Helicobacter pylori infection in Greenlandic patients with dyspepsia

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ABSTRACT

Objectives. The aim was to evaluate the incidence of Helicobacter pylori (HP) infection in Greenland, to assess the value of the test "Helicobacter antigen in faeces" as a diagnostic tool and to determine the level of antibiotic resistance. Study design. 100 consecutive patients with dyspepsia who visited for endoscopic gastric examination were included. The patients had to be born in Greenland and to be ≥ 18 years old. Methods. Samples for HP antibody in blood, HP antigen in faeces, urease test on biopsies were collected from the patients. Gastric biopsies were cultured for HP bacteria, and antibiotic resistance was tested. Patients with positive urease test and/or antigen in faeces and/or positive culture were treated simultaneously with Amoxicillin, Metronidazole and Esomeprazole for 1 week. Patients with duodenal or gastric ulcer were endoscopically re-examined 8 weeks later. Patients with proven HP infection but without ulcer submitted a faeces sample 8 weeks after the eradication. Results. 77 patients were considered HP infected, and received treatment. Only 32% of them were eradicated sufficiently. Conclusion. HP antigen in faeces test is useful as a diagnostic tool and for control of therapy. A change in strategy of HP treatment in Greenland is a must, presumably preceded by an elucidation of microbial sensitivity.

Keywords: Helicobacter pylori, antibiotic treatment, dyspepsia, Greenland.

INTRODUCTION

Infection with Helicobacter pylori (HP) is frequent in Greenland. Koch et al. (1) found that 58% and Milmann (2) found that 46% of adult Greenlanders were HP seropositive. HJ Fenger, however, found that only 50% of patients with duodenal ulcer were HP infected (3).

This study was planned to evaluate the incidence of HP infection among dyspeptic patients, to define the level of antibiotic resistance and to assess the value of the test Helicobacter antigen in faeces as a diagnostic tool. The purpose was to define an effective strategy concerning diagnosis and eradication of HP in Greenland.

METHODS AND RESULTS

100 consecutive patients with dyspepsia admitted for gastroscopy were included. The patients had to be born in Greenland and to be ≥ 18 years old. The patients included in the study fulfilled a questionnaire regarding: place of birth, age, sex, history of dyspepsia/ulcer and former or actual treatment with PPIs or HP eradication. In connection with the endoscopic examination the patients had a blood sample taken for determination of HP antibody and a faecal sample for determination HP antigen. Biopsies from the stomach were analysed with an urease test and sent for HP culture at Statens Serum Institut in Denmark.

The results of endoscopic examination were registered as follows: duodenal ulcer, gastric ulcer, prepyloric ulcer, gastroduodenitis, hiatus hernia with/without oesophagitis, and normal examination (Table I). Patients with positive urease test and/or HP antigen in faeces and/or a positive culture of HP were considered to have an infection with HP and were treated with Amoxicillin, Metronidazole and Esomeprazole for 1 week.
Second line treatment with Clarithromycin, Metronidazole and Esomeprazole for 1 week was used in patients who were previously eradicated as well as in patients who were allergic to penicillin.

Patients with duodenal or gastric ulcer were endoscopically re-examined 8 weeks later. Patients with proven HP infection but without ulcer submitted a faeces sample 8 weeks after eradication. If the patients still had a positive urease test or antigen in faeces a second line treatment was offered.

Eighty-seven per cent of the patients had at least one positive test. Ten per cent had antibodies as the only positive test. In these patients the infection may have subsided. Seventy-seven per cent of the patients were considered to have a current HP infection (positive HP antigen in faeces and/or positive urease test and/or positive HP culture) and they were given eradication therapy. With faeces antigen as a reference the specificity of serum antibodies was 33 %. Growth of HP was found in only 5 of 100 biopsies sent for cultivation. Currently 53 patients have submitted a second stool sample after the eradication therapy. Among them only 17 (32 %) were HP negative.

**DISCUSSION**

Among Greenlandic patients with dyspepsia the rate of infection with Helicobacter pylori (HP) is high. Culture of Helicobacter pylori was most often negative, presumably due to a low rate of bacterial survival during the long transportation time from Nuuk, Greenland to Statens Serum Institut, Denmark. HP antibodies may persist for months following eradication. Therefore, the specificity of the antibody test is low. In a huge and sparsely populated country such as Greenland, where referral for endoscopy may be difficult, stool antigen is useful as a diagnostic tool and for control of therapy. In patients subjected to endoscopic examination urease test may, however, be preferable due to its low cost together with a high specificity. The efficiency of current therapy is low. This may be due to lack of microbial sensitivity, low compliance, or a combination of these. A change in strategy of HP treatment is a must, preferably preceded by an elucidation of microbial sensitivity.

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**REFERENCES**

1. Koch A, Krause T, Krogfelt K, Rosing Olsen O, Melbye M. Forekomsten af HP infektion blandt grønlændere. Abstrakt, Nuna Med 2000.
2. Milman N, Byg KE, Andersen LP, Mulvad G, Pedersen HS, Bjerregaard P. Indigenous Greenlanders have a higher sero-prevalence of IgG antibodies to Helicobacter pylori than Danes. Int J Circumpolar Health 2003;62(1):54-60.
3. Fenger HJ, Gudmand-Hoyer E. Peptic ulcer in Greenland Inuit: evidence for a low prevalence of duodenal ulcer. Int J Circumpolar Health 1997; 56: 64-69.
4. Suerbaum S, Michetti P. Helicobacter pylori infection. N Engl J Med 2002;347(15):1175-86.

**Table I. Endoscopic findings in Helicobacter Pylori (HP) positive patients (N=100).**

|               | % Positive urease test | Positive HP antigen in faeces | Positive HP antibody | Positive HP culture |
|---------------|------------------------|-------------------------------|----------------------|---------------------|
| Gastric ulcer | 4                      | 2                             | 3                    | 4                   | 0                   |
| Duodenal ulcer| 7                      | 6                             | 4                    | 6                   | 0                   |
| Pyloric ulcer | 4                      | 4                             | 4                    | 4                   | 2                   |
| Gastritis     | 15                     | 13                            | 14                   | 11                  | 0                   |
| Reflux disease| 28                     | 27                            | 28                   | 28                  | 2                   |
| Normal        | 42                     | 27                            | 28                   | 28                  | 2                   |