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Glasgow Coma Scale, a Predictor Factor toward Return to Work among Patients with Mild and Moderate Head Injury

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ABSTRACT

Most patients with mild or moderate head injury have been experiencing symptoms of disability for several weeks to months, which can interfere with the ability of return to work or perform social activities. Mild and moderate head injury causes reversible lesions with complaints, and the complaint should be used as preliminary data from the physical signs of the basis for subsequent action. This study aims to determine the prognostic value of acute injury characteristics based on GCS score on admission toward the ability return to work among patients with mild and moderate head injury. This research is non-experimental, with a cohort prospective research design, involving 60 patients with mild and moderate head injury who admitted in the emergency department Tugurejo Semarang General Hospital from July 2012 - February 2013. The results of this study showed there was a significant correlation between GCS score with the ability return to work at 1 month, 3 months and 6 months post-treatment in a hospital (p=0,000), with positive correlation direction. For nurses are expected to use the GCS score which is a predictor for mild and moderate TBI patient outcome, and obtain priority treatment at the hospital with appropriate procedure immediately. With proper handling the GCS score is expected to provide economic value to patients by shortening the length of stay.

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INTRODUCTION

Some patients with mild to moderate head injuries continue to experience symptoms of disability during this period, which interfere with their ability to return to work (Englander, Hall, Stimpsons, et al., 2002). Several previous studies have emphasized the hypothesis that although mild brain injury causes reversible lesions with the complaints, these complaints should be used as the beginning of basic physical signs (Rutherford, 2007). In previous studies, GCS was used to define the severity of head injury patients (Alexander, 1995). Patients with GCS 9–12 were classified as having a moderate head injury, whereas patients with GCS 13–15 had a mild head injury (van der Naalt, van Zomeren, Sluiter, & Minderhoud, 1999).

Although neuropsychological damage is fundamental in patients with mild to moderate head injury, usually improving within 3 months, patients may still experience deficits in attention and memory (Hugenholtz, Stuss, Stethem, et al., 2000). Finally, in contrast to severe head injuries, based on the existing literature on mild and moderate head injuries, there is no agreement in determining the predictive value of acute injury characteristics such as GCS scores on the outcomes of nursing and health care (Kibby & Long, 2000).

Based on the reasons above, it is important to conduct research to determine the long-term outcome of patients with mild to moderate head injury which includes the ability to work again based on GCS scores at hospital admission: 9–15 ignoring length of hospital stay. This research was conducted at the Hospital Tugurejo Semarang for this reason, Tugurejo Hospital Semarang is one of the hospitals located on the congested north coast vehicle route that connects the city of Semarang with Jakarta which often receives deliveries of head injured patients in the emergency department due to traffic accidents. The purpose of this study was to determine the prognostic value of the characteristics of acute injury based on the GCS score at hospital admission and the ability to return to work in patients with mild to moderate head injuries.

METHODS

This type of research is non-experimental, with a cohort prospective research design, with the independent variables being GCS scores. The dependent variables of the study was ability to return to work measured at 1 month, 3 months, and 6 months after hospitalization due to mild and moderate head injuries. This research was conducted at the General Hospital Tugurejo Semarang in the Emergency Department from July 2012 – February 2013. The research sample inclusion criteria include mild and moderate head injury patients aged between 20 and 65 years,

GCS scores at hospital admission were between 9–14. Mild head injury was determined by a GCS score at hospital admission of 13–15, and moderate head injury was determined by a GCS score at hospital admission of 9–12. The sampling technique used is total sampling with a sample of 60 respondents.

GCS score at hospital admission was obtained from the patient's medical records based on the assessment of the physician in the emergency department who were assessed as part of the neurologic examination. After returning from treatment at the hospital, follow-up was carried out at regular intervals, namely: 1 month, 3 months, and 6 months after the injury by visiting respondents to their respective homes. At each follow-up visit, respondents were interviewed in a structured manner using a list of questions containing the ability to work again developed by van der Naalt, van Zomeren, Sluiter, and Minderhoud (1999). Ability to return to work is determined based on: the respondent returns to his original job; return to the previous job but with lower demands or part time; not returning to the previous job, different jobs at a lower level of ability; and not working.

Frequency analysis was performed for the variables of gender, age, and type of head injury. Data related to ability to work 1 month, three months, and 6 months after the injury were analyzed by non-parametric test (Friedman test) based on the distribution of the data obtained. Pearson's correlation coefficients were used to examine the relationship between GCS scores at hospital admission with the client's ability to return to work.

RESULTS AND DISCUSSION

Result

The research respondents were 60 patients with mild head injury and moderate head injury based on criteria when admitted to the hospital emergency department.

Table 1. Frequency distribution based on the characteristics of respondents at the Tugurejo Regional General Hospital, Semarang.

No.	Characteristics	Frequency	Percentage (%)
1.	**Gender:**		
	Man	41	68,3
	Woman	19	31,7
2.	**Age:**		
	20 – 45 years	49	81,7
	>41 years	11	18,3
3.	**Type of head injury:**		
	Mild head injury	43	71,7
	Moderate head injury	17	28,3

From table 1 it can be seen that most of the respondents are male (68.3%), the most age range is 20-45 years (81.7%), and based on the type of head injury the majority of respondents experienced mild head injury (71.7%).

Table 2. Relationship between GCS scores and Respondents' ability to return to work at the Tugurejo Hospital, Semarang.

Ability to return to work	GCS scores	
	Correlation Coefficient	p-value
1 month	0.881	0,000
3 months	0,881	0,000
6 months	0,756	0,000

From table 2 it can be seen that there is a significant relationship between GCS scores and the ability to return to work at 1 month, 3 months and 6 months after hospitalization for patients with mild and moderate head injuries, where each has a p value = 0.000, with a very strong relationship strength (between 0.800 – 1,000) on the ability to return to work 1 and 3 months after treatment, while the ability to return to work 6 months after treatment has a strong relationship (0.756), and the direction of the relationship is positive, which means the better the GCS score the better the ability to return to work.

Table 3. Statistics Test on Ability to Return to Work on Respondents with mild and moderate head injury at the Tugurejo Hospital Semarang.

N	60
Chi-Square	79.342
df	2
Asymp. Sig.	.000

Table 3 shows that the results of the Friedman test on the ability to return to work 1 month, 3 months, and 6 months after treatment for mild-moderate head injury obtained a p value = 0.000, because the p value <0.05, it can be concluded that there is a significant difference in the ability to return to work on the two measurements. To find out which measurements show differences in the ability to return to work, a post hoc analysis is carried out, the results are as follows:

Table 9. Test Statistics[b]

	Ability to return to work 3 months after trauma - Ability to return to work 1 month after trauma	Ability to return to work 6 months after trauma - Ability to return to work 1 month after trauma	Ability to return to work 6 months post-trauma - Ability to return to work 3 months post-trauma
Z	-5.657[a]	-6.652[a]	-4.939[a]
Asymp. Sig. (2-tailed)	.000	.000	.000

Table 9 shows that with the Wilcoxon test, p value = 0.000 was obtained for the comparison of all groups/ability to return to work, so it can be concluded that:

1. The ability to return to work 3 months after mild and moderate head injuries treatment is different from the ability to work 1 month after treatment.
2. The ability to return to work 6 months after mild and moderate head injuries treatment is different from the ability to work 1 month after treatment.
3. The ability to return to work 6 months after mild and moderate head injuries treatment is different from the ability to work 3 months after treatment.

Discussion

The result of the research shows that 68.3% are male, the most age range is 20-45 years (81.7%), and 71.7% respondents experienced mild head injury. Thornhill, Teasdale, Murray, McEwen, and Roy (2000) conducted research in five hospitals in Glasgow England showed that 1255 (42%) respondents were men, aged 40 years or less, 575 (19%) and most (90%) were classified as having had a mild head injury. Based on the results of research by van der Naalt, van Zomeren, Sluiter, and Minderhoud (1999) it is known that 43 respondents were male and 24 respondents were female with an average age of 33.2 years, and 24 patients had moderate head injury, and 43 patients had mild head injury. Asrini (2008) mentioned of fifty-nine patients with mild-moderate head trauma, consisting of 42 men (71.2%) and 17 women (28.8%). From these previous studies, it can be concluded that the majority of respondents who experienced mild and moderate head injuries were male and most suffering from mild head injuries. This condition occurs because it is possible that the habits / culture of men in Indonesia are the backbone of the family who have to earn a living by doing activities that are prone to accidents.

The research also shows that there is a significant relationship between GCS scores and the ability to return to work at 1 month, 3 months and 6 months after hospitalization for patients with mild and moderate head injuries, where each has a p value = 0.000, with a very strong relationship strength (between 0.800 – 1,000) on the ability to return to work 1 and 3 months after treatment, while the ability to return to work 6 months after treatment has a strong relationship (0.756).

Based on the results of a previous study by Asrini (2008) from fifty-nine mild-moderate head trauma patients, the results showed that GCS was one of the predictors of post-traumatic functional and neurobehavior outcomes that had an impact on the work ability of post-head injury patients ($p<0, 05$). Based on the evaluation of previous studies on the relationship between GCS scores and intracerebral contusions with long-term outcomes, it has been suggested that the use of the term moderate traumatic brain injury (MTBI) should be limited to cases with loss of consciousness, and a GCS score of 15 (optimal) in six hours (Gronwall & Wrightson, 1975, cited by van der Naalt, van Zomeren, Sluiter, & Minderhoud, 1999). Asrini (2008) research on fifty-nine mild-moderate head trauma patients showed that GCS was one of the predictors of post-traumatic functional and neurobehavior outcomes ($p<0.05$).

Based on the results of research by van der Naalt, van Zomeren, Sluiter, and Minderhoud (1999) it was found that one year after the injury, 73% of the 67 patients had returned to their previous

work although most (84%) still submitted complaints. The most frequent complaints were headache (32%), irritability (34%), forgetfulness and lack of concentration (42%), and fatigue (45%). Based on the Glasgow Outcome Scale, 82% of clients recovered well and 18% had moderate disability. Forty percent of respondents experience cognitive problems, 48% percent have problems with behaviors that interfere with the client's ability to return to work. Meanwhile, other researchers explained that the duration of post-traumatic amnesia (r=-0.46) was not significantly associated with GCS at hospital admission (r=0.19).

CONCLUSION

There is a significant relationship between GCS scores and the ability to return to work at 1 month, 3 months and 6 months after treatment, with a very strong relationship on the ability to return to work 1 and 3 months after treatment, and on the ability to return to work 6 months after treatment.

the results of this research will provide evidence that the GCS score at hospital admission was a predictor for the outcome of mild and moderate head injuries patients which will have an impact on the ability to return to work in patients with mild and moderate head injuries. This factor needs to be considered in the treatment of patients in the hospital according to the procedure. By paying attention to this factor, it is hoped that it can provide economic value for patients by shortening the length of treatment.

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