# Factors influencing general practitioners' referral to hospital of adults with presumed infective diarrhoea

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*SUMMARY*

***Background.*** *Acute infective diarrhoea is one of the commonest reasons for admission to hospital with an infectious disease.*

***Aim.*** *This study set out to describe the clinical features of infective diarrhoea at the time of presentation in adults managed in the community or admitted to hospital in 1990–91, in order to try to understand the decision-making process which led to referral to hospital.*

***Method.*** *Data were collected from general practitioners by computer assisted telephone interview for 114 patients with presumed infective diarrhoea referred to the infection unit at the City Hospital, Aberdeen from all practices in the Grampian region and for 121 non-referred patients managed within seven practices.*

***Results.*** *General practitioners appeared to use examination, investigation and referral selectively in patients presenting with diarrhoeal illness. A comparison of referred and non-referred patients identified differences in patients' reasons for consultation and the general practitioners' clinical findings, suggesting these were important in the decision to refer the patient for hospital admission. General practitioners were more likely to refer adult patients with infective diarrhoea if the patients were older, were seen at home and were more acutely unwell with fever, dehydration and abdominal tenderness.*

***Conclusion.*** *The identification of these criteria may help general practitioners to decide when to refer a patient with infective diarrhoea to hospital.*

*Keywords: referral to hospital for admission; medical decision making; diagnosis; diarrhoea.*

## Introduction

ACUTE infective diarrhoea is common and usually self limiting.[1-3] It is responsible for considerable morbidity among adults, leading to restriction of activity and time off work.[2,4,5] Data from a large community study of adults from Tecumseh, United States of America, revealed that the peak incidence of infective diarrhoea was in the 20–29 years age group and more than 45% of adults had reduction of activity.[2] Garthwright and colleagues estimated that there were 99 million cases of acute enteritis occurring in all age groups annually in the USA and that more than half had at least one day of restricted activity.[5] However, only 8.6% of patients with diarrhoea consulted a physician and only 0.25% required hospitalization. In contrast, 10% of adult patients consulting with acute infective diarrhoea required hospitalization in a Swedish study.[3] Thoren and colleagues estimated that the total yearly cost of acute diarrhoea in adults, including loss of productivity and hospital medical care, was substantial.[6]

These studies suggest that although only a small proportion of acute enteric illnesses result in a patient consulting a doctor, they remain an important cause of morbidity and financial loss in otherwise healthy adults. Furthermore, the small proportion of individuals who seek medical help accounts for a high percentage of the workload of the general practitioner[7] and hospital infection units.[8] In the United Kingdom, for example it has been calculated that over 1.3 million adults visit their general practitioner annually for proven or presumed infective diarrhoea.[7] An analysis of admissions to the infection unit at the City Hospital, Aberdeen over 12 months revealed that diarrhoea was the commonest (21%) presenting symptom and accounted for the biggest proportion of the workload.[9] The majority of these referrals were from local general practitioners, with the remainder from medical and surgical units.

Two studies have documented that fever, restriction of activity and severity and duration of diarrhoea are common reasons for adults with acute diarrhoea to seek medical advice.[2,6] In the UK, general practitioners are usually the first source of medical help available to patients. The incidence and clinical presentation of specific types of enteritis in general practice in the UK has already been studied.[10] However, patients' reasons for consultation, general practice management and factors influencing general practitioners' decision to refer an adult patient to hospital are less clearly identified.

The aim of this study was to describe the clinical features at the time of presentation of infective diarrhoea in adults managed in the community or admitted to the Aberdeen infection unit in order to try to understand the decision-making process which led to referral to hospital. There is no generally accepted definition of diarrhoea. Definitions that measure increased stool frequency or stool consistency account neither for the subjective discomfort of the patients, nor the fact that several loose stools per day can be consistent with normal health in some people.[3] The entrance criterion to this study was therefore related to the general practitioners' assessment that the patient was ill because of infective diarrhoea and its associated symptoms.

## Method

This was a descriptive study in which two study populations, referred and non-referred patients with infective diarrhoea, were identified.

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The referred patients consisted of all adults over the age of 15 years admitted to the infection unit at the City Hospital, Aberdeen between November 1990 and September 1991 with the diagnosis of presumed infective diarrhoea, as defined by the referring practitioner. All general practitioners who had referred patients with infective diarrhoea were requested to complete a computer assisted telephone interview[11] with D N concerning clinical presentation (history and examination), pre-referral management and reasons for referral. Data on reasons for referral are not presented here. The interviews were carried out within two weeks of referral and occurred throughout the year. During the interview, the interviewer sat in front of a computer terminal and asked the general practitioner the questions presented on the screen and entered the replies directly. Data were entered and stored using *Epi info* software.[12] Of the 121 patients referred with presumed infective diarrhoea, 114 interviews were completed with the referring general practitioner.

Seven volunter practices were recruited from different areas of Grampian region to reflect a mix of rural and urban practices. The practices served a population of 46 750 patients (approximately 9.4% of the total population of Grampian region). All adults presenting between November 1990 and October 1991 with the diagnosis of presumed infective diarrhoea were identified by the practices. The general practitioners who saw the patients were asked to record patient details including name, date of birth, place and date of consultation and the main symptom that had led to presentation. D N conducted computer assisted telephone interviews with the general practitioner consulted by the patient for a one in five random sample of these cases. The interview was identical to that used for referred patients except that referral details were omitted. Again, the interviews were carried out within two weeks of identification of the patient. The practices identified 608 patients presenting with infective diarrhoea and general practitioners were interviewed about 121 of these cases. None of these interviews was about a patient subsequently referred to hospital. Twelve of the 608 patients identified by the practices were admitted to the Aberdeen infection unit and were thereby included in the referred patient group.

The data were analysed using 2 x 2 and 2 x *n* chi square, chi square for trend and Mann Whitney *U* tests. In the results presented, chi square tests were used unless otherwise stated.

**Table 1.** Characteristics of clinical presentation in referred and non-referred patients.

| | % of patients | |
|---|---|---|
| | Referred (*n* = 114) | Non-referred (*n* = 121) |
| *First consultation* | | |
| Home visit | *78.9* | *26.4* |
| Surgery consultation | *18.4* | *67.8* |
| Telephone consultation | *2.6* | *5.8* |
| | $\chi^2$ = 65.2, 2 df, *P*<0.001 | |
| *Duration of symptoms (days)* | | |
| <1 | *36.0* | *19.8* |
| 1–3 | *43.0* | *52.1* |
| 4–7 | *10.5* | *16.5* |
| 8+ | *10.5* | *11.6* |
| | $\chi^2$ = 8.2, 3 df, *P*<0.05 | |
| *Frequency of diarrhoea (per day)* | | |
| 1–5 | *31.6* | *55.4* |
| 6–10 | *49.1* | *35.5* |
| 11+ | *19.3* | *9.1* |
| | $\chi^2$ = 13.8, *P*<0.001[a] | |
| *Associated symptoms* | | |
| Abdominal pain | *41.2* | *30.6* |
| Fever | *35.1* | *9.9* |
| | $\chi^2$ = 21.5, 1 df, *P*<0.001 | |
| Bloody diarrhoea | *17.5* | *8.3* |
| | $\chi^2$ = 4.5, 1 df, *P*<0.05 | |
| *Most important reason for presentation* | | |
| Severity of symptoms | *65.8* | *35.5* |
| Duration of symptoms | *14.0* | *37.2* |
| Social[b] | *8.8* | *8.3* |
| Blood in stool | *6.1* | *4.1* |
| Anxiety | *5.3* | *14.9* |
| | $\chi^2$ = 30.0, 4 df, *P*<0.001 | |

*n* = number of patients in group. df = degrees of freedom. [a]Chi square test for trend. [b]For example, poor home circumstances or living alone.

## Results

### *Patient characteristics*

Of the 235 patients 141 (60.0%) were women, with no difference between the referred and non-referred groups. The peak incidence of infective diarrhoea was in the age group 21–30 years (34.0% of the patients were in this age group). The mean age of the referred patients was significantly higher than that of the non-referred patients (51.0 versus 40.7 years; *P*<0.001, Mann Whitney *U* test). There were no differences in the total number of presentations between November and April and May and October for either group, but a seasonal peak was observed during the months of July and August for both groups combined.

### *Clinical presentation*

Diarrhoea with or without vomiting was the commonest symptom at first consultation in both groups of patients (69.8% of all 235 patients). Abdominal pain was the commonest associated symptom (Table 1), being experienced by 35.7% of all 235 patients. The majority of the patients (75.3%) had diarrhoea for up to three days prior to consultation with their general practitioner (Table 1). More referred patients had diarrhoea of less than 24 hours' duration prior to the first consultation than non-referred patients. Referred patients were more likely to report frequent diarrhoea, bloody diarrhoea and fever. Referred patients were also more likely to have received a home visit for the first consultation.

Nineteen patients (8.1%) gave a history of travel abroad, which was associated with the seasonal peak in July and August (10/19). A history of contact with a person with similar symptoms either at home (usually a young child) or work was given by 16.2% of patients. There was no significant difference in these factors between the two groups of patients.

General practitioners were asked about patients' reasons for consultation. Severity and prolonged duration of symptoms were the reasons identified most commonly (Table 1). Of the 118 patients consulting because of the severity of their symptoms 63.6% were referred whereas of the 61 patients consulting because of the duration of symptoms only 26.2% were referred and 25.0% of the 24 patients consulting because they were anxious.

Seventy per cent of patients (164) had taken no treatment measures prior to seeing their doctor but 18.3% had withdrawn solids from their diet. Few patients had purchased over-the-counter sachets of oral rehydration therapy (2.6%) or anti-diarrhoeal medication (7.2%).

*Patient examination*

Referred patients were more likely to have been given a general examination than non-referred patients (100% versus 88.4%; $\chi^2$ = 12.0, 1 degree of freedom, $P<0.01$) and to have had an abdominal examination (71.1% versus 45.5%; $\chi^2$ = 15.7, 1 df, $P<0.001$). Rectal examination was performed in 17.9% of patients, with no significant difference between referred and non-referred patients (19.3% and 16.5%, respectively).

The findings of the examinations are shown in Table 2. Referred patients were also more likely to have a recorded fever and clinical evidence of dehydration than non-referred patients. Referred patients were more likely to have had clinically significant findings on abdominal examination, including tenderness. Referred patients were also more likely to have had an abnormality on rectal examination but this difference was not statistically significant. Blood per rectum was the commonest finding (24 of 34 clinically significant findings).

*Investigations*

A single stool specimen for culture and a full blood count were the commonest investigations performed (26.4% and 10.6% of patients, respectively). Fewer stool specimens were sent from patients referred to hospital than from those not referred (15.8% versus 36.4%; $\chi^2$ = 12.7, 1 df, $P<0.001$). Thirty two per cent of the 62 stool specimens were positive — 10 with campylobacteria, five with non-typhoid salmonellae, three cases of *Escherichia coli* 0157, one *Aeromonas hydrophila* and one sample with a mixed growth of *Giardia lamblia* and non-typhoid salmonellae. Twenty five patients had haematology and biochemistry tests performed; all of these results were normal.

*Diagnosis and management*

The general practitioners believed that 80.9% of the 235 patients had infective diarrhoea. There was no significant difference between the two groups of patients. For a small proportion of patients (11.9%) the general practitioners were unclear as to the cause of the diarrhoea.

Of the 235 patients 78.3% received general advice regarding diet and oral fluids. Fewer referred patients were given general advice than non-referred patients (59.6% versus 95.9%; $\chi^2$ = 45.1, 1 df, $P<0.001$). Oral rehydration therapy, antidiarrhoeal drugs and antibiotics were prescribed or recommended for 31.9%, 33.2% and 11.5% of all patients, respectively (there were no significant differences between the two groups of patients).

**Table 2.** Examination findings in referred and non-referred patients.

| Finding | % of patients | |
|---|---|---|
| | Referred | Non-referred |
| *General examination (n = 114/107)* | | |
| Clinical dehydration | *63.2* | *6.5* *** |
| Fever[a] | *36.8* | *6.5* *** |
| *Abdominal examination (n = 81/55)* | | |
| Clinically significant findings | *58.0* | *40.0* * |
| Abdominal tenderness | *58.0* | *20.0* *** |
| Abdominal guarding | *7.4* | *1.8* |
| *Rectal examination (n = 22/20)* | | |
| Clinically significant findings | *90.9* | *70.0* |

*n* = number of referred/non-referred patients examined. [a]>37.3 °C. *$P<0.05$, ***$P<0.001$ (all 1 degree of freedom).

Loperamide was the most commonly prescribed antidiarrhoeal drug (52/78). For 17 patients antibiotics were prescribed empirically (all had acute severe symptoms) and for 10 after a pathogen had been isolated in the stool; ciprofloxacin (20 patients), erythromycin (six) and vancomycin (one) were the antibiotics used. Empirical therapy consisted of the use of oral ciprofloxacin alone.

Specialist advice on management was not sought for any of the 235 patients. The majority of the 121 patients who were not referred to hospital did not have a second consultation (92.6%). In 96.7% of cases general practitioners did not see patients for routine follow up and left it to the patient to seek another consultation if the symptoms did not improve.

## Discussion

The purpose of this study was not to assess the incidence of enteric illness but to examine general practitioners' decision making and consequent use of resources (including referral) in managing patients with presumed infective diarrhoea. Therefore, a standard definition of diarrhoea is not central to the findings. This pragmatic study has provided useful information about referred and non-referred patients, and general practitioners' decision making. An alternative design involving a prospective longitudinal study following up patients presenting with diarrhoea in the community would have required an unrealistically large and logistically difficult study.

The finding of a predominance of women patients and peak age of 21–30 years, is similar to the results of other studies.[2,6] There were no differences in presentation between the two halves of the study year, although a seasonal peak was observed in July and August presumably owing to infections acquired during travel abroad and the recognized summer peaks of campylobacter and salmonella infections.[13] The slight difference (by one month) in the period of data collection for the referred and non-referred patients is unlikely to have altered any seasonal pattern of presentation appreciably.

Despite attempts by general practitioners and health visitors to educate patients concerning the importance of fluids and other dietary measures during an episode of diarrhoea,[14] 70% of the patients in the study reported here had taken no simple measures to alleviate their symptoms.

In most cases the general practitioners believed the aetiology of the diarrhoea to be infective. This conclusion was usually based on the acute nature of presentation of the illness and exclusion of other common causes of diarrhoea such as prescribed medication (for example, laxatives, non-steroidal anti-inflammatory drugs, recent courses of antibiotics).

Stool culture was the commonest investigation, being performed in 26% of all patients. Positive microbiological results were obtained from a third of these investigations. The small number of patients who had microbiological investigations is in keeping with pre-existing data,[7] where pathogens were detected in only 2.2% of episodes. Significantly fewer patients admitted to hospital had stool cultures than patients not referred, presumably because general practitioners anticipated that this investigation would be instigated in hospital.

A smaller proportion of those patients referred to hospital received general advice regarding diet and fluids than of those not referred, presumably as general practitioners admitting patients felt that these measures were unlikely to prove to be beneficial. Prescription of commercial oral rehydration packages by general practitioners was common (32% of patients) and a third of patients were prescribed antidiarrhoeal drugs. Despite the potential dangers of prolonged treatment of loperamide[15] it continues to be popular in the management of gastroenteritis in

adults. However, short-term use of these agents in previously healthy adults experiencing a mild episode of infective diarrhoea may be appropriate.[16] Antibiotics, usually ciprofloxacin or erythromycin, were prescribed for 27 patients. Although many have advocated the use of 4-quinolones such as ciprofloxacin in acute enteritis,[17,18] caution should be exercised in the light of emerging evidence suggesting that they may actually prolong the duration of excretion of the enteropath,[19] and promote rapid emergence of quinolone resistance among *Campylobacter* species.[20]

Referred patients were more likely than non-referred patients to have consulted their general practitioner owing to the severity of their symptoms, and to have had diarrhoea for less than 24 hours and more frequent bowel motions. Non-referred patients were more likely to have consulted their general practitioner because of the duration of their symptoms or because of anxiety. Referred patients were older than non-referred patients and were more likely to have been seen at home.

General practitioners appeared selective in their examination of patients, with non-referred patients less likely to receive a general or abdominal examination. It is likely that only the more severely ill non-referred patients were examined. Referred patients were more likely to be acutely unwell with fever, clinical dehydration, and abdominal tenderness. Rectal examination was performed in only 18% of patients. This study did not investigate why general practitioners did not perform a rectal examination, but anecdotal evidence from conversations with doctors following completion of the formal interview suggested that they felt the likelihood of an abnormality to be small and that they expected a rectal examination to be performed at hospital if the patient was referred. In the patients who had a rectal examination, blood per rectum was the commonest abnormality detected.

This study has highlighted some issues relating to the management of patients with infective diarrhoea in general practice. It has described the clinical characteristics of this common illness and has examined reasons why patients seek medical help. General practitioners appear to use examination, investigation and referral selectively in patients presenting with diarrhoeal illness. A comparison of referred and non-referred patients identified differences in patients' reasons for consultation and in the general practitioners' clinical findings, suggesting these were important in the decision to refer the patient for admission. The results suggest that general practitioners seeing adult patients with infective diarrhoea were more likely to refer them to hospital if the patients were older, seen at home and were more acutely unwell with fever, dehydration and abdominal tenderness. The identification of these criteria may help general practitioners to decide when to refer a patient with infective diarrhoea to hospital.

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