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# Bedside Evaluation Of Outcome In Stroke Using NIHSS Score.

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**ABSTRACT**

Health care providers are asked to predict the outcome of stroke and quality of life after a stroke. Sound clinical judgement along with bedside scores helps in predicting the outcome of stroke. Aim of this study is to predict the outcome of stroke using National Institute of heath stroke scale (NIHSS SCORE) in 30 acute stroke patients. NIHSS score is calculated at the time of admission of patients and outcome is categorized as discharged as home independent (able to carry out their own activities) & discharged as home assistance. 6 patients were discharged home without need for assistance, 22 required assistance after discharge and 2 patients expired. This study shows NIHSS score at the time of admission predicts the outcome of stroke and increasing NIHSS SCORE increases the possibility of disability and death.

**Keywords** -National institute of health stroke scale (NIHSS), Severity assessment, Bedside score, Stroke score.

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## INTRODUCTION

Using NIHSS score, healthcare providers assess the severity of stroke. NIHSS score measures the neurological function and deficit by asking the person to answer questions and to perform several physical and mental tests. Using a numerical scale to determine the stroke severity, healthcare providers record the patient's performance in 11 categories [1]. The NIHSS is composed of 11 items, each of which scores a specific ability between a score of 0 and 4[2]. For each item, a score of 0 typically indicates normal function in that specific ability, while a higher score is indicative of some level of impairment. The individual scores from each item are summed to calculate a patient's total NIHSS score. The maximum possible score is 42, with the minimum score being 0. Other prognostic scores like Siriraj stroke score, Guys hospital score, Greek score, Bensons score, mRS score, Iscore, Plan score, Astral score are also used in predicting stroke outcome. [3] Traditionally, physicians have relied on their experience to predict the outcome, which may subject to bias, positive or negative. Validated scores shall not replace but rather compliment clinical judgement. The only way to figure out is to start using these evidence-based scores and gain some experience.

Strengths of these prognostic scores are 1) the inclusion of easy to collect variables, 2) mostly easily determinable within hours of hospitals presentation, and 3) their validation in large patient populations. NIHSS on the day of admission is useful in selecting the patients in whom early intervention-thrombolysis is beneficial (NIHSS Score 4-20).

## MATERIALS AND METHODS

This Prospective observational study was conducted at Government medical college & Hospital, Cuddalore.30 patients admitted with acute stroke are recruited for study from July 2024 to September 2024. Informed consent obtained from patients and from relatives (for drowsy and unconscious patients). Data was collected based on history of arm and leg weakness, facial weakness, speech disturbance, sensory disturbance), mode of presentation onset, duration, associated risk factors like diabetes mellitus, hypertension, smoking, alcoholism, coronary artery disease. CT brain findings (ischemic /hemorrhagic) noted, and the etiology of stroke (thrombotic/hemorrhagic) was determined. NIHSS score at the time of presentation were calculated and patients are categorized according to their severity based on their scores (0=No stroke symptoms, 1-4=Minor stroke ,5-15=Moderate stroke, 16-20=Moderate to severe stroke, 21-42=Severe stroke) [2] NIHSS score improved after effective management and outcome of the patients were determined based on their condition at discharge (discharged home independent or discharged with home assistance or in-hospital mortality).

Inclusion criteria: Patients admitted with acute stroke (ischemic and haemorrhagic) in Government Medical college & Hospital, Cuddalore with age above 18 years including both sexes.

Exclusion criteria: Recurrent stroke, 2) Tumour with bleed, 3) Unstable hemodynamic status, 3) Age <18 years.

## RESULTS

This study included 21 male patients and 9 female patients. Maximum number of patients were elderly-above 60 years (16 patients), 7 patients were between the age group of 51-60, 6 patients were in the age Group 41-50 and 1 patient is less than 40 years of age. Among them, 24 had ischemic stroke, 6 had hemorrhagic stroke. Hypertension, diabetes and smoking was found to be the commonest risk factor for stroke. Most common presentation was arm weakness, leg weakness, facial palsy followed by loss of consciousness, speech and sensory disturbance. Most of the patients (26 patients) on admission had moderate stroke (NIHSS 5-15), 1 patient had minor stroke, 1 patient had moderate to severe stroke and 2 patients had severe stroke. 6 patients discharged home independent, 22 patients discharged with home assistance and 2 patients expired.

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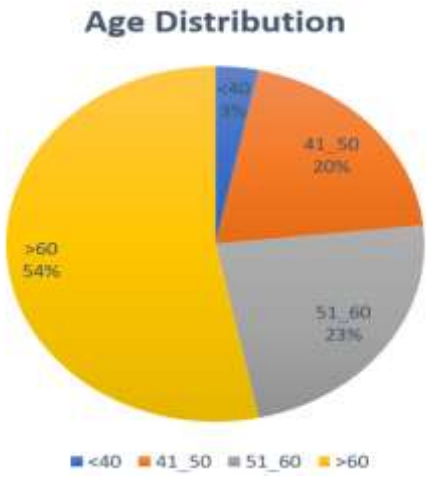
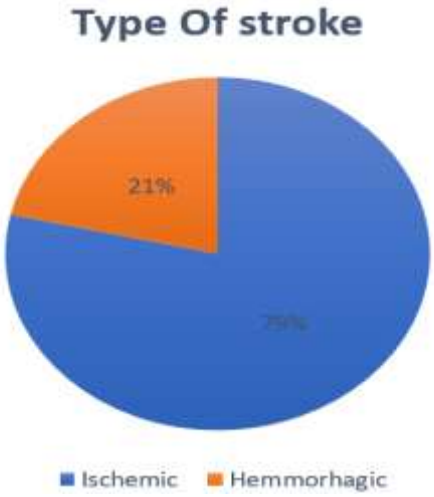
Graph 1: Age Distribution




**Graph 2: Type Of Stroke**




**Graph 3: Comorbidities Of Patients**

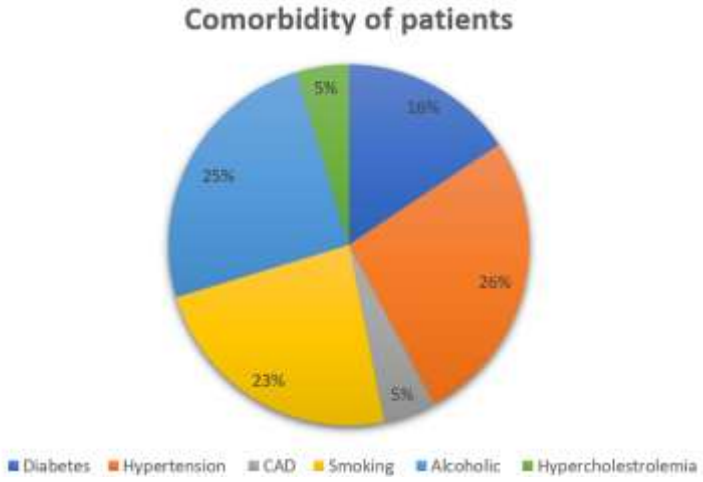


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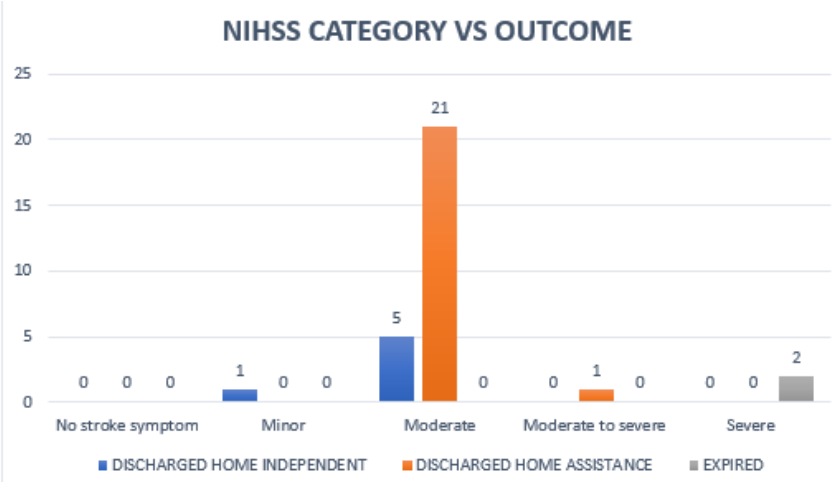
**Table 1: NIHSS Components**

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1a.Loc Responsiveness | 2 | 10 | 13 | 5 | - |
| 1b.Loc Questions | 1 | 24 | 5 | - | - |
| 1c.Loc Commands | 1 | 24 | 5 | - | - |
| 2.Horizonal Eye Movement | 15 | 10 | 5 | - | - |
| 3.Visual Field Defects | 22 | 5 | 3 | 10 | - |
| 4.Facial Palsy | 10 | 7 | 9 | 4- | |
| 5.Motor Arm | 2 | 5 | 7 | 11 | 5 |
| 6.Motor Leg | 2 | 2 | 7 | 11 | 5 |
| 7.Limb Ataxia | 50 | - | - | | - |
| 8.Sensory | 26 | 4 | - | - | - |
| 9.Language | 2 | 11 | 12 | 5 | 0 |
| 10.Speech | 2 | 23 | 5 | - | - |
| 11.Extinction And Inattention | 25 | 5 | - | - | - |

Graph 4: NIHSS Category


**Graph 5 NIHSS Category Vs Outcome**



## DISCUSSION

The NIHSS has been found to be an excellent predictor of patient outcome A baseline NIHSS score greater than 16 indicates a strong probability of patient death, while a baseline NIHSS score less than 6 indicates a strong probability of a good recovery. On average, an increase of 1 point in a patient's NIHSS score decreases the likelihood of an excellent outcome by 17%.[16] However, correlation between functional recovery and NIHSS scores was weaker when the stroke was isolated to the cortex.[17]In NIHSS Minor category, 1 patient was discharged without assistance. In NIHSS Moderate category 5 patients were discharged without assistance and 21 patients required assistance during discharge. In Moderate to severe category 1 patient was discharged with home assistance. Two Patients with score 21-42 (NIHSS severe) had expired predicting that score above 21 patients increased the likelihood of disability and death. In total 6 were discharged as home independent (able to carry out their own activities) & 22 patients were discharged as home assistance. Most of the patients came under NIHSS -moderate stroke. The NIHSS score strongly predicts the likelihood of a patient's recovery after stroke.

### Limitations

- Sample size small
- Inter-observer variation in performing NIHSS score
- Validity of NIHSS is reduced if the patient is intubated.
- It is difficult to make an accurate assessment of the NIHSS in altered mental status.

## CONCLUSION

In conclusion, The National Institutes of Health Stroke Scale (NIHSS) is a systematic, quantitative assessment tool to measure stroke-related neurological deficit. In clinical practice it can be used to evaluate and document neurological status in acute stroke patients and to determine appropriate treatment. The NIHSS has been shown to be a predictor of both short- and long-term outcomes of stroke patients. The NIHSS is designed to be a simple tool that can be administered in less than 10 minutes by physicians, nurses or therapists. Healthcare professionals can be trained to administer simple bed side scores like NIHSS for early recognition and effective management of stroke.

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