SHORT REPORT

Effect of a Short Course of Indomethacin on Gastric Mucosal Blood Flow using Endoscopic Laser-Doppler Velocimetry

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Abstract

Objective: To assess the effect of a short course of indomethacin on gastric mucosal blood flow (GMBF).

Methods: Patients with musculo-skeletal pain of recent origin and who were prescribed a short course of therapy with indomethacin (25 mg tid for 7 days) were studied. Baseline measurements of GMBF were carried out using endoscopic laser-Doppler velocimetry prior to starting indomethacin. At sites on the antrum, incisura, lesser and greater curvatures, and fundus. GMBF measurements were repeated after indomethacin therapy, as above and also on sites of erosions, if any.

Results: Baseline GMBF at sites on the antrum, incisura, greater and lesser curvatures, and fundus were (mean) 8.6, 7.9, 8.8, 8.5 and 8.7 volts, respectively. Post-therapy values did not differ from the corresponding baseline values (8.7, 8.5, 8.6, 8.5 and 8.3 volts, respectively). However, ten of the 16 patients developed gastric mucosal erosions and the mean GMBF on these sites of erosion was significantly reduced (6.6±1.3 volts, p<0.05).

Conclusions: A short course of indomethacin therapy produces a patchy decrease in blood flow in the gastric mucosa and erosions were seen in these areas.

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Key words: Non steroidal anti-inflammatory drugs, Endoscopic laser doppler velocimetry.

Introduction

Non steroidal anti-inflammatory drugs (NSAID) are known to produce a wide variety of damage to the gastrointestinal tract (GIT); this includes erosions and ulcers in the stomach and duodenum and bleeding and perforation of these ulcers. 1,2 Though long-term use of NSAID has been shown to significantly reduce gastric mucosal blood flow (GMBF), 3 the effect of their short-term use on the same in otherwise normal subjects has not been adequately studied. We studied the effect of short-term use of indomethacin on GMBF.

Methods

Sixteen patients (10 men, 6 women; age 44±6.5 year) who were prescribed indomethacin for backache, muscular pain or ligament injury and who had no history of taking NSAID in the recent past were included in the study after obtaining informed written consent. These patients were non-smokers, non-alcoholic, non-diabetic, and non-hypertensive. The protocol of the study was approved by the Ethical Review Committee of our institution, and was in conformity with the guidelines of the Helsinki Declaration for Human Experimentation.

Upper gastrointestinal endoscopy was performed after an overnight fast and administration of intravenous butylscopolamine bromide (20 mg) and topical lidocaine viscous solution (10 mL of 2% solution). GMBF was measured through the endoscope by the procedure described by Kvernebo et al 4 with minor modifications. A laser-Doppler (perfusion monitor Periflux, PF-3, Perimed, Stockholm, Sweden) with an endoscopic fiberoptic probe (2.4 mm diameter) was used. The flowmeter output was recorded on a strip chart recorder (BBC, 120-SE; chart speed 6 cm/min) and expressed as volts (1 volt = 100 perfusion units). All the recordings were obtained at standardized settings. We had earlier found this technique to yield reproducible measurements of GMBF. 5 The endoscopist was kept unaware of the measurements obtained by separating the recording and computing devices with a partition.

GMBF was recorded at one site each on the antrum, incisura, greater and lesser curvatures (mid-body) and fundus. GMBF was measured again at all the above sites and on the areas of erosions, if any, after the patients had taken indomethacin 25 mg thrice a day for seven days.

The data are presented as mean ± SD and were analyzed for statistical significance using Student's t test.

Results

The baseline GMBF was similar at various sites in the stomach, being 8.6±0.6, 7.9±0.8, 8.8±0.6, 8.5±0.8 and
Ashley et al\textsuperscript{9} reported a significant decrease in GMBF to ulcerating sites following instillation of aspirin in mongrel dogs, with an increase in the GMBF in intervening areas. Studies in dogs\textsuperscript{10} and rats\textsuperscript{11} using intravenous indomethacin showed a significant reduction in GMBF. The deleterious effect on GMBF may thus be common to all NSAIDs, though certain NSAIDs are claimed to be relatively safe; the effect may be a direct result of their common pharmacological action of cyclooxygenase inhibition.

Thus, NSAID use for short or long duration may be associated with risk of gastric damage. A comparative study of the effect of commonly used NSAIDs in different doses and durations of therapy, on GMBF may help in an objective determination of their relative safety.

References