treatment. The period of rest has varied between two weeks and three months. Recovery is helped by the regular use of anti-inflammatory drugs such as phenylbutazone. Local therapy has proved of little value, and hydrocortisone injections have been avoided in view of the extreme difficulty sometimes in excluding the possibility of infection. A study of the group 1 series suggests that spontaneous remission of symptoms is the likely outcome and this applies also to most of the more severe lesions in group 2. Though pubic symphysis was stabilized by arthrodesis in one athlete in group 2 (case 3), it must be indicated only rarely. Lettin¹⁹ however, has reported success with this operation in footballers having this condition with restoration of normal activity.

Discussion

A survey of one professional football club has indicated some correlation between a history of pain in the groin or lower abdomen and the radiological abnormalities around the pubic symphysis; the correlation was 58% in group 1 and 100% in group 2 athletes, all of whom had symptoms and were referred specially for this reason. Clearly excessive physical activity as undertaken by professional footballers is likely to result in abnormalities developing at the pubic symphysis. Infection such as non-specific urethritis is an incidental finding and plays no part in the aetiology.

Hence the evidence strongly favours repeated minor trauma as the most important aetiological factor leading to a lesion which may have a similar radiological appearance to that of osteitis pubis. The term osteitis suggests an inflammatory cause, but if infection were a primary aetiological factor we might have seen some evidence of organized periosteal reaction on the upper margins of the superior pubic rami, but this was not the case.

Instability of the symphysis is an indication that the lesion is more serious. Since the group 2 individuals were referred because of symptoms, the expected incidence of instability would be higher in this group and this was the case; 63% in group 2 compared with 34% in group 1. Instability at the symphysis may lead to a secondary chronic stress lesion in one or both

sacro-iliac joints (cases 1 and 4). A sacro-iliac lesion may occur in association with the other abnormalities of the pubic symphysis and in the absence of instability: of the 37 athletes studied, 20 had a chronic stress lesion in the iliac component of a sacro-iliac joint—and 13 of these also had instability at the symphysis. We conclude therefore that the sacro-iliac lesion may be a primary condition, with a similar aetiology to that of the traumatic lesion of the symphysis pubis, or secondary to an instability at the symphysis. Undoubtedly instability of the sacro-iliac joint resulting from major trauma may lead to a secondary stress reaction at the symphysis pubis (case 3), and this confirms the findings of Coventry and Tapper.¹³

The changes that we observed at the gracilis origin could result from chronic stress at the muscle attachment. Though this view is supported by the fact that the gracilis muscle is an internal rotator of the leg, and is consequently greatly employed in controlling a football, we have no proof for our theory.

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General Practice Observed

Study of Dyspepsia in a General Practice as Assessed by Endoscopy and Radiology

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British Medical Journal, 1974, 4, 214-216

Summary

Fifty consecutive patients presenting in a general practice with dyspepsia were studied. Each patient was referred for a combined barium-meal examination and

cholecystogram, followed by fibroptic endoscopy of the oesophagus, stomach, and duodenum. Thirty patients had a specific lesion of the upper digestive tract and a further four had gall-bladder disease; of these, 16 required surgical treatment. Endoscopy in the remaining 16 patients showed nine with mucosal abnormalities, leaving only seven patients to be classified as normal.

The advantage of having an endoscopy service to supplement radiological investigation of dyspepsia is shown.

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Introduction

There are few previous studies of dyspepsia based on general practice. Weir and Backett¹ studied a population of 1,050 males

in semi-rural north-east Scotland. After a postal questionnaire and random interviews, supplemented by scrutiny of all linked medical records, they found a prevalence rate of 15% for diagnosed or likely peptic ulcers in the male population, but the prevalence rate in men with dyspepsia was 46%. Gregory² re-examined 102 patients with dyspepsia and normal x-ray films who had been referred by their general practitioners six years previously for a barium-meal examination. He found that 85 (83%) were symptomatically improved and in only three did a repeat barium-meal examination show a peptic ulcer. He concluded that dyspepsia without ulcer on x-ray examination has a good prognosis in general practice. Weir and Backett¹ in their larger sample in north-east Scotland, however, found that the number who became symptom free was offset by a similar number who developed dyspepsia for the first time.

Studies of dyspepsia based on symptomatology or radiological investigation are limited by these methods of diagnosis. The current expansion of facilities for fiberoptic endoscopy allows for more accurate diagnosis in diseases of the upper digestive tract.³ The development of such a service in the area provided the stimulus for this study of dyspepsia.

Patients and Methods

The patients with dyspepsia presented in a single practice run by three general practitioners in the city of Gloucester. The practice serves a mainly urban community. During this study it comprised 7,650 people of whom an average of 400 consulted the doctors each week.

Every patient presenting with dyspepsia was considered for the study, the criteria for acceptance being 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, or pain experienced at night.

Patients who had received previous medical or surgical treatment were not excluded. Each patient was prescribed antacids and referred for a combined barium-meal examination and cholecystogram within the next 10 days. This was followed by endoscopic examination of the oesophagus, stomach, and proximal duodenum as described by Cotton.³

Results

The study covered a six-month period from August 1973 to January 1974. Fifty-one patients presented with dyspepsia fulfilling the criteria, and of these 50 consented to investigation (33 men and 17 women).

On barium-meal examination three patients were found to have gastric ulcers, 18 to have pyloroduodenal disease, and eight to have hiatus hernia. The remaining 21 were found to be normal.

On endoscopic examination 30 patients had specific lesions of their oesophagus, stomach, or duodenum. Three patients had gastric ulcers, none of which had been reported on barium-meal examination. One patient, a man of 48, was found to have a carcinomatous ulcer which had been reported on barium-meal examination as benign and the endoscopic diagnosis was confirmed by cytology and biopsy. Duodenal ulceration was found in 11 patients and pyloroduodenal scarring without active ulceration in a further 12. In four of these patients in which endoscopy showed pyloroduodenal deformity or ulceration barium-meal examination had shown a hiatus hernia without any other lesion. There were also two patients with hiatus hernia and one with benign stricture of the oesophagus with ulceration. Of the remaining 20 patients nine had inflammatory mucosal changes in the absence of a specific lesion, and in three of these atrophic gastritis was found on histological examination. Endoscopic findings were completely normal in only 11 of the 50 patients studied.

A comparison of the findings on barium-meal examination and endoscopy is shown in the table.

On cholecystography abnormalities were found in six patients of whom three had gall stones and three a non-functioning gall bladder. One patient had had a previous cholecystectomy, and in one the examination failed. Function was reported as normal in the remaining 42 patients.

Discussion

We expected the survey would show only a few patients with organic disease, but the results contradicted this assumption. In 50 consecutive patients presenting with dyspepsia 30 had a specific lesion of the oesophagus, stomach, or proximal duodenum and a further four had gall bladder disease. Of these 34 patients with organic disease 16 required surgical treatment. Endoscopic results in the remaining 16 patients showed nine with mucosal abnormalities, leaving only seven patients to be classified as normal.

This is a preliminary report and further study may show fewer patients with organic disease. Experience in another general practice in Gloucester over a month's trial period showed, however, that similar numbers of patients to those in our study were consulting their doctor with dyspepsia (as we defined it).⁴

In north-east Scotland Weir and Backett¹ found a prevalence of 154 per 1,000 for proved ulcer in the male population. They also found a "presumptive ulcer" in 46% of male dyspeptics. Our figures show that 60% of dyspeptics of both sexes have a specific lesion when more accurate methods of investigation are used. If the prevalence figures reported by Weir and Backett are considered in conjunction with our results and accepted as being of general application, then a population of about 300,000 served by a single district general hospital may include 4,500 severe dyspeptics, of whom 60% (2,700) have a specific lesion of the upper gastrointestinal tract.

Thus many patients with dyspepsia are receiving inadequate treatment when an underlying lesion remains undiagnosed. The initial screening of patients with dyspepsia should combine a cholecystogram with the barium-meal examination as the combined investigation often saves the patient, doctor, and radiologist much time in achieving a correct diagnosis. A negative result on barium-meal examination must be regarded with suspicion, and if the patient's dyspeptic symptoms continue referral for fiberoptic endoscopy should follow. Cotton³ has shown that 32% of patients with a negative barium-meal result have a "clinically significant" lesion at endoscopy, mainly duodenal and antral ulcers. Our experience is similar (see table): there was, for example, no correlation between barium-meal examination and endoscopy in the diagnosis of gastric ulceration. In particular, the single case of gastric carcinoma was thought to be a small benign ulcer by the radiologist. The importance of obtaining endoscopic biopsy and cytological material in every case of gastric ulcer cannot be overemphasized.⁵

Comparison of Findings on Barium-meal Examination with those on Endoscopy in 50 Patients with Dyspepsia. Results are Numbers of Patients.

Barium-meal Examination	Endoscopy					
	Normal Findings*	Hiatus Hernia or Oesophageal Stricture	Benign Gastric Ulcer	Gastric Carcinoma	Duodenal Ulcer	Duodenal Scarring
Normal findings ..	16	1	3			1
Hiatus hernia alone ..	2	2			1	3
Benign gastric ulcer ..	1			1		1
Gastric carcinoma ..						
Duodenal ulcer ..	1				7	2
Duodenal cap deformity ..					3	5

*Including mucosal abnormality.

There was good correlation between radiology and endoscopy in diagnosing duodenal deformity, but precise diagnosis of active ulceration requires direct vision at endoscopy.⁶

Should barium-meal examinations be abandoned as initial investigations in dyspepsia and replaced by endoscopy? The lack of trained staff and equipment for endoscopy in most areas at the district general hospital level makes this an unrealistic suggestion. This study emphasizes the importance of the availability of an endoscopy service for the investigation of the upper digestive tract as already recommended by the British Society for Digestive Endoscopy.⁷ General-practitioner clinical assistants can contribute greatly to providing an adequate endoscopy service, but even with more staff the endoscopy department would not be able to carry out the many investigations for dyspepsia currently performed in the x-ray department. Moreover, initial screening by a combined barium-meal examination and cholecystogram with subsequent endoscopy in selected patients will provide the most accurate diagnostic approach to the problem of dyspepsia.

Conclusions

Dyspepsia is a common complaint, the numbers seen in this study being confirmed by previous larger surveys. Many patients with dyspepsia have a specific lesion and in many the symptoms are severe enough to require surgery.

Patients with specific lesions of the oesophagus, stomach,

or duodenum may remain undiagnosed unless an endoscopy service is available. Thus, endoscopy services, based on district general hospitals, need to be further developed. The appointment and training of general-practitioner clinical assistants can contribute to the provision of an adequate service.

Nevertheless, the combination of a cholecystogram with the barium-meal examination will avoid the delays in diagnosis which result if the investigations are ordered separately.

We thank Dr. S. C. Truelove for his helpful advice and encouragement; Drs. T. E. Durkin and K. M. Watson, who referred patients to the survey; and Mrs. H. M. Shephard, who co-ordinated our records throughout, and her secretarial colleagues. Lastly, we thank the staff of the department of endoscopy, Gloucestershire Royal Hospital, for their support.

This survey was supported in part by a grant from the research committee of the South Western Regional Hospital Board.

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Today's Treatment

Blood and Neoplastic Diseases

Rational Approach to the Chemotherapy of Human Malignant Disease—II

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British Medical Journal, 1974, 4, 216-218

The usual way of measuring a response to chemotherapy in man is to assess the reduction in tumour size and improvement in the patient's general condition. Unfortunately, many types of tumour do not respond to chemotherapy using these criteria, but it must not be inferred that the therapy is ineffective in killing many tumour cells. Data on the volume of a tumour are unreliable when used as the sole end-point for estimation of the fraction of tumour cells killed by therapy.

Tumour volume studies can underestimate tumour cell kill by several orders of magnitude. The studies of the hamster plasmacytoma response to cyclophosphamide have shown the difficulties.¹ Bioassays showed that tumour cell kill after a single dose of cyclophosphamide was rapid (a few hours), but a change in the tumour mass was not noticed for several days and the regression nadir was

not reached until after one to two weeks or more. By this time much viable tumour had regrown and the number of viable tumour cells could approach that of untreated controls even though the total mass was less.

A reliable estimate of the number of remaining viable tumour cells would be of immense importance in man, but there are few human tumours in which this can be made. Gestational choriocarcinoma and myeloma are two examples. Assay of chronic gonadotrophic hormone excretion in patients with choriocarcinoma has proved of great value in controlling chemotherapy in this disease. An effective drug regimen becomes quickly apparent, and continuing it can reduce the viable cell population to a level enabling the patient to be cured. In spite of this the tumour masses as observed—for example on chest x-ray film—may take a year or more to resolve finally after adequate chemotherapy. In myeloma serial estimations of myeloma protein production can also give a useful indication of response and allow the continued development of useful chemotherapy.

One of the most important advances which could be made concerning solid tumours in man would be the development of marker systems for assessing accurately the amount of viable tumour. Potentially useful chemotherapy will be overlooked if tumour mass is the only criterion of response.

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