



“COMPARISON OF GLASGOW COMA SCALE (GCS) AND FULL OUTLINE OF UNRESPONSIVENESS (FOUR SCORE) SCORE FOR PREDICTING THE OUTCOME OF TRAUMATIC BRAIN INJURY PATIENTS ADMITTED IN THE INTENSIVE CARE UNITS”

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Abstract:

Introduction:

TBI causes the permanent damage to the brain and patient may land up into coma or death. There are too many prognostic models have been used for predicting the patient outcome for three decades. Selecting and using an appropriate diagnostic tool is critical in the early stage for an appropriate decision about primary diagnosis, medical care, and prognosis. GCS and FOUR score is associated with worsening level of consciousness. The emergency medical services should use the early warning scores routinely in all cases for the early detection of high-risk situations

Objective of the study :

- To compare the outcome of Traumatic brain injury patients by using Glasgow coma scale and the Full Outline of UnResponsiveness score.

Methodology

A prospective Observational Non-experimental Quantitative study on 100 patients. Sample selected through non-probability convenient sampling technique. The data was collected using 2 standard tools Glasgow coma scale and Full Outline of UnResponsiveness score was used to assess the outcome of traumatic brain injury patients admitted in ICUs of MGM hospital and dental college Kamothe, Navi-Mumbai. critical care unit in selected hospital of Navi Mumbai.

Pilot study conducted followed by actual data collection done and analyzed by using kappa statistics and Pearson's Correlation Coefficient

Results:

Reliability is the degree of accuracy and consistency of an instrument in measuring an element it is intended to identify or measure with rater inter rater method GCS = 0.98 and for FOUR SCORE = 0.93. using kappa statistics. FOUR and GCS score is correlation by using Pearson's Correlation Coefficient student's unpaired 't' test is applied at 5% level of significance. The tabulated value for n=100. The statistical acceptable level of significance was 5%. The AUROC analysis for GCS and FOUR Score for predicting mortality among patients admitted in intensive care units were sensitivity was 100%, Specificity = 100%, Positive Predictive Value=100% and Negative Predictive Value=100% .

Conclusion

Even after getting discharge from the hospital, Neurological disabilities and psychological problems like depression, anxiety, and suffering are some other damage caused by TBI apart from physical damage by which individual is affected for long period of time. Hence, early prediction of the severity level is important for the proper and early management of the Traumatic brain injury for which both GCS and FOUR Score can be used in ICUs. The FOUR score can be reliably used in intensive care unit by staff and residents. Both FOUR score and GCS performed equally well, but the neurologic detail can be stated clearly in FOUR Score makes it more useful in management of traumatic brain injury patients.

Index Terms - Comparison, prediction, outcome, GCS, FOUR Score, TBI, mortality.

1 INTRODUCTION

The use of early warning scores can help the emergency medical services to differentiate traumatic brain injury patients with a high risk of deterioration. The emergency medical services should use the early warning scores routinely in all cases for the early detection of high-risk situations. Since many years GCS has become the goal standard to detect the level of consciousness. Despite its widespread use, the GCS has many limitations, including the impossibility to assess the verbal score in intubated or aphasic patients, and an inconsistent inter-rater reliability that are well documented in the literature. The main reason to develop the FOUR Score was the major shortcomings of the Glasgow Coma Scale.

1.2 Population and Sample

In this study population is all the patients present at critical care units at multi-specialist hospitals in navi Mumbai.

In this study, the sample means of the entire patient presented at DVT sign and all those patients admitted in the critical care unit during the period of data collection.

Sample size : It is the number of people who are included in study

A sample size of 100 was selected for the study

2 Data and Sources of Data

In this study non-probability, Convenient sampling technique was used to select the sample based on inclusion and exclusion criteria and this process is continued until 100 representative samples were collected.

3 RESEARCH METHODOLOGY

In general, the research approaches are:

- The approach is used for data collection
- The approach is used for data analysis and reasoning

The approach used for this research is the prospective observational method.

The research design used for the current study is a descriptive research design among patients at intensive care units of MGM hospitals at Kamothe, Navi Mumbai

This is a prospective observational quantitative study comparing GCS and FOUR Score.

In this study the data pertaining to GCS and FOUR Score was collected prospectively by obtaining data from a patient, records and monitor at intensive care units.

Descriptive Statistics

Descriptive statistics are typically distinguished from inferential statistics. With descriptive statistics you are simply describing what is or what the data shows. With inferential statistics, you are trying to reach conclusions that extend beyond the immediate data alone. For instance, we use inferential statistics to try to infer from the sample data what the population might think. Or, we use inferential statistics to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. Thus, we use inferential statistics to make inferences from our data to more general conditions; we use descriptive statistics simply to describe what's going on in our data.

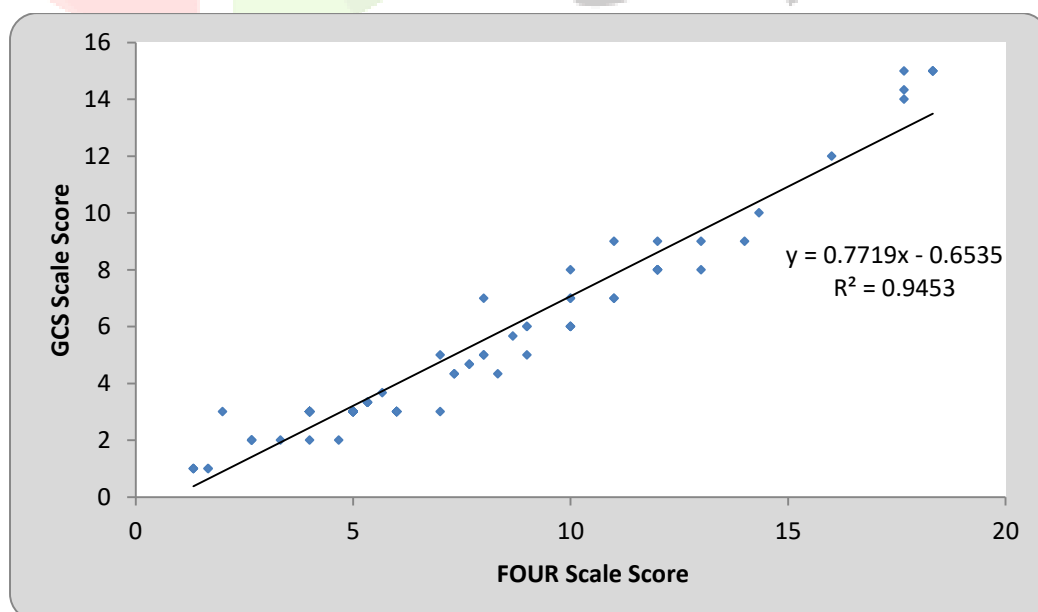
The software used in the analysis were SPSS 24.0 and Graph Pad Prism 7.0 version and $p < 0.05$ is considered as level of significance.

The statistical tests used for the analysis of the result were:

1. Pair 't' Test
2. Kappa statics
3. Pearson' Correlation Coefficient
4. Reliability Analysis

4 RESULTS AND DISCUSSION

1. Comparison of GCS and FOUR score



Note: ** $P < 0.05$, it is highly significant at 5 5 level. It is positively correlated. The Persons Correlation Coefficient (r) is 0.985. The above figure clearly represent that

there is positive comparison between GCS and FOUR score for traumatic brain injury patients.

Kappa Statistics for GCS and FOUR score

	Kappa statistics	p- value	Level of significance	Agreement
GCS	0.990	0.0001, S	100%	Strong Agreement
FOUR Score	0.991	0.0001,S	100%	Strong Agreement

By using Kappa statistics strong agreement was found for GCS score (Kappa = 0.990, p- value = 0.0001) and for FOUR score (Kappa=0.991, p=0.0001). This proves that both GCS and FOUR score are strong predictors of mortality.

5 Discussion

The main objective of this study is to predict the outcome of traumatic brain injury patient using GCS and FOUR score. There are many studies which is conducted using these tools as In this study the using rater inter rater method the reliability with kappa statistic was found of the tool GCS and FOUR Score. A similar study was conducted by Eelco FM Wijidicks were rater inter rater method the reliability with kappa statistic was used. In this study majority of the sample was 34 (34 %) of age group 16 -29 years. A similar study was conducted by Fleminger S, were majority of head injuries occur in age group of 15- 24 years.

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