979;9.3-9.21.

7. Jaffe J.H , Gilman A.G, Goodman L.S, Rall T.W, Murad F. The Pharmacological Basis of Therapeutics. Macmillan.1985;531-581.

8. Roth S H, Bennett R E. Non-steroidal anti-inflammatory drug gastropathy. Arch Intern Med.1987 Dec;147(12):2093-100

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