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Assessment of Knowledge Regarding Golden Hour of Stroke Among Individuals Attending Selected OPDs of a Tertiary Care Hospital

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Abstract

"Time is brain" highlights the urgency of stroke management, as millions of neurons are lost each minute following an acute ischemic stroke. Globally, stroke is a leading cause of death and disability, with a significant burden in India, where nearly 1.8 million cases occur annually. Early treatment within the "golden hour" is critical to reduce mortality and long-term neurological damage. However, public awareness regarding early recognition and timely intervention remains inadequate. This study aimed to assess knowledge regarding the golden hour of stroke among individuals attending outpatient departments of a tertiary care hospital in Kolkata. A descriptive research design was adopted with a sample of 100 participants selected through convenience sampling. Data were collected using a self-structured questionnaire after obtaining ethical clearance. Descriptive statistics were used to analyze knowledge levels, and the chi-square test was applied to identify associations between knowledge and demographic variables, with $p < 0.05$ considered statistically significant. The findings revealed that 62% of participants had moderate knowledge, 20% had high knowledge, and 18% had low knowledge regarding the golden hour of stroke. No significant association was found between knowledge levels and selected demographic variables. The study concludes that gaps in awareness regarding early signs, symptoms, and timely management of stroke persist. Strengthening community-based education and awareness programs is essential to improve early response, reduce delays in treatment, and minimize stroke-related morbidity and mortality.

Keywords: Golden hour, stroke, knowledge, awareness, early intervention

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INTRODUCTION

Stroke is defined by WHO as "Rapidly developed clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than that of vascular origin" [1]. 87% of strokes are associated with the formation of a clot in the artery supplying blood to the cerebral tissues, leading to a condition known as ischemic stroke [2]. It can also be caused by the rupture of blood vessels, thus preventing blood flow to the brain (hemorrhagic stroke). A temporary clot causes a transient ischemic attack (mini-stroke). The American Stroke Association defines Transient Ischemic Attack (TIA) as a transient episode of neurological dysfunction caused by focal brain,

spinal cord, or retinal ischemia without acute infarction [3–6]. In this case, the sooner the treatment is received, the more brain function can be preserved, and the less likely it is to be permanent brain damage. The longer the treatment is delayed, the greater the chance of significant deficits and the higher the likelihood that those deficits will be permanent.

For this reason, 60 minutes after the onset of stroke symptoms is known as "the golden hour." If treatment can be initiated within this brief window, the patient's outcome is likely to improve [4]. The first hour is considered to be the most crucial, or in other terms, "golden" because stroke patients have a high chance of survival and prevention of long-term brain damage if they receive medical treatment and drug therapy within the first 60 minutes of the onset of symptoms [7–10].

According to a study by the American Heart Association, every minute a stroke is untreated, the average patient loses 1.9 million neurons, 13.8 billion synapses, and seven miles of axonal fibers. With each hour in which treatment fails, the brain loses as many neurons as it does in almost 3.6 years of normal aging [7, 11–14]. Lansberg et al. examined the pooled dataset of the first six major randomized acute stroke trials of intravenous tissue plasminogen activator to identify the number needed to benefit (NNB) and the number needed to harm (NNH). They found that NNB was 3.6 for patients treated between 0 and 90 minutes, 4.3 for treatment between 91 and 180 minutes, 5.9 for treatment between 181 and 270 minutes, and 19.3 for treatment between 271 and 360 minutes. The NNH estimates for the corresponding time intervals are 65, 38, 30, and 14. The analysis clearly showed that earlier treatment was linked to a greater chance of benefit and reduced chance of harm. It also showed that treatment up to a 4.5-hour window resulted in more benefit than harm [8, 15–18].

This study will provide significant information about the awareness of individuals regarding the golden hour of stroke. This will help healthcare workers plan and implement various educational strategies to provide knowledge related to early identification of warning signs and symptoms of stroke, prevention of stroke, prompt management of the stroke episode, and the importance of the golden hour of stroke. Public education promotes awareness of the seriousness of stroke and the urgency of stroke evaluation, and a narrow therapeutic window may lead to changes in behavior and attitude. Improved knowledge and changed attitude will advance the practice of stroke management, thereby reducing the burden of stroke in India and developing countries [12, 19–20].

MATERIALS AND METHODS

A descriptive research design was used in this study. Details and relevant information were collected from the participants using a self-administered tool. For this study, the target population was people attending outpatient departments (OPDs) in a selected tertiary care hospital. The accessible population for this study included individuals attending OPDs who responded to the self-structured tool during the research. The sample size was estimated from the research findings of a study using Cochran's formula. The following assumptions were made for a margin of error of 10% with 95% confidence intervals and $\alpha = 0.05$ (level of significance). The estimated sample size was 96 with a 95% CI; however, a total of 100 subjects were included in the study. Ethical clearance was obtained from the ethics committee of our college. Formal written permission was obtained from the concerned authorities of the hospitals in which the research was conducted. Written consent was obtained from all the participants prior to data collection.

The study included all participants who attended OPDs throughout the data collection period and who could comprehend English, Hindi, or Bengali. They had to be over the age of 18 years and under the age of 70 years. The study excluded all who were unable to understand English, Hindi, or Bengali, were classified as a case of mental illness, had an acute illness, had a stroke, or were unable to respond to the questionnaire due to any neurological problems. Convenience sampling was used to select the samples. The samples were screened based on inclusion and exclusion criteria. A code number was assigned to each subject, and the recording of each aspect of the study was ensured by the researchers. Individuals needed to understand the procedure for their willingness to participate in the study. The

individuals were briefed by providing an overview of what the research was about. The target population was identified, and eligible samples were selected according to the inclusion criteria.

A self-structured questionnaire was used as the primary data collection tool. It was chosen for its efficiency in gathering information from a large sample and its ability to capture participants' knowledge and background details directly. The items in the questionnaire were developed after an extensive review of the literature related to knowledge on the golden hour of stroke and subsequently validated through expert consultation. The tool was constructed considering the nature and objectives of the study, the characteristics of the target population, and the time frame available for data collection. The questionnaire was divided into two sections. This section collected detailed information regarding participants' sociodemographic characteristics. It includes variables such as age, sex, marital status, monthly income, educational status, and occupation. Items related to personal habits (smoking, alcohol intake, and tobacco use) were also included. The participants' comorbid conditions, general awareness of stroke, and family history of stroke were also assessed. Section II focuses on evaluating the participants' knowledge of stroke. It covered core components, such as the definition and causes of stroke, signs and symptoms, possible complications, and overall understanding of stroke management. Special emphasis was placed on assessing knowledge related to golden hour, including its importance and implications for treatment outcomes.

A permission letter was obtained by the researcher from the head of the institution to conduct the study at the hospital. People visiting OPDs were informed of the nature of the study, and written informed consent was obtained from all participants. Conveniently, 100 samples that fulfilled the inclusion criteria were approached. Self-introduction was provided, and rapport was established by the respondent. The subjects were briefed, and the purpose of the study was explained to them. Written consent was obtained from all subjects. The data collection was done via the administration of a self-structured questionnaire. The participants were asked to complete the questionnaire and submit their responses. Coding of the collected data was simultaneously performed by the researcher. The following steps were considered and adhered to during data collection. Written informed consent was obtained from the participants who were willing and eligible for the study. Separate code numbers were used along with the inclusion criteria for participating in the study. Care was taken to ensure that there was no contamination of the sample by administering individualized questionnaires to the respondents. The respondents were informed of the research before administering the questionnaire. They were provided with a sociodemographic proforma and knowledge questionnaires. All data were recorded using an Excel sheet. Confidentiality was assured to all subjects. To prevent sample contamination, participants were instructed to complete the questionnaire and not discuss their responses. People attending were approached individually, along with Hindi and English tools, and filled in on pen and paper on the spot. No probing was performed during data collection to prevent bias. The questionnaires were collected after ensuring that all responses were marked by the participants. It took approximately 10 minutes for participants to complete the questionnaire, and on average, data from 20 participants were collected in a day. The data collected were organized and analyzed according to the guidelines of experts from biostatistics.

Results

The data showed that the majority of participants were in the age group of 30–39 years (29%), followed by those aged 18–29 years (25%). Only a small proportion (15 %) belonged to the older age group of 60–69 years. This indicates that most of the respondents were young to middle-aged adults. With respect to sex distribution, 62% were male, and 38% were female, with male predominance in the study sample. Regarding occupation, a considerable number of participants were homemakers (35%), followed by professionals (33%), and skilled workers (22%), while unskilled workers constituted the smallest group (10%). This finding suggests that the sample included participants from a range of occupational backgrounds. In terms of educational status, the highest proportion was graduates and above (40%), while 33% had completed higher secondary education. Only 8% had an education up to the elementary level. This reflects that the majority of the participants were relatively well educated.

Resident data showed that 64% of the participants resided in urban areas, while 36% resided in rural areas. Only 25% reported a family history of stroke, while the majority (75%) did not. A large proportion (59%) reported regular visits to a doctor, indicating good health-seeking behavior in more than half of the sample. Regarding health issues and personal habits, hypertension (21%) and diabetes (17%) were the most commonly reported comorbidities. Habits, such as smoking (5%) and alcohol consumption (7%), were reported in a smaller portion of the group. Cardiovascular disease was reported by 6% of participants, while 55% reported no significant health issues or habits. Overall, the findings indicate that the sample primarily consisted of young to middle-aged, educated, urban residents with a moderate prevalence of common lifestyle-related health conditions (Figure 1).

Data analysis was conducted on awareness of the golden hour of stroke using a self-structured questionnaire with 14 items. The individual scores were classified as low, medium, or high.

The analysis of participants' knowledge regarding stroke and golden hour showed that the majority of respondents (62%) demonstrated a moderate level of knowledge, with a mean score of 12.0963. This indicates that most participants had a fair understanding of stroke-related concepts but still lacked comprehensive knowledge in certain key areas (Figure 2).

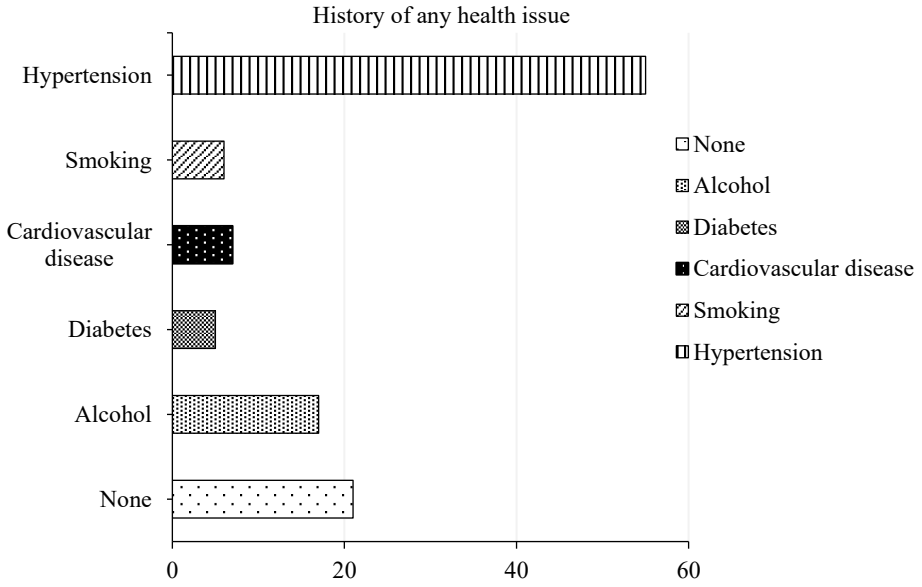

Figure 1. Distribution of subjects as per history of any health issue/habit.

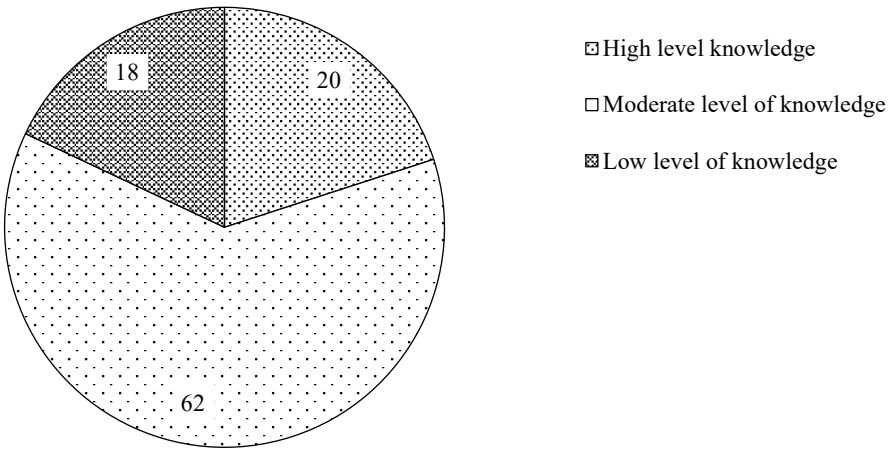

Figure 2. Distribution of Level of Knowledge.

A small proportion of participants (20%) exhibited a high level of knowledge, with a mean score of 18.9, suggesting that only one-fifth of the sample possessed strong and well-informed awareness about stroke, its warning signs, complications, and the importance of golden hour. Conversely, 18% of participants had a low level of knowledge, with a mean score of 6.722, indicating significant gaps in understanding that may hinder early recognition and timely action during a stroke event.

Overall, the findings reflect that, while most participants have a moderate understanding, there remains a considerable need for educational interventions to improve public awareness, especially to increase the proportion of individuals with high-level knowledge and reduce those with low awareness.

Association of the Level of Knowledge with Sociodemographic Variables

The association of knowledge of the golden hour of stroke with demographic variables (age, sex, occupation, education, place of residence, family history of stroke, regular visit to a doctor, history of health issues, or habits contributing to stroke) was performed using the Pearson chi-square test. In the present study, there was no significant difference in the association between sociodemographic variables and knowledge of the golden hours of stroke. All tests were performed at a 95% Confidence Interval.

DISCUSSION

One hundred participants were assessed in this study. Analyzing the demographic data of the subjects, it was seen that out of 100 participants, 29% fell under this age group (30–39). The mean age of the participants did not vary statistically (50–70 years), affirming that the subjects were drawn from a homogenous sample in terms of age. Considering the sex distribution of the participants, the majority were male (62%). The study showed that 64% of participants belonged to an urban community. The study showed that 40% of participants were graduates and above 65% of all participants were working, and 35% were homemakers. The present study assessed knowledge of stroke among individuals using a self-structured questionnaire, revealing that 18% of the participants demonstrated a low level of knowledge, 62% had a moderate level, and 20% exhibited a high level of knowledge. These findings indicate that while a majority of participants possess some awareness of stroke, their understanding is not comprehensive, highlighting critical gaps that may delay the recognition of early symptoms and appropriate response.

These findings align with those of previous studies conducted in various international settings. A study in Iraq reported that approximately 21% of the participants achieved high knowledge regarding stroke, similar to the 20% observed in this study. In Ghana, awareness of stroke signs ranged between 25.9%–47.2%, with 24%–39% recognizing risk factors, indicating comparable gaps in understanding. Studies from China (Chengdu) and Ethiopia (Jimma Town) highlighted low baseline awareness, which improved significantly after structured educational interventions, thus emphasizing the potential impact of targeted health education. In the present study, there was no significant difference in the association between sociodemographic variables and knowledge of the golden hours of stroke. In contrast with the present study, some studies have reported that knowledge of age >50 years and male sex have a certain association with sociodemographic variables. A nationwide population-based study was conducted to describe the association between knowledge regarding stroke and various sociodemographic variables among 526 patients.

Implications of the Study

These findings underscore the need for comprehensive community-based educational interventions to enhance stroke awareness. Programs should focus on improving the recognition of early warning signs, understanding risk factors, and emphasizing timely medical interventions. Tailored strategies should target individuals with low knowledge, while reinforcing messages among those with moderate knowledge, to elevate them to a high knowledge level. Incorporating behavioral components, such as encouraging immediate action when symptoms are recognized, can further improve outcomes because knowledge alone may not guarantee an appropriate response. Future research should explore the

demographic, social, and cultural factors influencing stroke knowledge and investigate whether increased awareness translates into effective preventive behaviors and timely healthcare-seeking. Understanding these determinants will allow for the design of more effective, context-specific interventions.

Limitations and Strengths of the Study

The study was limited to selected OPDs in a tertiary care hospital, thus restricting its generalizability. Potential confounding factors such as prior knowledge, media exposure, hospital visits, and personality traits may have influenced the results. The small sample size and use of non-probability convenience sampling, along with sequential non-random participant assignment, may have affected representativeness and internal validity. This study introduced the novel concept of the "golden hour" of stroke, emphasizing early recognition and intervention. It assessed knowledge using a self-structured tool with a descriptive, non-experimental design, providing valuable baseline data despite the lack of manipulation or randomization.

CONCLUSION

The research study titled "A study to assess the knowledge regarding golden hour of stroke among individuals attending selected OPDs of a tertiary care hospital, Kolkata" was conducted following the steps of a quantitative research study. A descriptive study was conducted for one week among 100 individuals attending selected OPDs of the tertiary care hospital of Kolkata to assess their knowledge of the golden hour of stroke. As per the delimitations, samples were selected using non-probability convenience sampling while they attended routine checkups. In conclusion, this study highlights a moderate level of stroke knowledge among the majority of participants, with a smaller proportion having high awareness. A comparison with global studies suggests similar patterns of knowledge gaps, emphasizing the need for targeted educational initiatives to enhance both awareness and practical responses to stroke. Strengthening community education and promoting behavioral changes are crucial for reducing stroke-related morbidity and mortality.

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