Sickness absence after inguinal herniorrhaphy

M. GRIFFITHS, W. E. WATERS, AND E. D. ACHESON

From the Department of Community Medicine, University of Southampton

SUMMARY Eight hundred and ninety-nine men were studied, aged 16-65 inclusive, who underwent an elective inguinal herniorrhaphy during 1970 and 1971 in eight hospitals in Wessex, and under nine consultant surgeons. There was a significant variation in postoperative inpatient stay and total sickness absence between hospitals and between consultants. The physical activity involved in the patient's occupation, his age at operation, previous sickness absence, bilateral herniorrhaphy, attendance at follow-up outpatients' clinic, type of repair, and the influence exerted by three hospitals and two consultants accounted for only 21% of the variation in total sickness absence. The general practitioners who had referred patients to the hospitals for herniorrhaphy, and the consultant surgeons who carried out the operations, were sent a questionnaire to ascertain their attitudes towards follow-up outpatient appointments and the various factors identified in the first part of the study as significantly influencing total sickness absence. A higher proportion of GPs who felt that an outpatient appointment was necessary before return to work was found in relation to the patients who had the longest mean total sickness absences than among the GPs who looked after the patients with shorter total sickness absences.

Inguinal herniorrhaphy is a frequent operation performed annually on approximately 50 000 men of working age in England and Wales. Although the condition is virtually free of mortality it results in significant morbidity. Surgical repair is the treatment of choice and the cost of subsequent inpatient stay and time off work was approximately £2 500 000 a year in England and Wales, in basic social security payment alone, at the time of the study.

The purpose of this retrospective study was to examine variations in postoperative inpatient stay and total sickness absence following the elective repair of an inguinal hernia and to attempt to identify factors which contributed to the variations. Semmence (1973) has shown considerable variation in sickness absence after herniorrhaphy in two teaching hospitals. The present study, which involved eight hospitals of differing types and sizes, and nine consultants, examined the variations between hospitals and between consultants.

The attitudes of the GPs and consultants involved in the study were of obvious importance in determining a patient's attitude towards his illness and in deciding the date of the patient's return to work. Not all patients had a follow-up outpatient appointment after inguinal herniorrhaphy; therefore

the attitudes of GPs and consultants concerning the necessity of such routine outpatient attendances for post-herniorrhaphy patients were examined. This has obvious economic consequences and implications for already busy outpatient departments.

Method

The population of the study consisted of men aged 16-65 inclusive, who were admitted to hospital for an elective repair of an inguinal hernia during 1970 and 1971 (Griffiths *et al.*, 1979). An initial list of herniorrhaphy patients was obtained from the Hospital Activity Analysis data which was checked and supplemented by reference to the operation books at the individual hospitals. The case notes were examined and the following data extracted: age (the groupings correspond with those used by Semmence (1973)), occupation, hospital, consultant, GP, past medical history including recorded evidence of past or present respiratory disease, previous operations, type of hernia (diagnosed at the time of operation), grade of surgeon, type of repair, details of the follow-up outpatient appointment, length of time on the waiting list, use of convalescent facilities,

smoking habits, marital status, and duration of postoperative inpatient stay (day of operation to day of discharge inclusive). The amount of physical activity involved in each occupation was estimated as strenuous, light, or sedentary, independent of knowledge of the duration of sickness absence. Social class was determined from the patient's occupation (Office of Population Censuses and Surveys, 1970). Total sickness absence, defined as the day of operation to the last day of the final social security certificate inclusive, and details of sickness absence in the five years preceding admission and the eighteen months after discharge, were calculated.

Hospitals 1 and 2 are teaching hospitals in the same urban community; hospitals 3 and 4 are district general hospitals; hospitals 5 and 6 are smaller units with resident junior medical staff, and hospitals 7 and 8 are hospitals where the day-to-day management of the patient is conducted by the GP. All patients were admitted under nine consultants, six of whom operated at two or more of the eight hospitals.

All the information collected was related to postoperative inpatient stay and to total sickness absence. As the different factors considered do not exist in isolation but interact among themselves, a multiple regression analysis was performed. From the preliminary statistical analysis 30 variables, which had the greatest effect on the duration of total sickness absence, were entered into the multiple regression analysis.

A questionnaire was sent to the 215 GPs who had referred the herniorrhaphy patients to the eight hospitals. The same questionnaire, with some additional questions, was sent to the nine consultants.

To measure the GPs' attitudes each category was given a score:

Very important	4
Moderately important	3
Relatively unimportant	2
Unimportant	1

A mean score was then calculated for each attitude (mean attitude score) which could range from 4 to 1. The effect of the length of time since qualification and the achievement of higher medical qualifications on attitudes were examined as possible causes for variations between GPs. The sample of GPs studied was then reduced to include only those who had referred four or more herniorrhaphy patients. The attitudes of the 20 GPs whose patients had the longest mean total sickness absence were compared with the attitudes of the 20 whose patients had the shortest mean total sickness absence.

The attitudes of each consultant were compared with those of each of his colleagues. The attitudes of the consultants as a group were then compared with the attitudes of the GPs as a group.

Results

Of the 1309 elective inguinal herniorrhaphy patients, nine (0.7%) were excluded because of a more serious concurrent illness; 206 case notes (15.7%) could not be traced; and a further 195 patients (14.9%) had to be excluded because all of the total sickness absence information was not available. This left a

Fig. 1 Distribution of total sickness absence after elective inguinal herniorrhaphy for men aged 16-65 inclusive

Table 1 Mean total sickness absence (days) by hospital and consultant

Hospital	Mean total sickness absence	No. in sample
1	47.5	218
2	53.9	169
3	52.0	50
4	53.9	111
5	56.1	105
6	49.7	176
7	49.6	37
8	45.2	33
Total	51.2	899
Probability $P < 0.001$		
Consultant	Mean total sickness absence	No. in sample
A	46.4	101
B	50.3	45
C	48.9	143
D	52.9	115
E	51.2	196
F	53.6	102
G	61.0	50
H	45.5	64
I	54.7	83
Total	51.2	899
Probability $P < 0.01$		

total sample of 899 patients (68.7%) for study. There were 89 patients who had a bilateral herniorrhaphy, giving a total of 988 herniorrhaphies. The 195 patients excluded because of lack of total sickness absence information were similar to the study group in respect of age, hospital, consultant, past medical history, previous operations, type of hernia, grade of surgeon, type of repair, and smoking habits. However, a higher proportion were in Social Classes I and III (non-manual) because certain occupations

have special arrangements for claiming sickness benefit. Completed attitude questionnaires were received from 176 of the GPs (81.9%) and seven of the nine consultants (77.8%).

For the 899 patients in the study, total sickness absence varied from eight days to 166 days (Fig. 1) with a mean of 51.2 days (standard deviation 20.5). The differences in mean total sickness absence for hospitals and for consultants (Table I) are highly significant. However, there is no significant

Table 2 Factors found to have a significant effect on total sickness absence

	No. in sample	Mean total sickness absence (days)	Probability
Physical activity involved in the occupation			
Not known	30	48.5	P < 0.001
Strenuous	340	56.8	
Light	337	52.6	
Sedentary	192	39.2	
Total	899	51.2	
Age (years) at operation			
16-20	13	41.2	P < 0.01
21-25	46	45.4	
26-30	53	44.2	
31-35	71	46.5	
36-40	73	51.4	
41-45	98	47.4	
46-50	133	52.4	
51-55	124	54.3	
56-60	179	53.8	
61-65	109	55.2	
Total	899	51.2	
Bilateral herniorrhaphy			
Single herniorrhaphy	810	50.5	P < 0.01
Bilateral herniorrhaphy	89	57.6	
Total	899	51.2	
Attendance at follow-up outpatient clinic†			
No appointment given	169	48.3	P < 0.05
Attendance at clinic	687	52.2	
Total	856	51.4	
Recorded type of hernia repair			
Not known	84	51.6	P < 0.01
Bassini	405	49.0	
Nylon darn	460	54.7	
Others	39	46.4	
Total herniorrhaphies	988	51.8	
Social Class: (Registrar General's classification)			
Not known	30	48.5	P < 0.001
I	34	33.0	
II	117	47.2	
III (non-manual)	82	39.1	
III (manual)	363	54.0	
IV	206	54.7	
V	67	57.5	
Total	899	51.2	
Previous certified sickness absence days during five years before herniorrhaphy			
No absence	251	46.5	P < 0.001
1-28 days	269	49.5	
29+ days	379	55.5	
Total	899	51.2	
Respiratory disease (past or present)			
Not recorded	81	47.8	P < 0.05
Evidence of respiratory disease	287	53.8	
No evidence of respiratory disease	531	50.3	

† Patients who failed to attend a follow-up outpatient appointment (17) and patients with incomplete medical records (26) are excluded.

difference in the mean total sickness absence for consultants operating at more than one hospital or for different consultants operating within the same hospital (except for hospital 4).

The correlation (r) between postoperative inpatient stay and total sickness absence is 0.06 ($P < 0.05$). Table 2 lists the other factors found to have a significant effect ($P < 0.05$) on the mean total sickness absence. Men who experienced more than 28 days certified sickness absence in the 18 months following return to work after herniorrhaphy had a statistically significantly ($P < 0.001$) longer total sickness absence following herniorrhaphy (9.2 days longer than men with no certified sickness absence in the 18 months after return to work). The following factors had no significant effect on mean total sickness absence ($P > 0.05$): type of hernia, recurrent hernia, grade of surgeon performing operation, development of postoperative complications, use of convalescent facilities, marital status, smoking habits, previous operations, previous non-surgical hospitalisation, and length of time on the waiting list. The multiple regression analysis (Table 3) illustrates the cumulative percentage (21.5%) of variation in total sickness absence that the present study had explained.

Table 3 Factors influencing total sickness absence (multiple regression analysis)

Factors influencing total sickness absence	Cumulative percentage of variation in total sickness absence explained
1. Physical activity involved in occupation	9.6
2. Age of patient at operation	12.6
3. Consultant G	14.7
4. Previous sickness absence (five years before herniorrhaphy) unrelated to hernia	16.2
5. Hospital 5	17.7
6. Bilateral herniorrhaphy	18.7
7. Attendance at follow-up outpatient appointment	19.6
8. Type of repair: nylon darn	20.0
9. Hospital 1	20.6
10. Hospital 6	20.8
11. Consultant C	21.0
12. Type of hernia: indirect	21.2
13. Previous sickness absence (five years before herniorrhaphy) resulting from hernia	21.2
14. Consultant I	21.3
15. Type of hernia: direct	21.4
16. Consultant D	21.4
17. Type of repair: Bassini	21.5
18. Social Class	21.5

Variables 10–18 (inclusive) were not significant at $P < 0.05$

Table 4 lists the mean attitude score for the various factors included in the questionnaire sent to the GPs. The achievement of higher medical qualifications significantly reduced the importance attached to past medical history ($P < 0.005$) but did not significantly

Table 4 General practitioners' assessment of the importance of various factors in determining patient's return to work after an elective inguinal herniorrhaphy

Factors	Mean attitude score
1. Physical activity involved in the occupation	3.9
2. Recurrent herniorrhaphy (same side)	3.6
3. Patient's attitude towards returning to work	3.2
4. Bilateral herniorrhaphy	3.1
5. Evidence of productive cough	3.0
6. Postoperative wound infection, subsiding a week after operation	2.9
7. Previous medical history	2.9
8. Direct hernia	2.8
9. Age	2.6
10. Type of repair used	2.4
11. Distance and method of travel to work	2.3
12. Patient's smoking habits	2.2
13. NHS grade of surgeon who performed the operation	2.1
14. Social class	2.1
15. Amount of time that the patient was absent from work as a result of his hernia, before herniorrhaphy	1.9
16. Length of time on waiting list, before herniorrhaphy	1.6

affect any other measured attitudes. However, the group of GPs who had qualified for less than 20 years considered age, patient's attitude towards returning to work, direct hernia, NHS grade of surgeon, and length of time on the waiting list all to be significantly less important in determining sickness absence after herniorrhaphy than the GPs who had qualified for 20 years or more.

The 20 GPs (Group A) whose patients had the longest mean total sickness absence had significantly different attitudes towards outpatient follow-up appointments than the 20 GPs (Group B), whose patients had the shortest mean total sickness absence. Only two from Group B compared with eight from Group A felt that patients should routinely remain off work until after their follow-up appointment (Table 5). Three of the seven consultants completing

Table 5 Comparison of attitudes towards patient's return to work before outpatient appointment of two groups of general practitioners

	Group A (20 GPs whose patients had longest mean total sickness absence)	Group B (20 GPs whose patients had shortest mean total sickness absence)
Patients routinely should remain off work until after outpatient appointment	8	2
Patients routinely need not remain off work until after outpatient appointment	8	14
Does not matter	4	4
Total	20	20

the questionnaire felt that patients should remain absent from work until they had been seen in a follow-up clinic. Fig. 2 clearly illustrates the high correlation of attitudes between GPs and consultants for the other 16 factors.

Fig. 2 Correlation of mean attitude scores of GPs and consultant surgeons for 16 factors (listed in Table 4).

Discussion

The study of sickness absence following inguinal herniorrhaphy has confirmed the considerable variations in time absent from work after herniorrhaphy found by Morris *et al.* (1968) and later by Semmence (1973). The present study showed a significant though unimportant correlation ($P < 0.05$) between mean hospital inpatient stay and mean total sickness absence. Although a significant difference in mean total sickness absence for individual hospitals and consultants was shown (Table 1), it was not possible to demonstrate a 'hospital' influence. In another paper (Griffiths *et al.*, 1979), the mean postoperative inpatient stay following inguinal herniorrhaphy was shown to be more closely related to the individual hospital than to the consultant under whose care the patient was admitted.

Acheson and Feldstein (1964) emphasised the importance of the non-random distribution of types of patients and type of disease between various hospitals and between consultants, and found that in the case of normal maternity care differences for mean inpatient stay between hospitals and

consultants were being minimised. The present study also found a non-random distribution between hospitals of factors significantly affecting mean total sickness absence. For example, hospital 2 had the second longest mean total sickness absence (53.9 days) but it had a low proportion of young patients and also a low proportion of patients with sedentary occupations. If there were a random distribution of patients, hospital 2 would be expected to have a shorter mean total sickness absence.

The recorded method of repair was the only 'medical' factor found to have a significant influence on mean total sickness absence (Table 2). Shuttleworth and Davies (1960) and Magarey (1966) suggested that the method of repair was dependent upon an individual surgeon's choice. The present study found that the type of repair was dictated more by the consultant firm than by the hospital. Discussion about the various types of repair has been primarily concerned with the recurrence rate (Shuttleworth and Davies, 1960; Magarey, 1966; Rostad, 1968; Baumber, 1971). Magarey (1966) suggested that physical strain, particularly at work, was a possible cause of the original hernia. Baumber (1971), however, classified occupations into three groups of physical stress and showed no clear difference in recurrence rate, and claimed that patients, including manual workers, were returning to full duties three to four weeks after inguinal herniorrhaphy with no ill effects. The present study, supported by others (Morris *et al.*, 1968; Semmence, 1973), found that the physical activity involved in the occupation was the most important factor determining the date of a patient's return to work after an elective herniorrhaphy (Table 3). This may merely reflect a widely held belief of the medical professions that manual workers should remain absent from work for a longer period than sedentary workers (Table 4). However, it would be of considerable economic importance to test Baumber's (1971) suggestion that manual workers can return to work three to four weeks after inguinal herniorrhaphy without ill effects.

Semmence (1973) found that 65% of patients attending a follow-up outpatient appointment were still absent from work more than one week after the clinic and concluded that 'the date of the follow-up appointment did not appear to influence the date of return to work'. The present study found that 72.3% of patients who attended a follow-up clinic were still absent from work seven days later. However, patients who were not given an outpatient appointment had a significantly shorter mean total sickness absence than those attending an outpatient clinic (Table 2). If most elective herniorrhaphy patients did not attend a follow-up outpatient

appointment and subsequently returned to work four days earlier, an annual saving of approximately £200 000 in basic social security payments (at the time of the survey) could be achieved in England and Wales. General practitioners whose patients had the shortest mean total sickness absence were significantly more likely to send patients back to work before the outpatient appointment (25.5% of their patients) than GPs whose patients had the longest mean total sickness absence (1.6% of their patients). This finding is consistent with the difference in attitude towards return to work in relation to an outpatient appointment as shown by the attitude questionnaire. It would appear that medical opinion is equally divided about the necessity of a routine outpatient appointment for elective herniorrhaphy patients, since 51.7% of GPs and 42.9% of consultants expected patients to remain off work until after the follow-up clinic.

As found by both Taylor (1971) and Thurlow (1971), previous sickness absence proved a good predictor of sickness absence after inguinal herniorrhaphy (Table 2) and sickness absence after operation was a good predictor of subsequent sickness absence. Semmence (1973) doubted the practicality of linking hospital and social security data. The present study suggests that obtaining social security data for patients claiming sickness benefit through 'normal' channels is useful. The accuracy of the diagnosis of previous sickness absence episodes was not verified but there was no difficulty for the great majority of the sample in establishing the duration of total sickness absence after inguinal herniorrhaphy because the dates for the beginning of the sickness absence corresponded with the inpatient dates available from the case notes.

Semmence (1973) explained 13% and Morris *et al.* (1968) 25% of variation in time absent from work after herniorrhaphy, by multiple regression analysis of medical and demographic factors. The present

study, with 30 variables, explained 22% of the variation in mean total sickness absence. It also obtained information on doctors' attitudes and so confirmed Taylor's view (1971) that 'personal attitudes and those of groups are far more important in determining actual levels of sickness than objective medical or demographic factors'.

We thank the consultants who gave permission for their cases to be studied, the consultants and the GPs for their co-operation, and the Department of Health and Social Security who funded the study.

Reprints from W. E. Waters, Department of Community Medicine, University of Southampton, Southampton SO9 4XY.

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