

# Upper gastrointestinal endoscopy in Samoa and a changed protocol for peptic ulcer

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## Abstract

Upper gastrointestinal endoscopy commenced in Samoa in April 1997. During the subsequent nine months, 222 endoscopies were performed. For the 207 patients undergoing endoscopy for the first time, the findings were: normal in 29.5%, duodenal ulcer in 27.5%, gastric ulcer in 13.0%, reflux oesophagitis in 9.6%, gastritis in 9.1% and gastric cancer (carcinoma and lymphoma) in 7.7%. Additional, less common, findings were: oesophageal varices, carcinoma duodenum, post-gastrectomy stomach, Mallory-Weiss tear and carcinoma larynx. 96.4% of patients with duodenal ulcer were infected with *Helicobacter pylori*. Treatment of ulcers was changed from the regimen of long-term ranitidine and antacids, to a one-week triple therapy regimen for *H. pylori*, a significant cost saving. Based on these findings, an empiric regimen of triple therapy for suspected uncomplicated peptic ulcer disease has been recommended. Other countries with similar economic and geographic situations could benefit from this approach.

## Introduction

Upper gastrointestinal disease is a significant cause of morbidity and mortality in the developing world.<sup>1</sup> Peptic ulcer disease is common, due to high prevalence of *Helicobacter pylori* (*H. pylori*) infection in countries with overcrowding, poor sanitation, poor water supply and poor

socio-economic conditions.<sup>2</sup> Gastric carcinoma and gastric lymphoma, conditions also linked to *H. pylori* infection,<sup>3</sup> have similarly high prevalence in developing nations.<sup>4</sup> Diagnosis and treatment of these conditions in poor countries lags behind the industrialised world because of the expense of technology, such as fiberoptic endoscopy, and costs of tests and newer medications for *H. pylori*. Clinical research into the treatment and epidemiology of *H. pylori* in these countries has often been sponsored by the industrialised world, but has not usually translated into prevention or treatment strategies.<sup>5,6,7</sup>

Peptic ulcer and gastric cancer are common in Samoa (see Table 1). A fiberoptic endoscope and light source were donated to the National Hospital in 1994, but an endoscopy service had not been set up prior to April 1997 because of lack of trained local staff. Barium meal had been used for diagnosis. Treatment of ulcers was generally a long term combination of histamine<sup>2</sup> receptor antagonist and antacids even as late as mid-1997. No tests for *H. pylori* were available.

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## Method

In April 1997 an endoscopy service was commenced. Two doctors were trained in the techniques of

endoscopy by a gastroenterologist. Nursing staff were trained in reprocessing using published Australian guidelines for disinfection and sterilisation of equipment<sup>8</sup>. Regular endoscope cultures were taken for quality control. We document here the endoscopy findings in the first nine months of this service (24/4/97 to 29/1/98), and discuss the implications for management of upper gastrointestinal disease in Samoa.

## Results

Two hundred and twenty two upper gastrointestinal endoscopies have been performed, predominantly by two endoscopists, 199 at the Tupua Tamasese Meaole Hospital, Apia, and 23 at the Malietoa Tanumafili II Hospital, Tuasivi, Savaii Island. The procedures were performed under light sedation anesthesia, using pethidine and diazepam. The patients were 125 males and 82 females, age range 15 to 83 years (mean 49 years). Fifteen patients had two endoscopies performed during this period. The indications for the

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**Table 1. Indication of prevalence of upper gastrointestinal disease in Samoa**

	Admissions to National Hospital, Samoa	
	1995	1996
Carcinoma stomach	14	11
Gastric ulcer	10	2
Duodenal ulcer	28	10
Peptic ulcer	67	99
Gastritis/duodenitis	86	115
Operations per year for complicated peptic ulcer	<i>n/a</i>	28
Operations per year for gastric cancer	<i>n/a</i>	4

*Figures taken from ICD-9 coded discharge diagnoses. Total number of admissions per year, approx 11,500*

procedures were: pain 120; bleeding 46; follow up of gastric ulcer 15; reflux symptoms 10; vomiting 10; anaemia 8; other 13.

Among the 222 endoscopies performed, the findings at endoscopy were as follows : normal 76; duodenal ulcer 57; gastric ulcer 27; oesophagitis 20; gastritis 19; gastric cancer 16; post-gastrectomy appearance 4; oesophageal varices 4; carcinoma larynx 2; Mallory-Weiss tear 2; incomplete due to food residue 2; duodenal cancer 1.

### Histology

Biopsies for histology were taken from all patients with gastric ulcer, and findings suspicious of gastric or duodenal cancer. Because most biopsies are sent to New Zealand in batches, results have been received on only some of these. For the 27 patients with endoscopically benign gastric ulcer, 8 biopsies have been reported, and all are benign. For the 16 patients with endoscopic gastric cancer, 6 biopsy reports have been received, 4 show gastric lymphoma and 2 show gastric carcinoma. Thus 10 gastric cancers still have unknown histology.

### *Helicobacter pylori*

Seventy six biopsies were taken from patients with ulcers and cancer for *Helicobacter urease* tests (HUT tests). Not all patients with peptic ulcer underwent a HUT test, because this test did not become available to us until mid-1997. Some patients with peptic ulcer were already receiving one or more components of the triple therapy regimen at the time of their endoscopy, and their HUT test results are not included. Results for remainder are shown in Table 2.

### Other procedures

Four patients underwent injection therapy with 1:10,000 adrenaline for bleeding ulcers with visible vessels. These procedures were only performed in a small number of patients with very severe bleeding, because of the cost of the endoscopic injectors (single use items).

### Correlation with symptoms

Of 120 endoscopies performed for chronic abdominal pain, 92 (76.6%) were abnormal. On reviewing the symp-

**Table 2. Helicobacter urease test results**

Endoscopic finding	Positive	Negative	Total
Duodenal ulcer (no previous treatment)	27 (96.4%)	1	28
Gastric ulcer (no previous treatment)	8 (57%)	6	14
Cancer (all types)	6 (50%)	6	12
<b>Total</b>	<b>41</b>	<b>13</b>	<b>54</b>

**Table 3. Cost of regimens to treat peptic ulcer in Samoa (in Samoan Tala)**

Medication	per dose	per course	per year	per decade
ranitidine	T 1.00	T 84.00 (6 weeks)	T 168.00 *	T 1680.00*
antacid	T 0.35	T 30.00 (6 weeks)	T 60.00 *	T 600.00 *
<b>ranitidine/antacid combination</b>		<b>T 114.00 (6 weeks)</b>	<b>T 228.00*</b>	<b>T2280.00 *</b>
colloidal bismuth	T 1.00	T 28.00 (1 week)	T 28.00#	T 28.00#
amoxycillin	T 0.10	T 5.60 (1 week)	T 5.60#	T 5.60#
metronidazole	T 0.05	T 1.50 (1 week)	T 1.50#	T 1.50#
<b>"triple therapy"</b>		<b>T 35.10 (1 week)</b>	<b>T 35.10#</b>	<b>T 35.10#</b>

\* Assumption made that duodenal ulcer will relapse twice per year, ongoing. Many patients will have more frequent relapses than this, and may require maintenance treatment. The cost of multiple barium meals, visits to the doctor, surgery and loss of income would add considerably to the cost, but have not been included.

# Assumption also made that triple therapy will result in a cure in the majority of people.

toms of patients with endoscopic cancer, we noted that all had additional symptoms as well as pain, or physical signs suggestive of cancer, including weight loss (5), vomiting (4), abdominal mass (3), anaemia (2) and melaena (1).

### Correlation with barium meal findings

Many patients with chronic abdominal pain had undergone previous barium meal examinations, but these had often been performed many years previously. Sometimes these films or results were unobtainable so a formal correlation was not performed. However there were a few instances where a recent barium meal had underestimated the pathology (e.g. report of a small gastric ulcer but patient had lymphoma involving whole stomach).

### Quality control

Fourteen cultures were obtained from washings of the endoscope (approximately every two weeks). Three of these were positive (all in the first three months), and the endoscope was decommissioned and sterilised further until subsequent cultures were negative.

### Management

Patients with *H. pylori* positive peptic ulceration were given a one week course of oral "triple therapy" with colloidal bismuth subcitrate (*Deno!*<sup>TM</sup>) 2 tabs bid, amoxycillin 500 mg qid and metronidazole 400 mg tds. There were no complications. This treatment was found to give resolution of symptoms in over 90% of patients. Patients with duodenal ulcer were not routinely re-endoscoped, but were followed for symptomatic response. Patients with gastric cancer underwent endoscopy at 4 weeks to check healing of their ulcer.

The costs of various regimens for peptic ulcer, including the one used, are shown in Table 3. The gastric cancers were all late presentations with extensive involvement of antrum, and often body, of stomach. All underwent palliative resection. *H. pylori* was treated if present.

### Discussion

This report demonstrates that upper gastrointestinal endoscopy can be performed safely, under standards accepted by the industrialised world, in developing nations. Given that endoscopy is rarely a life-saving procedure, and often does not change the clinical diagnosis or management, it is vital that the procedure of endoscopy does not cause harm. Reports from the developed world have demonstrated transmission of *H. pylori* and hepatitis C by endoscopy and biopsy, within established modern endoscopy units.<sup>7</sup> Consequently, it is crucial that strict attention be paid to training and ongoing supervision of endoscopy staff and quality control procedures. Local conditions can make sterilisation of endoscopes difficult.

During the nine month period 0.14 % of the Samoan population underwent endoscopy. Of these 25 % had a duodenal ulcer. Of all endoscopies performed for chronic abdominal pain over 70 % had pathology, usually peptic ulcer. This suggests it would be reasonable to treat people with an appropriate history with a one week course of triple therapy, without endoscopy. All patients with gastric cancer had "warning" symptoms or signs. Thus we have recommended to the Samoa Department of Health that patients with chronic epigastric pain and no warning features be treated empirically with one week of triple therapy. This strategy will be particularly helpful for patients who live remote from endoscopy services. Endoscopy is reserved for those with danger signs, bleeding, those who fail to respond

to treatment, or those patients who specifically request an endoscopy before treatment. This strategy will be a cost saving to the Health Department.

The triple therapy regimen we have chosen is effective in over 90% of our patients, and is cheaper than the alternatives which are commonly used in the developed world. It is also cheaper than long term histamine 2 receptor antagonist and antacids, the common treatment for ulcer disease in Samoa prior to introduction of endoscopy (see Table 3). We plan to follow up a cohort of ulcer patients prospectively to assess the eradication rate of *H. pylori*

using our regimen. It would be pleasing to think that Samoans may one day have access to the best treatments for *H. pylori* (i.e. regimens which include a proton pump inhibitor). Recent discussions on provision of drugs to developing nations for prevention of vertical transmission of HIV infection are relevant to the issue of whether or not people in the third world, who often contribute to clinical trials designed by the industrialised world, should have access to important but costly drugs.

We have found gastric cancer, particularly lymphoma, to be very prevalent in Samoa (7.7% of all our endoscopies). This is almost certainly due to endemicity of *H. pylori*. Eradication of *H. pylori* in ulcer patients requires not only an effective drug regimen, but also good compliance on the part of the patient, and education by health care professionals. Ideally, these efforts would be combined with improvements in public health education, better sanitation and water supply.<sup>2</sup>

In summary we have shown that endoscopy can be performed safely in the developing world. However in countries which cannot support or afford a safe endoscopy service, or where patients are remote from endoscopy services, it is reasonable, to prescribe empiric treatment for *H. pylori* in patients with chronic epigastric pain. This strategy will result in greater long term cure rate, reduction in morbidity and mortality from peptic ulcer and gastric cancer. Such strategies will be enhanced by improvements in sanitation which will reduce transmission of *H. pylori*.

The rational use of endoscopy and a new treatment protocol for *H. pylori* in Samoa can be used as a model for other countries with similar economic circumstances.

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## References

1. Rouvroy D, Bogaerts J, Nsengiumwa O, et al. Campylobacter gastritis and peptic ulcer disease in Central Africa. *Br Med J*, 1987; 295: 1174.
2. Feldman. Prevention of Helicobacter pylori infection. *Bailliere's Clinics in Gastroenterology*, 1995; 9(3): 447-65.
3. Zaki M, Schubert ML. Helicobacter and gastric lymphoma. *Gastroenterology*, 1995; 108: 610-2.
4. Doglioni C, Wotherspoon AC, Moschini A, et al. High incidence of primary gastric lymphoma in northeastern Italy. *Lancet*, 1992; 339: 834-5.
5. NIH Consensus Development panel. Helicobacter pylori in peptic ulcer disease. *JAMA*, 1994; 272: 65-9.
6. Gupta VK, Dhar A, Srinivarsan S, et al. Eradication of Helicobacter pylori in a developing country; comparison of lansoprazole versus omeprazole in a dual-therapy study. *Am J Gastroenterol*, 1997; 92(7): 1140-2.
7. Hart CA, Murray AE, Walker SJ. Helicobacter pylori and gastritis. *Postgrad Doct*, 1990; 6: 60-66.
8. Australian Gastroenterology Institute. *Gastrointestinal endoscopy: Good Practice Guidelines for the Delivery of Endoscopic Services*. Australian Gastroenterology Institute, 145 Macquarie St, Sydney. NSW 2000 Australia. □