

THERAPEUTIC EFFECT OF SPIRULINA VERSUS PLATELET-RICH PLASMA ON INDOMETHACIN-INDUCED GASTRIC ULCER IN BLACK MICE

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INTRODUCTION

Gastric ulcers are considered among the most important and prevalent gastrointestinal disorders nowadays. Gastric ulcer is as a lesion in the gastric mucosa that may extend to reach the muscularis mucosa. One of the most common inducing factors is non-steroidal anti-inflammatory drugs (NSAIDs). Indomethacin is a typical NSAID known for its anti-inflammatory, analgesic, and antipyretic properties but it has a higher ulcerogenic potential on the stomach compared to other NSAIDs. The majority of gastric ulcer treatments currently available are expensive, having high risk of ulcer recurrence and side effects. That's why we are continuously looking for natural alternatives that are safer, less expensive and more effective against gastric ulcers. PRP is a blood product rich in growth factors that enhances tissue regeneration and repair. Spirulina is a natural dried alga having a lot of vitamins, proteins and antioxidants which promotes healing in many organs.

AIM OF THE WORK

The current study was conducted to evaluate and compare the potential therapeutic role of PRP versus Spirulina in treating indomethacin-induced gastric ulcer in adult male black mice.

MATERIAL AND METHODS

This study was carried on sixty-one adult male black mice, obtained from the animal house center of physiology department, faculty of medicine, Alexandria University.

The Mice were Divided Into:

- Five healthy male black mice (weighing about 35 ± 10 g), to obtain the PRP.
- Fifty-six male black mice (weighing about 35 ± 5 g) were considered as the experimental group and further divided into four groups:

Group I (Control Groups): This group included 32 mice; they were subdivided equally into 4 subgroups (each containing 8 mice).

Subgroup Ia: received saline orally by intragastricgavage for 10 consecutive days.

Subgroup Ib: received a single oral dose of 0.5 ml of 0.25% carboxymethylcellulose by intragastricgavage. (the mice of this group were sacrificed after 6 hours).

Subgroup Ic: received Spirulina at a dose of 1000 mg/kg/ day dissolved in phosphate buffered saline orally by intragastricgavage for 10 consecutive days.

Subgroup Id: received PRP at a dose of 0.5 ml/kg/ day by subcutaneous injection for 10 consecutive days.

Group II (Indomethacin Induced Gastric Ulcer): included 8 mice, each received a single oral dose of indomethacin at a dose of 100 mg/kg dissolved in 0.25% carboxymethylcellulose using an intragastricgavage. (The mice of this group were sacrificed after 6 hours)

Group III (Gastric Ulcer+Spirulina): included 8 mice, each received a single oral dose of indomethacin as group II on the 1st day, then Spirulina was given at a dose of 1000 mg/kg/ day dissolved in phosphate buffered saline orally by gastric tube for 10 consecutive days from day 2 till day 11.

Group IV (Gastric Ulcer+PRP): included 8 mice each received a single oral dose of indomethacin as group II on the 1st day, then PRP was given at a dose of 0.5 ml/kg/ day by subcutaneous injection for 10 consecutive days from day 2 till day 11.

On the 12th day of the study, mice were sacrificed by neck dislocation and the fundus portion of stomach specimens were dissected, opened along the greater curvature and processed for gross morphological, histological by light and scanning electron microscope and morphometric examinations.

RESULTS

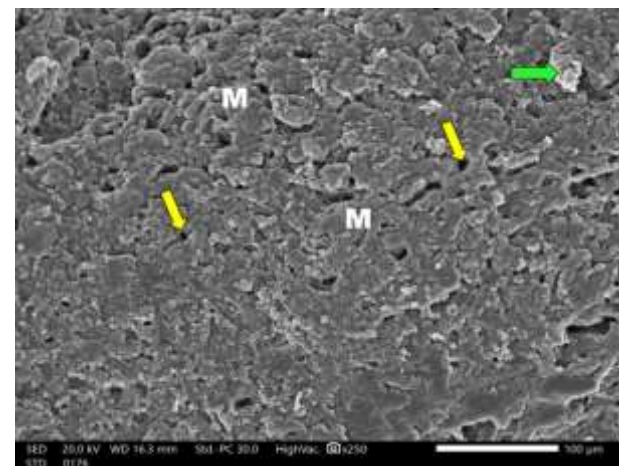


Figure1: A scanning electron photomicrograph of the fundus of stomach of control groups showing narrow gastric pits (yellow arrows) surrounded by surface mucous cells (M). Green arrow; mucous plug.



Figure2: A scanning electron photomicrograph of the fundus of stomach of group II (indomethacin group) showing a mucosal ulcer (U) surrounded by honeycomb mucosa (H) and abnormal surface epithelium (M).

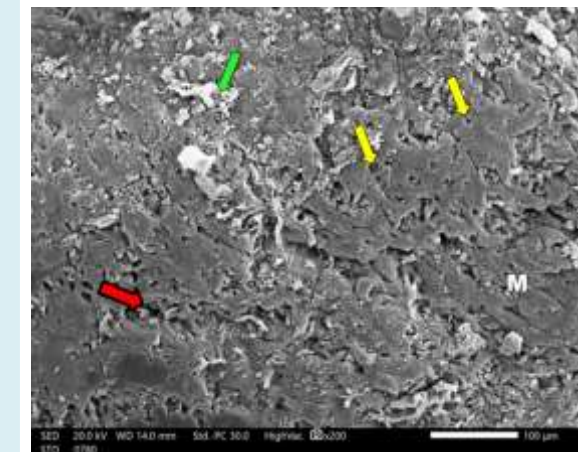


Figure3: A scanning electron photomicrograph of the fundus of stomach of group III (Spirulina treated group) showing intact surface mucosa with narrow gastric pits (yellow arrows) and normally appearing surface epithelial cells (M) that are covered by many mucous plugs (green arrow). Only few gastric pits are moderately dilated (red arrow).

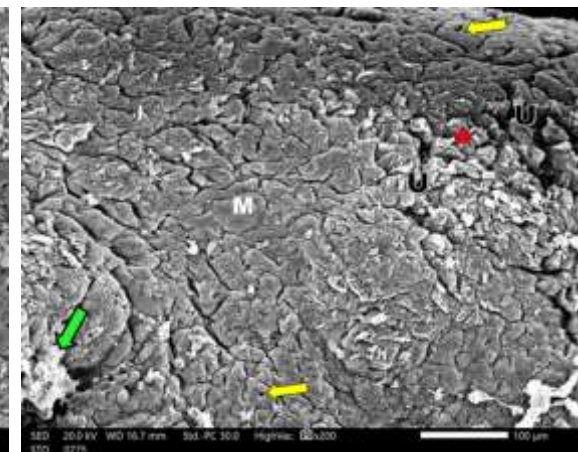


Figure4: A scanning electron photomicrograph of the fundus of stomach of group IV (PRP treated group) showing focal area of ulcers (U) and abnormal surface epithelium (red star) and scarce mucous plugs (green arrow). Otherwise, most surface mucous cells appear normal (M). Narrow gastric pits (yellow arrows) are noted.

CONCLUSION

The Present Work Revealed The Following:

- Both Spirulina and PRP seem to have therapeutic effects on the gastric mucosa. But Spirulina revealed better results in treating gastric ulcers and lesions and restoring the normal gastric mucosa.
- Concomitant use of Spirulina with Indomethacin helps to preserve the gastric tissue.