Resumption of driving following acquired brain injury amongst Bruneians

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ABSTRACT

Introduction: Motor vehicle transport is common everywhere and in our local setting, most travel using their own cars. Resumption of driving after acquired brain injury (ABI) has been shown to affect subsequent community integration. Forty to 66% of ABI survivors return to driving according to studies elsewhere. This study assesses the number of patients who resumed driving after ABI in Brunei Darussalam. Materials and Methods: Brunei Darussalam citizens after ABI who were above 18 years old and had received occupational therapy in RIPAS Hospital, Brunei Darussalam between June 1, 2008 and May 31, 2009 were retrospectively identified and studied. Data was collected from the Department of Occupational Therapy records supplemented by telephone calls to patients or their relatives. Results: Of 111 patients included in the study, 43 patients did not drive prior to ABI, since they were either older in age or never had a driving license. Of those with driving licenses (68) prior to ABI, 15 (22%) resumed driving: traumatic brain injury (n=1/5, 20%), brain tumour (n=1/4, 25%), brain infection (n=1/1, 100%) and for stroke (n=12/58, (20.7%). Gender and age groups were not significant predictors of return to driving. Conclusion: Only 22% of Bruneians after ABI resumed driving and this is lower than studies elsewhere. Reasons considered include severity of injury and cultural factors which all require further study.

Keywords: Acute brain injuries, automobile driving, rehabilitation

INTRODUCTION

Brunei Darussalam has a population of 406,200 of which 110,500 (27.2%) are temporary residents. Car ownership is high in Brunei Darussalam and most travel using their own cars. In 2008, 18,847 new private cars were registered and 130,835 vehicle licenses were renewed. Like most countries, the minimum age that a vehicle driving license can be issued after successful completion of driver knowledge test and the road test is 18 years old. In many countries, including Brunei Darussalam, driving is an integral part of independent living. After an illness, being able to drive could be quantified as a measure of recuperation. In addition, resumption of driving has been shown to affect community integration. In previous studies...
elsewhere, among stroke survivors, 66% resumed driving while 44% to 50% of traumatic brain injury survivors returned to driving. 5-7

This study aimed to determine the percentage of patients in Brunei Darussalam who returned to driving after acquired brain injury (ABI), utilising this figure as a proxy measure of disability.

MATERIALS AND METHODS
This was a retrospective cross-sectional study of all patients registered in the Occupational Therapy (OT) Unit, RIPAS Hospital between June 1, 2008 and May 31, 2009 after ABI who were Bruneian citizens aged 18 years and above. Eighteen years of age was taken as a cut-off point as this is the legal driving age in Brunei Darussalam.

Data collected were the primary diagnosis (reason for referral to OT), gender, age and residency status of the patients. Only Brunei Darussalam citizens and permanent residents were included for the study as temporary residents (expatriates) tend to return to their country of origin to recuperate from their illness. Measures of disability status, either pre or post injury, were not collected in this study as different measures are utilised by different health care professionals with no standardised measure uniformly available.

Data collection was done by reviewing OT records and interviewing either the patients or their family members through telephone calls. Of 150 patients with ABI registered in the OT records, 31 were deceased and eight could not be contacted. Of the remaining 111 patients, 68 patients had driving licenses prior to their ABI. 43 patients did not drive before they had ABI, since they were either older in age or never had a driving license.

Data was coded and entered into Wordexcel and later analysed using the Statistical Package for Social Sciences (SPSS, Version 10.0, Chicago Il, USA). Fischer’s exact test was used where appropriate and p value of less than 0.05 was taken as significant.

RESULTS
Of the 68 patients with driving licenses, 15 (22%) returned to driving. After ABI, one out of five traumatic brain injury patients (20%) returned to driving, one (25%) out of four patients with brain tumour resumed driving, by different health care professionals with no standardised measure uniformly available.

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DISCUSSION

One of the greatest difficulties in planning for care of long-term neurological disorders in Brunei Darussalam is the paucity of data demonstrating impact of disability caused by this group of conditions. The importance of further population-based studies into stroke incidence and outcome in our local setting has been highlighted. 8 This is the first study in our local setting on driving after ABI, a measure that could be used to quantify disability.

It has been suggested that non-resumption of driving is associated with poorer community integration after ABI. 3,5 It is noteworthy that 40 (58.8%) patients who were driving prior to ABI in this study were under the age of 60 years. Whilst non-resumption of driving is important at all ages for maintaining independence, for the under 60 age group there are further implications of not driving related to employment and driving for other family members.

A number of reasons could be postulated for this low figure of non-resumption of driving in our local setting and thus this exploratory study needs to be interpreted cautiously. Nevertheless, this result is important because often, studies into ABI focus primarily on mortality which may be misleading whereas this study suggests a poorer rehabilitation outcome. One reason for this low rate of non-resumption of driving could be the severity of traumatic brain injuries in our local setting. However, this could not be confirmed in this study as this data was not available. Another possibility is a poor medical outcome following injury. Finally, cultural influences may play an important role. The Bruneian culture is greatly family-orientated and after illness persons may tend to be more dependent on their families.

Our study was small with only 150 patients at the outset and of these only 68 had driving licenses prior to their injuries. The

<table>
<thead>
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<th>Parameters</th>
<th>Overall n (%)</th>
<th>Resumed driving n (%)</th>
<th>Not resumed n (%)</th>
<th>p value</th>
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<tr>
<td>Gender</td>
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<td></td>
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</tr>
<tr>
<td>Male</td>
<td>54 (79.4)</td>
<td>13 (86.7)</td>
<td>41 (77.4)</td>
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<td>Female</td>
<td>14 (20.6)</td>
<td>2 (13.3)</td>
<td>12 (22.6)</td>
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<tr>
<td>Age group</td>
<td></td>
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<tr>
<td>18-39</td>
<td>12 (17.6)</td>
<td>4 (26.7)</td>
<td>8 (15.1)</td>
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<tr>
<td>40-59</td>
<td>28 (41.2)</td>
<td>7 (46.6)</td>
<td>21 (39.6)</td>
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<tr>
<td>60-74</td>
<td>23 (33.8)</td>
<td>4 (26.7)</td>
<td>19 (35.8)</td>
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<tr>
<td>&gt; 74</td>
<td>5 (7.4)</td>
<td>0 (0)</td>
<td>5 (9.4)</td>
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</table>

12 (20.7%) out of 58 stroke patients resumed driving and the only patient in the study with brain infection (100%) recommenced driving (Figure 1).

Neither age nor gender were not significant predictors of resumption of driving (Table 1).
group was heterogeneous and notably some diagnoses were less common than others e.g. only one patient with brain infection and hence it is difficult to infer degree of disability following a specific injury. As a group, it does appear that resumption of driving after ABI in our local setting is poor with only 22% of Bruneians after ABI who resume driving. This is a considerably lower figure than from studies elsewhere. 5, 6, 7

It must be acknowledged that this was a select group of patients taken only from those attending for OT. It is possible that those with less severe injuries were not referred for therapy and that this group is likely to have returned to driving. However studies elsewhere were done on similar selected populations. Another limitation of this study was that the time from the injury could not be accurately defined in all the patients due to the retrospective nature of our study. In all patients however, the injury occurred at least three months prior to data collection. It is possible that given longer term follow-up these patients may subsequently return to driving.

In conclusion, it is vital that disability following neurological injury is studied further. The impact of long-term care of such patients is substantial ranging from costs of care to loss of income to medical sequelae of long-term disability. This small preliminary study has demonstrated a further need for large scale study to investigate the association of type and severity of injury with subsequent activities of daily living (ADL), independence, community integration, views on independent driving and underlying reasons for poor rehabilitation potential.

REFERENCES