Long-term follow up of patients with gastritis associated with *Helicobacter pylori* infection

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SUMMARY. The aim of this study was to evaluate the long-term prognosis for patients suffering from gastritis associated with Helicobacter pylori *infection, and in particular the proportion of cases progressing to peptic ulcer. The study was carried out in one urban general practice. One hundred and three patients who had presented with dyspepsia over the 1973–80 period and who were found to have a macroscopically normal endoscopy were reassessed between seven and 14 years later. Gastric antral biopsies had been taken routinely at endoscopy and were subsequently re-examined for the presence of* H pylori. *The patients' medical records were examined to establish their consulting rates over the follow-up period and whether they suffered from any other medical conditions. Patients were interviewed to assess the course of their dyspeptic symptoms. Comparison of patients who were unequivocally* H pylori *positive with those who were negative revealed no significant differences in the consultation rate for gastroenterological symptoms, in the proportion of patients referred to a hospital consultant or for further gastroenterological investigations or in the proportion reporting that their symptoms had improved. However, a statistically highly significant relationship was found between* H pylori *infection and hypertension.*

The results of this study have shown that there is a good prognosis for non-ulcer dyspepsia whether or not H pylori *infection is present. The association between* H pylori *gastritis and hypertension clearly merits further investigation.*

Introduction

SUPERFICIAL chronic active (type B) gastritis is usually associated with *Helicobacter pylori* infection.[1] Since the gastritis improves where the organism is eradicated a causal role for *H pylori* seems likely.[2] A role for *H pylori* has also been suggested in the causation of duodenal ulcer, a condition almost invariably associated with chronic active gastritis, although the associations of the organism with gastric ulcer and oesophagitis are less clear.[3]

The long-term prognosis for patients suffering gastritis associated with *H pylori* infection and in particular the number progressing to peptic ulcer, is unknown. In this study the course of dyspeptic symptoms has been followed in general practice patients who were found to have had gastritis associated with *H pylori* infection between seven and 14 years previously.

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Method

The original study was carried out in one urban general practice in Gloucester with a list of 8000 patients.[4] Over the period 1973 to 1980 539 patients presented with dyspepsia. Dyspepsia was defined as persistence of any of the following symptoms for more than two weeks: upper abdominal pain or discomfort related to food; retrosternal or upper abdominal pain related to posture; pain relieved by alkalis or vomiting; pain experienced at night. Each patient underwent upper alimentary endoscopy and also an oral cholecystogram. Of the 314 patients examined who were still on the practice list in 1989, 125 had been found to have no macroscopic abnormality at original endoscopy or on cholecystography. Of this latter group 103 were available for follow up and results for these patients are presented here.

At the original endoscopic examination routine gastric antral biopsies had been taken from each patient and these were re-examined for the presence of *H pylori* and for superficial chronic active gastritis.[5] The patients were then divided into three groups:

Group A — *H pylori* positive, chronic active gastritis positive.
Group B — *H pylori* negative, chronic active gastritis positive.
Group C — *H pylori* negative, chronic active gastritis negative.

An analysis of each patient's general practice records was carried out to establish their annual consulting rates for all conditions and for gastrointestinal disorders. The occurrence of other medical conditions was recorded. The medical records were also searched for the subsequent development of an organic cause for dyspepsia. Each patient was interviewed to assess the course of their dyspeptic symptoms and a blood sample taken for estimation of *H pylori* urease antibody, a marker of infection.[6]

The results for groups A and C were compared statistically using the chi-squared test or Student's t test as appropriate. It was difficult to be certain of the status of patients in group B. As they had histological gastritis it is highly likely that most of them did have *H pylori* infection but histological analysis of biopsies alone may miss the presence of *H pylori* and direct microbiological assessment of the biopsies was not possible.

Results

The number of patients and the proportion of men in each group are given in Table 1. The mean age of patients in group A was significantly higher than for patients in group C. The mean length of follow up for these patients was 11.4 years (range 7–14 years).

Comparison of patients who were unequivocally *H pylori* positive (group A) with those who were unequivocally *H pylori* negative (group C) revealed no statistically significant difference in the consultation rate for gastroenterological symptoms, or in the proportion of patients referred to a hospital consultant or for further gastroenterological investigations over the follow-up period (Table 1). However, the annual consulting rate for all conditions was significantly higher for patients in group C.

Over a half of the patients in each group reported that their symptoms had improved and one quarter had no further consultations for dyspepsia (Table 1). Only two patients from group

Table 1. Age, consultation rates, proportion of patients referred and improvement of symptoms for the three groups.[a]

	Group A	Group B	Group C	Statistical significance[b]
Number of patients	33	22	48	–
% of men	*48*	*59*	*50*	–
Mean age (SE) (years)	61 (2)	57 (2)	54 (1)	$P<0.01$
Mean annual number of consultations for all conditions (SE)	2.8 (0.2)	2.9 (0.2)	3.7 (0.4)	$P<0.01$
Mean annual number of consultations for gastro-enterological symptoms (SE)	0.6 (0.1)	0.6 (0.1)	0.6 (0.1)	NS
% of patients subsequently referred for consultant opinion	*6*	*14*	*4*	NS
% of patients referred for further endoscopy or barium meal	*39*	*32*	*21*	NS
% of patients reporting their symptoms to be:[c]				
Better	*68*	*52*	*58*	NS
Unchanged	*21*	*38*	*30*	NS
Worse	*11*	*10*	*12*	NS
% of patients making no further presentation for dyspeptic symptoms	*24*	*18*	*25*	NS

[a] Group A: *H pylori* positive, chronic active gastritis positive; group B: *H pylori* negative, chronic active gastritis positive; group C: *H pylori* negative, chronic active gastritis negative. [b] Group A versus group C. [c] Based on numbers of patients interviewed: group A $n = 28$, group B $n = 21$, group C $n = 43$. SE = standard error of the mean.

A were subsequently found to have an organic cause for their dyspepsia — one had a peptic ulcer and one gallstones. No organic cause was reported for any of the patients in group C.

The *H pylori* urease test was positive in 23 (82%) of the 28 patients tested from group A, suggesting that five patients had cleared the organism. All of this group had received at least one course of antibiotics. Only two of the five patients who were no longer positive had noticed an improvement in their symptoms. Significantly fewer of the patients tested in group C were positive (6/43, 14%; $P<0.01$). These patients had probably acquired the organism during the follow up period. Four of these six patients reported an improvement in their symptoms while two said they were worse.

Analysis of the patients' medical records revealed an unexpected significant association between the presence of *H pylori* and hypertension, defined as diastolic blood pressure consistently in excess of 95 mmHg. No less than 14 patients in group A (42%) were hypertensive compared with only six in group C (12%); this had been detected before the original endoscopy in nine patients in group A (27%) compared with only three in group C (6%) (Table 2). Three patients in group A subsequently had a myocardial infarction and one a stroke. One patient from group C had angina, one a myocardial infarction and one a stroke (Table 2).

Discussion

This study confirms that there is a good prognosis for non-ulcer dyspepsia, with a number of patients seeking no further medical advice for their symptoms and very few progressing to a specific organic problem. *H pylori* has only been discovered relatively recently and therefore published studies have not specifically analysed the long-term prognosis of patients who have non-ulcer dyspepsia associated with *H pylori* infection. In view of the organism's proven relationship with both histological chronic active gastritis[1] and duodenal ulcer[2] it might be anticipated that its presence would be an adverse factor. However, no evidence was found to support this. The prognosis would appear to be uniformly good whether or not *H pylori* infection is present.

The apparent acquisition of *H pylori* by some patients over the follow-up period is to be expected in view of the known increased prevalence of infection with age.[7] In addition, several patients who were unequivocally *H pylori* positive at their initial endoscopy appeared to have become negative — these patients had all received antibiotics at some time between the two tests. The lack of correlation between a change in patients' dyspeptic symptoms and an apparently altered *H pylori* status does not support a major role for the organism in the pathogenesis of the dyspeptic symptoms in non-ulcer dyspepsia.

The statistically significant association between both *H pylori* infection and chronic active gastritis and hypertension was unexpected. It should be pointed out that patients in group A were significantly older than those in group C and, since age is one determinant of hypertension, this may be relevant. In a retrospective analysis of this nature it is not possible to say whether hypertension precedes or follows infection or whether antihypertensive agents may have influenced colonization of the stomach with *H pylori*.

Several authors have sought an association between dyspeptic disorders and hypertension, as well as with other cardiovascular diseases. Interestingly, no association has been found with duodenal ulcer, a condition in which 90% of patients have *H pylori* gastritis.[8] However, Sonnenberg,[9] in an analysis of data from social security sources in West Germany confirmed an association between gastric ulcer, a condition also associated with *H pylori* infection, and both ischaemic heart and cerebrovascular diseases.

Another factor known to be important in the pathogenesis of hypertension is excessive alcohol consumption.[10] However, it is unlikely that this could be a common pathogenic factor in the patients studied here since only two patients, both *H pylori*

Table 2. Prevalence of cardiovascular disease among the three groups.

Condition	% prevalence of condition: Group A ($n=33$)	Group B ($n=22$)	Group C ($n=48$)	Statistical significance[a]
Hypertension	*42*	*18*	*13*	$P<0.01$
Prior to first endoscopy	*27*	*14*	*6*	$P<0.01$
Observed subsequently	*15*	*5*	*6*	NS
Angina	*0*	*5*	*2*	NS
Myocardial infarction	*9*	*0*	*2*	NS
Stroke	*3*	*0*	*2*	NS

[a] Group A versus group C. n = total number of patients in group.

negative, are known to have a high alcohol consumption. Furthermore, our own studies have failed to show a relationship between the occurrence of *H pylori* gastritis and alcohol consumption.[11]

Although this is a retrospective study with small numbers of patients, the association between *H pylori* gastritis and cardiovascular diseases clearly merits further investigation.

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