

# TREATMENT OF *HELICOBACTER PYLORI* (*H. PYLORI*) INFECTION IN CHILDREN: A PROSPECTIVE STUDY COMPARING TWO DIFFERENT THERAPEUTIC REGIMENS

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## ABSTRACT

During a period of 10 months from May to February 1995, 120 children (72 girls, 48 boys) with an age range of 4-16 years (mean age 10.87, S.D.±2.7) with chronic abdominal pain who had an abnormal endoscopy (gastroduodenal mucosal defect) and positive urease test were treated for *H. pylori*. Patients were treated randomly with either metronidazole and amoxicillin (double therapy, group A) or metronidazole, amoxicillin and bismuth subsalicylate (triple therapy, group B), each for two weeks. 6-8 weeks after completion of treatment, patients were re-evaluated by endoscopy and urease test. Endoscopy was normal in 75 cases (63%). Of the 45 cases with abnormal endoscopy, 37 patients (82%) were in group A and 8 patients (18%) in group B ( $p<0.001$ ). The urease test was positive in 44 cases (70%) of group A and 12 cases (20%) of group B ( $p<0.001$ ). It is concluded that double therapy is relatively ineffective in eradication of *H. pylori* and triple therapy is less effective in this area compared with reports from industrialized countries. This difference is most probably due to greater drug resistance in this part of the world.

**Keywords:** Chronic abdominal pain, children, endoscopy, urease test, *H. pylori*, antibiotic therapy.

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## INTRODUCTION

Since the identification of *H. pylori* by Marchal and Warren in 1983, different modalities of treatment for the eradication of this organism have been tried with different rates of success.<sup>1-7</sup> Currently the most effective modality is the combination of metronidazole, an oral antibiotic (amoxicillin or tetracycline) and bismuth subsalicylate (triple therapy) with a 90-95% success rate.<sup>8-10</sup> Children occasionally do not tolerate such a combination or fail to complete a full course of therapy due to various reasons. Therefore a regimen with fewer components and thus

lower side effects is more attractive in children. On the other hand, due to the frequent use of metronidazole and amoxicillin in children of developing areas, the rate of resistance of *H. pylori* to these medications may be greater.<sup>11-12</sup> This prospective study was carried out to establish the efficacy of different treatment regimens in this part of the world.

## PATIENTS AND METHODS

During a period of 10 months from May to February 1995, 120 children (72 girls and 48 boys) with an age

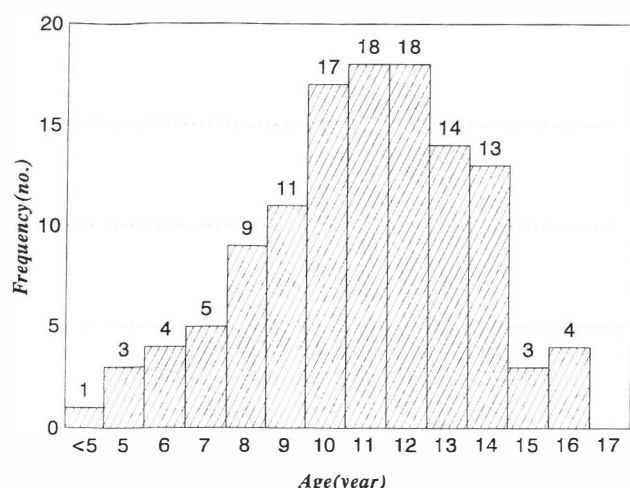


Fig. 1. Age distribution of patients studied.

range of 4-16 years (mean 10.87 years, S.D.  $\pm$  2.7) (Fig. 1) with chronic abdominal pain (defined as abdominal pain lasting for more than 3 months) and abnormal endoscopy (gastroduodenal mucosal defect) and positive rapid urease test (CLO test) were included in this study. Patients were treated for *H. pylori* by either double therapy (metronidazole and amoxicillin) or triple therapy (metronidazole, amoxicillin and bismuth subsalicylate) for two weeks with standard pediatric doses suggested for the treatment of *H. pylori*. 52 cases (group A) were treated with the double therapy regimen and 48 cases (group B) with the triple therapy regimen. The patients were assigned to each group randomly, matched for age, sex, clinical manifestations and endoscopic findings. In patients with duodenal ulcer, ranitidine was also added to the therapeutic regimen. 6-8 weeks after completion of the treatment course, re-endoscopy was performed to evaluate the rate of mucosal healing and possible change in the urease test. Before endoscopy, informed consent was obtained from all patients and parents. The procedure was successful in all cases without any complications. No sedation or general anesthesia was used. All endoscopies were performed by the same pediatric gastroenterologist, using an Olympus GIF P20 or XP20 endoscope.

## RESULTS

The age distribution and initial endoscopic findings of our series are shown in Figs. 1 and 2. Gastritis was the most common mucosal abnormality, and duodenal ulcer was present in 16% of the patients. In the post-therapy endoscopy, 75 patients (63%) had normal studies while 45 patients (37%) remained abnormal. Of those with abnormal endoscopies, 37 cases (82%) were in group A and 8 cases (18%) were in group B ( $p < 0.001$ ). In group A, 37 cases (60%) and in group B, 8 cases (14%) had abnormal endoscopies ( $p < 0.001$ ). The urease test was still positive

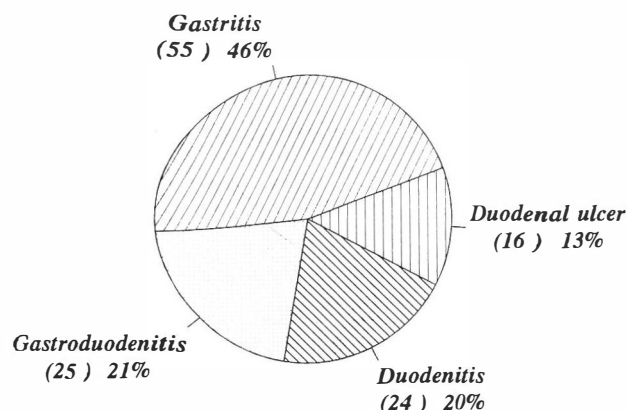


Fig. 2. Initial endoscopic findings of patients studied.

in 56 cases (47%), 44 (70%) from group A and 12 cases (20%) from group B ( $p < 0.001$ ). The rate of *H. pylori* eradication was about 30% by double therapy (group A) and about 80% by triple therapy (group B).

## DISCUSSION

The role of *H. pylori* in the pathogenesis of chronic gastritis and peptic ulcer is clearly known and the importance of treatment for eradication of this organism and healing of mucosal lesions and also prevention of recurrence of duodenal ulcer is also universally agreed upon.<sup>3,11-12</sup>

Ever since the identification of *H. pylori* in 1983 by Marshal and Warren, numerous studies have been performed on the efficacy of different regimens for the eradication of this organism.<sup>1-7</sup> The most effective regimen up to now is a combination of oral therapy with metronidazole, amoxicillin or tetracycline, and bismuth subsalicylate (triple therapy) for two weeks' duration with an up to 95% success rate.<sup>8-10</sup>

In the present series the success rate of triple therapy for *H. pylori* eradication was about 80%, which is lower than similar reports from industrialized countries. The lower rate of response in this series could be due to *H. pylori* resistance to the used medication, mainly metronidazole and amoxicillin, probably because of the frequent use of these medications in this area. Resistance of *H. pylori* to metronidazole has also been reported by others.<sup>11-12</sup> The success rate in the group taking double therapy was about 30% in our series, which was significantly lower ( $p < 0.001$ ) than the group taking triple therapy. The different types of gastroduodenal abnormalities seen in the present cases (Fig. 1) were similar to other reports on children with chronic abdominal pain from other areas.<sup>13-15</sup> It is concluded that: a) the types of gastroduodenal mucosal abnormalities in children with chronic abdominal pain in this area are similar to other

areas, with gastritis being the most common mucosal defect, b) endoscopy in children is a safe and effective diagnostic tool if performed in experienced hands, c) double therapy is not effective in the eradication of *H. pylori*, and d) triple therapy is less effective in this area than industrialized countries, most probably secondary to drug resistance caused by the frequent use of metronidazole and amoxicillin in children in this area.

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#### REFERENCES

1. Lewis JH: Update on management in the *H. pylori* era. Consultant January: 91-103, 1995.
2. Gryboski JD: Peptic ulcer disease in children. Pediatrics in Review 12 (1): 15-21, 1990.
3. Cerda JJ, Go MF: Peptic ulcer disease: now you can cure. Patient Care, December 15: 101-17, 1995.
4. Drumm B, Sherman P, Chiasson D: Treatment of *Campylobacter pylori* associated antral gastritis in children with bismuth subsalicylate and ampicillin. J Pediatr 113(5): 908-12, 1988.
5. Oderdo G, Vaira D, Halton J, et al: Amoxicillin plus tinidazole for *Campylobacter pylori* gastritis in children. Lancet 1 (8640): 690-2, 1989.
6. Oderdo G, Olio D, Morra I, et al: *Campylobacter pylori* gastritis: long term results of treatment with amoxicillin. Arch Dis Child 64(3): 326-9, 1989.
7. Bujanover Y, Konikoff F, Baratz M: Nodular gastritis and *H. pylori*. J Pediatr Gastroenterol Nutr 11(1): 41-4, 1990.
8. Lichtenstein DR: Peptic ulcer disease: clinical options for detecting and eradicating *H. pylori* infection. Modern Medicine 62: 41-8, 1994.
9. Mahony MJ, Wyatt JJ, Littlewood JM: Management and response to treatment of *H. pylori* gastritis. Arch Dis Child 67: 940-3, 1992.
10. Cerda JJ, Fowler FC: Fighting the fire: management and preventing peptic ulcer disease in the multi-risk patient. Modern Medicine 62: 40-9, 1994.
11. Walsh JH, Peterson WL: The treatment of *H. pylori* infection in the management of peptic ulcer disease. The New England Journal of Medicine 333(15): 984-9, 1995.
12. Crea JJ, Go MF: A revolution in peptic ulcer disease. Patient Care, May 15: 19-32, 1994.
13. Kato S, Nakagawa H, Harada Y: A clinical study of upper gastrointestinal endoscopy in Japanese children. Acta Pediatr Jpn 33(1): 36-42, 1991.
14. Kilbridge PM, Dahms BB, Czinn SJ: *Campylobacter pylori* associated gastritis and peptic ulcer disease in children. Am J Dis Child 142(11): 1149-52, 1988.
15. Tam PK, Saing H: Pediatric upper endoscopy: a 13 year experience. J Pediatr Surg 24(5): 443-7, 1989.

