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Research Article

STRUCTURE OF MORTALITY AMONG CVA PATIENTS ADMITTED IN MEDICAL WARD 6 OF DHQ/TEACHING HOSPITAL, GUJRANWALA

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Abstract:

Background: Interruption in blood supply to all or part of the brain, resulting in temporary or permanent damage to that part with variable neurological consequences depending upon the part involved called stroke or CVA presents with a variety of neurological signs and symptoms and poses great challenges to our healthcare delivery systems as the disease is both preventable and treatable. The earliest possible action can prevent permanent damage to the part of the brain affected and the complications that follow. Having data regarding stroke mortality can help in monitoring disease trends and planning effective public health interventions.

Objective: To assess the structure of mortality and to determine correlation with different co-morbidities in patients with stroke/CVA in DHQ/Teaching Hospital, Gujranwala.

Materials and Methods: This is a descriptive cross-sectional study, performed on 199 patients who were diagnosed as having CVA and admitted in Medical Ward 6 of DHQ/Teaching Hospital, Gujranwala, between February 2018 and July 2018, chosen by the convenient sampling technique. Data regarding the demographic features of these patients along with their presenting complaints, diagnoses, whether new or recurrent, and whether ischemic or hemorrhagic, and their direct cause of death was collected via structured proformas and analyzed.

Results: A total of 1095 patients were analyzed, out of which 199 (18.2%) were diagnosed as CVA. Out of these, 42.7% (85) were males and 57.3% (114) were females. The male to female ratio was 1:1.3. Mean age of occurrence was 65.8 years with an SD of ± 16.03 . Mean (SD) stay of duration was 3.4 days (± 2.39). HTN was the commonest co-morbid condition found in 144 (72.4%) patients, while DM, previous CVA, CLD, and CKD were found in 78 (39.2%), 67 (33.7%), 11 (5.5%), and 2 (1.01%) respectively. The mortality rate was 22.11% and the commonest causes of mortality were brain death, aspiration pneumonia, and septic shock.

Conclusions: Stroke/CVA is one of the leading causes of mortality in our settings, and HTN and DM are the commonest risk factors associated, which can be explained by poor health services, lack of awareness regarding primary and secondary prevention, and low levels of compliance with treatment.

Keywords: mortality, stroke/CVA, DHQ/Teaching Hospital, Gujranwala

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INTRODUCTION:

One of the leading causes of mortality, stroke, or cerebrovascular accident – abbreviated as CVA – is defined as the occurrence of sudden focal non-convulsive neurological deficit as a result of interruption in blood flow. [1][2]

About 700,000 strokes occur in the US per year, resulting in 165,000 deaths, i.e. 1 out of every 20 deaths. [3][4] Being the second leading cause of death worldwide, CVA is a major health problem with increasing significance as a person ages. The risk of CVA also increases by 30% in a patient who has had a transient ischemic attack (TIA) or a previous CVA. [4]

Though mainly affecting the older population, about 10% of cases occur in patients <50 years of age. [1]

Among the patients experiencing a stroke in the US every year, 610,000 are new cases of CVA, while 185,000 i.e. 1 of 4 are recurrent episodes. Overall, CVAs cost the nation an estimated \$34 billion per year. Besides mortality, CVA is also one of the leading causes of long-term morbidity, reducing mobility in over 50% of CVA survivors aged 65 and above. [3]

CVA is either of two types: **ischemic** (87%) – when the blood supply to all or part of the brain is blocked, due to thrombosis or embolism – and **hemorrhagic** – when a blood vessel supplying all or part of the brain is ruptured. The obstruction in the former case may be brief resulting in short-lived symptoms that fade after a period of minutes to hours; such episodes are known as transient ischemic attacks (TIAs). Both mechanisms result in the part of the brain being deprived of blood and oxygen, leading to cell death. [3][5]

Among risk factors, the ones CVA has been found to be more strongly related to are an increasing age, male gender, black race (about twice as high than for whites, and also the highest mortality rates following CVA), diabetes, hypertension, heart disease, and smoking. Use of medications that lower serum cholesterol has been negatively linked to the incidence of CVA. [3][6]

With variable signs and symptoms depending upon the part of the brain affected, the diagnosis is mostly clinical, based upon the neurological examination of the patient, then confirmed by CT – the investigation of choice, and MRIs, ECGs, echocardiograms, carotid ultrasound, and blood investigations follow as required. [5]

The goal of management in case of an ischemic CVA is to restore the blood supply within the obstructed vessel, while that in hemorrhagic CVA is to halt the bleeding. [5] The duration of recovery after a CVA depends upon the severity at presentation in terms of the type of CVA, the size of the lesion (infarct or hemorrhage), the degree to which the part of the brain was affected, the severity of the neurological deficit, how soon the treatment was initiated, and the overall health status of the patient. [4][7] The prognosis of CVA depends largely on two factors: age of the patient and the severity of the stroke. [4]

The overall mortality in CVA is usually high; 4.9% and of late-onset in ischemic CVA and 18% and usually of early-onset in hemorrhagic CVA, out of which 50% occur due to complications during hospital stay. The most significant predictors of mortality as per studies include complications such as delay in the regaining of consciousness and new-onset aspiration pneumonia and acute MI/CCF. [7] Those who survive commonly end up with difficulties in speech, moving, swallowing, or thinking. These may remain the same or may improve over weeks, months or even years following the attack through rehabilitation. [5]

In general, patients with CVA who make it to an emergency department within 3 hours of having experienced their first symptoms have lesser morbidity 3 months post-CVA as compared to those who arrive later than 3 hours. [3] Delay in care is usually due to lack of awareness of the symptoms by the patient's attendants. Only about 38% of people know when to act and rushing the patient to the hospital. [3] Clinical studies reveal a 5-year survival rate of only 50% among patients with CVA. [4] The substantial socioeconomic burden associated with CVA warrants immediate and appropriate management. [2]

Despite studies for the past two to three decades, there is no uniform consensus about the most significant predictors for CVA mortality, which can aid healthcare systems in reducing the overall burden of CVA in the society. [7][8]

Identification of risk factors and predictors of mortality associated with CVA can help improve mortality by an estimated 20%. [4] Data regarding mortality due to CVA also plays a key role in monitoring disease trends and formulating public health interventions. Furthermore, CVA mortality is an important outcome measure in CVA clinical trials and epidemiology studies, as in this study. [9]

MATERIALS AND METHODS:

Study Design: The research is a descriptive cross-sectional study.

Setting: The study was conducted in Medical Ward 6 of DHQ/Teaching Hospital, Gujranwala.

Duration of Study: The study duration spanned over one year (June 2017-June 2018).

Sample Size: The study in question included a total number of 1095 patients.

Sampling Technique: The study was conducted using the simple random sampling technique.

Sample Selection:

- **Inclusion Criteria:** The study included all patients admitted in Medical Ward 6 diagnosed as having a stroke/CVA.

- **Exclusion Criteria:** The study excluded all patients admitted in Medical Ward 6 diagnosed as having a disease other than a stroke/CVA.

Data Collection Procedure: Data for the study was collected through a questionnaire regarding the demographic data, presenting complaints, type of CVA diagnosed, existing co-morbidities, number of expiries, and the main cause of death in patients admitted with CVA.

Data Analysis Procedure: Qualitative plus quantitative data was analyzed via the SPSS-19 software.

RESULTS AND DISCUSSIONS:

A total of 1095 patients admitted between June 2017 and June 2018 were studied for the purpose. Out of these, 199 (18.2%) patients were diagnosed as having stroke/CVA.

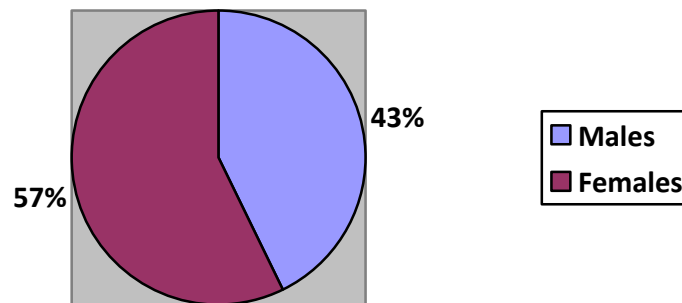


Chart 1. Gender Distribution of CVA

The sample included 85 males and 114 females. The male to female ratio turned out to be 1:1.3.

117 (58.8%) patients presented with the ischemic type while 82 (41.2%) patients were diagnosed as having hemorrhagic CVA.

The mean age of occurrence of CVA was 65.8 years with a standard deviation (SD) of ± 16.03 years.

The mean (SD) duration of hospital stay was 4 days (± 2.39).

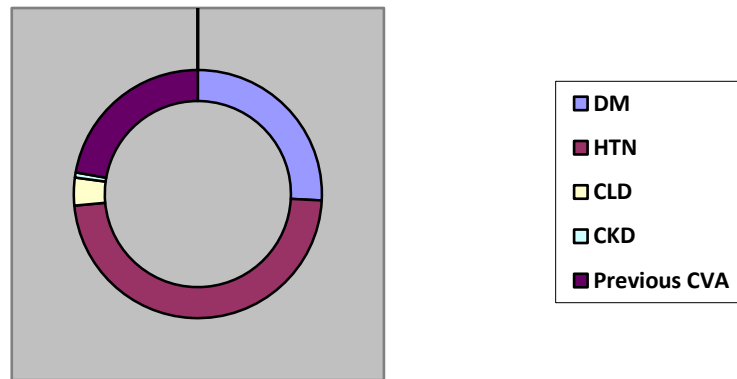
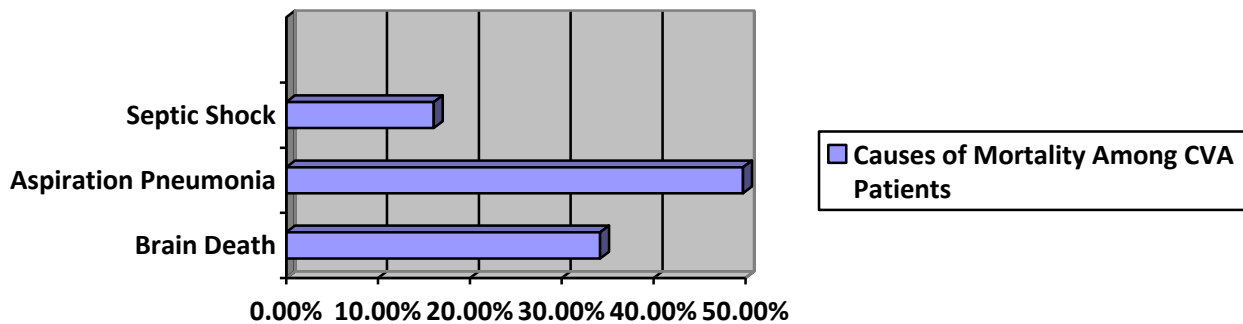


Chart 2. Common Co-Morbidities Associated with CVA

HTN was found to be the commonest co-morbidity associated with CVA, present in 144 patients, followed by DM, found in 67 patients.

44 patients (22.11%) expired during the course of hospital stay. Hemorrhagic CVA (61 out of 82 patients; 74.39%) led to more deaths as compared to ischemic CVA (30 out of 117 patients; 25.61%).



Graph 1. Commonest Causes of Mortality among CVA Patients

Being the commonest neurological cause of morbidity plus mortality the world over and being the third main cause of death, there are various studies similar to ours that aim to ascertain risk factors associated with stroke/CVA in order to monitor disease trends and predict clinical outcomes in patients. [10][11] Conducted in Dr. Ziauddin Medical University Hospital, North Nazimabad Campus, Karachi, the study, very much like ours, identified ischemic stroke (70.1%) as the principal type of stroke as compared to hemorrhagic stroke (29.9%), a mean age of presentation of 62 years, and HTN the leading risk factor (65.8%), followed by smoking, DM, underlying cardiovascular disorders, positive family histories, hypercholesterolemia/atherosclerosis, and previous

histories of CVA/TIA. The in-hospital mortality rate was 11.7%, as opposed to our mortality rate of 22.11%, which could be explained by the below average quality of healthcare delivery services in our settings. The study, like ours, serves to collect data in order to plan medico-social services other than primary plus secondary stroke prevention within the community. [10][12]

A similar Pakistan-based study emphasizes the fact that despite declining in the West, stroke/CVA continues to rise in incidence in Pakistan and other South Asian countries, which share the same healthcare delivery issues as ours. We do not have sufficient data on the prevalence and incidence of the disease when keeping the high population of the

country in mind. [13][14] The study in accordance with ours demonstrates a lesser mean age of incidence with HTN as the commonest risk factor. Also, ischemic strokes predominate; moreover, the lacunar infarct is a commoner finding than cardio-embolic strokes. Similar to ours, the study highlights the need of more epidemiological data via an improved infrastructure, awareness regarding the disease among the general population, and betterments in healthcare facilities to cater to the increasing trend of stroke/CVA. [13][15]

Interestingly, there is another Pakistan-based study that adds a new risk factor to the list which has not been found in our study, though it does not include patients with hemorrhagic CVA in its study. Besides being prevalent in the older age group (mostly between 55 and 65 years), more in females (64%) than males, and HTN being the commonest associated risk factor (68.22% versus 72.4%) – which are almost the same as the values in our study – the study in question differs from ours in that pregnancy and prolonged oral contraceptive use were significant risk factors in this population. [16][17] This can possibly be explained by the fact that this study takes into account both the rural as well as urban populations of the society, and women in urban areas are more into using OCPs rather than those in the rural areas, where OCP use is limited due to lesser availability, affordability issues, lack of awareness, and also ethical considerations which slightly vary in both regions. [16][18]

An Austria-based research also acknowledges that risk factors like HTN and DM are known to increase mid- and long-term mortality related to stroke. Using data from the nationwide Austrian Stroke Unit Registry and multivariate regularized logistic regression analysis to recognize demographic plus clinical variables associated with stroke, they found that early stroke/CVA (within 7 days or less following an attack) was common in the old age group with a mean age of 74 years – as opposed to our mean age of 65.8 years – with more or less the same male to female ratio – 1:1.12 versus 1:1.3 – and a mean duration of hospital stay of 3 days (versus our 3.4 days). [19] Greater functional disability post-

stroke, pre-existing cardiovascular diseases, DM, and stroke involving the posterior circulation or of the non-lacunar type were associated with greater mortality than others. [19][20] The study differs from ours in the sense that it only addresses patients diagnosed as the ischemic variety of stroke/CVA and not the hemorrhagic type. A greater mean age of occurrence could be explained by the better healthcare facilities provided in Austrian healthcare setups. [19]

A wide-based study, involving a wide range of Asian countries, has reviewed the epidemiology of the disease in South, East and South-East Asia, using data from the Global Burden of Disease Study, WHO, and PubMed publications. The results of this study could be effectively used for generalization as the study spans over multiple populations and geographical regions that house almost 60% of the world's population. [21] While Malaysia has the lowest rates of stroke/CVA, Japan and Taiwan have the highest. [22] Pakistan ranks the highest among nations with high prevalence of HTN and DM, and ischemic CVA continues to occur more than the hemorrhagic type, as per our study. [21]

There are a few limitations to our study in question. Firstly, being a center-based study, the results of this study cannot be generalized. Secondly, as the healthcare setup chosen for the purpose of this research is a government facility, which is visited more by the poorer sections of the population and more so by those residing in the rural rather than in the urban areas, the results cannot necessarily be applied to the entire population residing in the area.

CONCLUSION:

Stroke/CVA, whether ischemic or hemorrhagic, brings with it an increased risk of mortality. HTN and DM are the commonest risk factors associated with mortality following stroke/CVA, and brain death, aspiration pneumonia, and sepsis are the leading causes of mortality post-stroke/CVA, which can be explained by poor healthcare services in our settings, lack of awareness among the general public regarding primary and secondary prevention, and low levels of compliance with treatment.

LIST OF ABBREVIATIONS:

CVA	Cerebrovascular Accident
TIA	Transient Ischemic Attack
US	United States
DM	Diabetes Mellitus
HTN	Hypertension
CLD	Chronic Liver Disease
CKD	Chronic Kidney Disease

SD	Standard Deviation
DHQ	District Headquarters
CT	Computed Tomography
MRI	Magnetic Resonance Imaging
MI	Myocardial Infarction
CCF	Congestive Cardiac Failure
BP	Blood Pressure
tPA	Tissue Plasminogen Activator
SPSS	Statistical Package for Social Sciences
OCPs	Oral Contraceptive Pills

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