Factors affecting employment after whiplash injury

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Of 586 employed patients with a whiplash injury 40 (7%) did not return to work. The risk was increased by three times in heavy manual workers, two and a half times in patients with prior psychological symptoms and doubled for each increase of grade of disability. The length of time off work doubled in patients with a psychological history and trebled for each increase in grade of disability. The self-employed were half as likely to take time off work, but recovered significantly more slowly than employees.


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The cost of whiplash injuries in the UK is 0.4% of the Gross National Product1 in terms of legal proceedings and compensation. Most of the latter is awarded for loss of earnings. In 1988, the mean time off work after a whiplash injury was 39 days.2 Little is known, however, about the factors affecting the ability to work after a whiplash injury.

The disability relates to age, gender, previous psychological disease, the direction of the impact, the presence of neurological symptoms or signs and the grade of disability.3-7 Intuitively, the time off work after a whiplash injury should relate to social class, employment status and the degree of manual labour. Patients of higher social class are more likely to be self-employed and engaged in managerial, non-manual work. The self-employed should be better motivated to return to work than employees.

Our aim in this study was to examine whether time off work and the ability to return to full working activity were related to social class, degree of manual activity, the employed status and the grade of disability.

Patients and Methods

We reviewed 717 medicolegal reports which had been prepared for both claimants and defendants. Each report had been written by one of the three senior authors (GB, GL, MG) between 1996 and 1999, and each patient had suffered a whiplash injury in a road-traffic accident. Patients sustaining additional injuries were excluded. The variables recorded were age, gender, psychological history, occupation, employment status, social class, direction of impact, time off work, time to full return to work, neurological symptoms and signs at the time of the report, and the grade of disability according to Gargan and Bannister7 (Table I). The occupation of each patient was graded as clerical, light manual or heavy manual (Table II) and the social class from the Standard Occupation Classification Manual8 (Table III).

<table>
<thead>
<tr>
<th>Grade</th>
<th>Symptoms</th>
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<tbody>
<tr>
<td>A</td>
<td>Free from discomfort. Complete recovery</td>
</tr>
<tr>
<td>B</td>
<td>Mild symptoms which do not interfere with work or leisure</td>
</tr>
<tr>
<td>C</td>
<td>Intrusive symptoms</td>
</tr>
<tr>
<td>D</td>
<td>Severe symptoms. Regular analgesics required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clerical</td>
<td>Manager, secretary</td>
</tr>
<tr>
<td>Light manual</td>
<td>Nurse, police, factory worker</td>
</tr>
<tr>
<td>Heavy manual</td>
<td>Builder's labourer, farmer</td>
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Statistical analysis. Median values and interquartile ranges (IQR) (the range within which 50% of the population lie) were obtained for time off work and return to full activity against each variable. Univariate analyses were carried out using the non-parametric Mann-Whitney U test, for comparing two groups, and the Kruskal-Wallis non-parametric one-way analysis of variance for more than two groups. When two proportions were compared, chi-squared tests were used.

Since the length of time off work was skewed to the right and many patients took no time off, a two-stage strategy was used for the multivariate analysis. Logistic regression identified the factors predicting time off work and, in those who took time off, multiple linear regression of the log of the duration was undertaken.

Results

At the time of injury, 131 of the patients were unemployed and they were excluded. Of the 586 who were in work (262 men, 324 women), 546 (241 men, 305 women) had resumed their occupation and 40 (21 men, 19 women) had not at the time of the report. Neither age, gender nor direction of impact was associated with time off work or its duration. There was a trend to a slower return to full work in women (p = 0.058).

Previous history of psychological illness or anxiety. Of those who did not return to work, 10 (25%) had had a previous psychological illness or anxiety, compared with 59 (11%) of those who did (chi-squared test, p < 0.01). Women with a history of psychological illness took significantly longer off work (median, 21 days) than those without (Mann-Whitney U test, p = 0.03) (median, 8 days), but there was no similar effect in men. Psychological vulnerability almost doubled the time off work (multiplier 1.75, 95% confidence interval (CI) 1.18 to 2.60).

Social class. There was no significant effect of social class on time off work or return to full activity (Kruskal-Wallis test).

Occupation. Of the heavy manual workers, 6 (13.3%) did not return to work compared with 17 (9.2%) of light manual workers and 17 (4.8%) of clerical workers (chi-squared test, p < 0.05). Manual workers took significantly longer time off work than clerical workers (Kruskal-Wallis test, p = 0.006), but there was no significant difference in return to full activity (Table IV).

Employment status. Of the 546 patients who returned to work, 93 were self-employed and they were half as likely to take time off work (odds ratio 0.57, 95% CI 0.34 to 0.95) as employees. Having taken time off work, the employment status had no effect on its duration (median 14 days). Self-employed workers, however, took significantly longer (Mann-Whitney U test, p = 0.001) to return to full activity (median 153 days, IQR 0 to 279) than employees (median 30, IQR 0 to 279). With regard to occupation, self-employed workers took longer to recover than employees.
while 2% of the series of Gargan and Bannister, we have not described the proportion of patients whose disability was associated with a longer time off work (median, 14 days) in women (Mann-Whitney U test, p = 0.011) and a return to full activity (median, 160 days) in both men and women (Mann-Whitney U test, p < 0.001).

Neurological symptoms or signs. Of patients who did not return to work, 24 (60%) had neurological symptoms or signs compared with 150 (27.5%) of those who did (chi-squared test p < 0.001). The presence of such symptoms or signs was associated with a longer time off work (median, 14 days) in women (Mann-Whitney U test, p = 0.011) and a return to full activity (median, 160 days) in both men and women (Mann-Whitney U test, p < 0.001).

Gargan and Bannister grade. All patients who did not return to work were grades C and D. As shown in Table VI, time off work and to return to full activity were associated with increasing severity of disability (p < 0.001). The likelihood of taking time off work doubled (odds ratio 1.94, 95% CI 1.46 to 2.59) and its duration trebled (multiplier 2.93, 95% CI 2.44 to 3.52) for each rise in grade of disability.

Discussion

We have not described the proportion of patients whose working capacity is affected by whiplash injury. Many patients with a whiplash injury do not complain of symptoms immediately after the accident, but develop them later. It is probable that a significant proportion recover uneventfully without recourse to doctors or lawyers. The Quebec task force series of reports after vehicle damage showed that 2% had difficulty in working after one year, while 2% of the series of Gargan and Bannister, in which 50 occupants of cars in 38 road-traffic accidents were prospectively reviewed, had changed jobs after two years. Our finding of 7% of patients who did not return to work is similar to that in the more robust prospective series of whiplash injuries. Although the number of patients unable to work is high, the factors associated with this restriction are probably representative.

Reports prepared for claimants and defendants are usually similar in factual content, but differ in interpretation. Our study used only factual content and was not influenced by interpretation.

Ferrari and Russell attribute the chronic pain suffered by patients after a whiplash injury to psychological factors. Road-traffic accidents are known to cause psychological symptoms which are a component of the response to a whiplash injury. Farbman found that emotional factors were strong predictors of prolonged symptoms and that patients with a previous history of psychological illness or anxiety took significantly longer to recover. This study confirms his observation, suggesting that patients with known psychological illness are susceptible to the psychological consequences of road-traffic accidents which contribute to delayed return to work.

It has been suggested that the symptoms of a whiplash injury are purely psychological and biosocial. If this were the case, physical demands would have no effect on work after injury. Our study indicates, however, that the greater the physical component, the greater the time off work.

The self-employed do not earn if they do not work. Having returned to work their income is dependent on their output. If the time off work after a whiplash injury was purely a function of motivation, the self-employed would be expected both to return to work and full activity sooner than employees. In fact, having returned early they seem to have greater difficulty in regaining full activity, suggesting that other physical or psychological factors are involved.

In our study, whiplash injuries occurred in all social classes. Heavy manual workers occupy the lowest social classes. Despite this, social class exerted no effect on time off work or time to recovery of functional employment. This reinforces the dual physical and psychological components of the disability.

Rear-impact collision is the commonest cause of whiplash injury. Hildingsson and Toolanen observed that this was not a factor of prognostic importance in relation to final recovery, which is confirmed by our study.

Several authors have associated the presence of neurological symptoms or signs after whiplash injury with a poor prognosis. Hildingsson and Toolanen have been the only investigators to demur. In our study, patients with neurological symptoms or signs took significantly longer to recover. This study confirms the effect of the severity of the symptoms on time off work and return to full working activity was more than four months longer.

Farbman observed that the number of working days lost after a whiplash injury increased with increasing severity of the injury. Our study confirms the effect of the severity of the symptoms on time off work and return to full working activity. The Gargan and Bannister grade, which reflects

<table>
<thead>
<tr>
<th>Gargan and Bannister grade</th>
<th>Number of patients</th>
<th>Median time off work (days)</th>
<th>Median return to full activity (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>76</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>202</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>C</td>
<td>256</td>
<td>18</td>
<td>253</td>
</tr>
<tr>
<td>D</td>
<td>12</td>
<td>336</td>
<td>456</td>
</tr>
</tbody>
</table>
the severity of symptoms, was the strongest predictor of the likelihood of taking time off work.

In summary, increasing severity of disability, employed (rather than self-employed) status, heavy manual occupation and a previous history of psychological disease are the factors associated with disruption of work after whiplash injury.

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References