

# Prevalence and outcome of cerebrovascular disease: A hospital based study

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## Abstract

**Introduction:** According to the Global Burden of Disease (GBD) study and it was seen that cerebrovascular diseases ranked as the second leading cause of death after ischemic heart disease. Many risk factors for stroke have been described. They may refer to inherent biological traits such as age and sex, physiological characteristics that predict future occurrence such as high blood pressure, serum cholesterol, fibrinogen; behaviors such as smoking, diet, alcohol consumption, physical inactivity; social characteristics such as education, social class and ethnicity; and environmental factors that may be physical (temperature, altitude), geographical, or psychosocial. **Aims and Objectives:** To study the prevalence and outcome of cerebrovascular disease observed in a tertiary care institute. **Materials and Method:** The present retrospective record based study was conducted in the department of medicine of Dr Ulhas Patil Medical College and Hospital, Jalgaon. For the purpose of study records from January 2014 from to December 2014 were studied. All the patients admitted in the medicine ward for various conduction were enrolled in the study. Out of them patients with cerebrovascular disease were studied in detail. In the year 2014 total 6791 patients were admitted in the medicine ward and out of them 59 were diagnosed to be suffering from cerebrovascular disease. The detail information of each case was entered in a prestructured proforma, which includes age, sex and presenting complaints. Details about general and systemic examination were also recorded. History of associated risk factors was also recorded. The outcome and total hospital stay was also calculated for each patient and was compared with the age and sex of patients. The collected data was entered in Microsoft excel and was analyzed and presented with appropriate tables and graphs. **Results:** The prevalence of cerebro vascular disease was 8.69/1000 cases in the study population. Majority of the cases of CVA were diagnosed in patients with age more than 50 years of age. Male predominance was observed in the study with 2.11:1 male to female ratio. 32.20% patients recovered completely during the hospital stay whereas 27.12% improved and were discharged and were kept on regular follow-up. 32.20% patients were discharged against medical advice and shifted to other hospitals by their relatives. Hence their follow up was lost. 8.47% patients expired during the course of treatment. Mortality was more in age more than 50 years. Whereas the rate of recovery was more in younger patients. It was seen that all the 5 cases expired in the study were male. **Conclusion:** Thus we conclude that prevalence of cerebro vascular disease was 8.69/1000 cases. Case fatality rate was observed to be 8.47% but the proportion of lost follow up patients was high (32.20%) due to discharge against medical advice. Increasing age and male sex were the observed to be associated with high prevalence of cerebro vascular disease and also affecting the outcome of disease.

**Keywords:** cerebro vascular disease, prevalence, outcome.

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## INTRODUCTION

The first global estimate on the burden of 135 diseases was provided in 1990 by the Global Burden of Disease (GBD) study and it was seen that cerebrovascular diseases ranked as the second leading cause of death after ischemic heart disease<sup>1</sup>. And since 1990 cerebrovascular diseases remain a leading cause of death. In 2001 it was estimated that 5.5 million deaths worldwide occurred due to cerebrovascular diseases (stroke) which was equivalent to 9.6 % of all deaths<sup>2</sup>. Two-thirds of these deaths occurred in people living in developing countries and 40% of the subjects were aged less than 70 years.

Additionally, cerebrovascular disease is the leading cause of disability in adults and each year millions of stroke survivors has to adapt to a life with restrictions in activities of daily living as a consequence of cerebrovascular disease. Many surviving stroke patients will often depend on other people's continuous support to survive.<sup>3</sup> Many risk factors for stroke have been described. They may refer to inherent biological traits such as age and sex, physiological characteristics that predict future occurrence such as high blood pressure, serum cholesterol, fibrinogen; behaviors such as smoking, diet, alcohol consumption, physical inactivity; social characteristics such as education, social class and ethnicity; and environmental factors that may be physical (temperature, altitude), geographical, or psychosocial<sup>4</sup>. In addition, medical factors including previous TIA or stroke, ischemic heart disease, atrial fibrillation, and glucose intolerance, all increase the risk of stroke.

## AIMS AND OBJECTIVES

To study the prevalence and outcome of cerebrovascular disease observed in a tertiary care institute.

## MATERIALS AND METHOD

The present retrospective record based study was conducted in the department of medicine of Dr Ulhas Patil Medical College and Hospital, Jalgaon. For the purpose of study records from January 2014 from to December 2014 were studied. All the patients admitted in the medicine ward for various conductions were enrolled in the study. Out of them patients with cerebrovascular disease were studied in detail. In the year 2014 total 6791 patients were admitted in the medicine ward and out of them 59 were diagnosed to be suffering from cerebrovascular disease. The detail information of each case was entered in a prestructured proforma, which includes age, sex and presenting complaints. Details about general and systemic examination were also recorded. History of associated risk factors was also recorded. Height and weight was recorded and body mass index was calculated as weight in kg/meter. History of associated risk factors was also evaluated. Other risk factor such as diabetes, smoking, old age, obesity and family history of cerebrovascular disease were also looked in the present study. The outcome and total hospital stay was also calculated for each patient and was compared with the age and sex of patients. The collected

data was entered in Microsoft excel and was analyzed and presented with appropriate tables and graphs.

## RESULTS

**Table 1:** Prevalence of cerebrovascular disease

Total patients admitted in medicine department	6791
Coronary artery disease	59
Prevalence	8.69/1000 cases

In the present study it was observed that there were total 6791 admissions in medicine ward in the study institute for various indications. Out of them 59 were diagnosed to be suffering from cerebro vascular disease. Thus the prevalence of cerebro vascular disease was 8.69/1000 cases in the study population.

**Table 2:** Age and sex distribution among the cerebrovascular disease patients

Variable	No. of patients	Percentage
Age	<30	4
	30-39	5
	40-49	9
	50-59	17
	60-69	14
	≥70	10
Sex	Male	40
	Female	19

It was seen that the age wise prevalence was increasing as the age of patient was increasing. Majority of the cases of CVA were diagnosed in patients with age more than 50 years of age. Mean age of patients was  $42 \pm 15.62$  years, ranging from 22 years to 84 years. Male predominance was observed in the study with 2.11:1 male to female ratio.

**Table 3:** Distribution according to outcome and hospital stay

		No. of patients	Percentage
Outcome	Expired	5	8.47%
	Improved	16	27.12%
	Recovered	19	32.20%
	Discharge against medical advice	19	32.20%
Hospital stay	1-5	25	42.37%
	6-10	18	30.51%
	≥11	16	27.12%

Distribution according to outcome

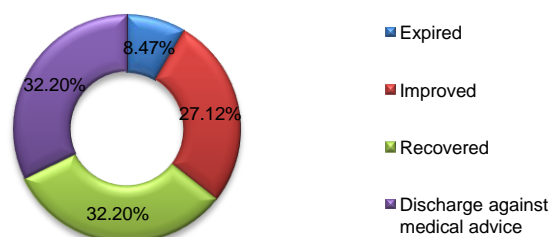


Figure 1: Distribution according to outcome

All the patients were followed up till they were discharged and outcome at the time of discharge was recorded. It was seen that 32.20% patients recovered completely during the hospital stay whereas 27.12% improved and were discharged and were kept on regular

follow-up. 32.20% patients were discharged against medical advice and shifted to other hospitals by their relatives. Hence their follow up was lost. 8.47% patients expired during the course of treatment.

Table 4: Age and sex distribution according to outcome

Variable		Outcome			
		Expired	Improved	Recovered	Discharge against medical advice
Age group	<30	0	0	4	0
	30-39	0	1	6	2
	40-49	1	0	3	1
	50-59	4	4	3	6
	60-69	0	8	2	4
	≥70	0	3	1	6
Sex	Male	5	10	12	13
	Female	0	6	7	6

It was seen that the mortality was more in age more than 50 years. Whereas the rate of recovery was more in younger patients. It was seen that all the 5 cases expired in the study were male.

## DISCUSSION

Cerebrovascular disease or Stroke is a non-communicable disease of increasing socioeconomic importance in ageing populations. According to the World Health Organization, stroke was the second most common cause of worldwide mortality. In South Asian countries demographic changes, urbanization and increased exposure to major stroke risk factors will fuel the stroke burden in the future. It was observed that out of total 6791 admissions in medicine ward 59 cases were diagnosed to be suffering from cerebro vascular disease. Thus the prevalence of cerebro vascular disease was 8.69/1000 cases in the study population i.e. 869 per 100000 cases. Wide variation was observed in the prevalence of cerebro vascular disease among various authors. Bharucha NE *et al*<sup>5</sup> and Dalal PM *et al*<sup>6</sup> observed the prevalence of 842 and 220 per 100000 respectively. Banerjee TK *et al*<sup>7</sup> observed 147 cases per 100000

whereas Das SK *et al*<sup>8</sup> observed 472 cases per 100000 population. One of the main reasons for variation was the instrument and the methodology used has been different in different studies. The Mean age of patients was  $42 \pm 15.62$  years, ranging from 22 years to 84 years. The age wise distribution of cases showed that 15.25% cases were of young stroke. 44.07% cases were in middle age group and 40.68% were in older age group patients. Thus we could state that as the age of patient was increasing the prevalence was also increasing. Mohammad QD *et al*<sup>9</sup> also observed similar findings in their study. Various factors like cerebral emboli from cardiac source, thrombosis of internal carotid artery, hyperlipidaemias and post partum venous thrombosis have been attributed to this peculiar problem of stroke in the young in India *et al*<sup>10</sup>. It was seen that 67.80% patients were male and 32.20% patients were female in the present study. Male predominance was observed in the study with 2.11:1 male to female ratio. Johnson *et al*<sup>11</sup>, Abraham *et al*<sup>12</sup>, Aho *et al*<sup>13</sup>, Bharucha *et al*<sup>5</sup>, Koul *et al*<sup>14</sup> also reported male predominance in their study. All the patients were followed up till they were discharged and outcome at the time of discharge was recorded. It was seen that 33.90%

patients recovered completely during the hospital stay whereas 27.12% improved and were discharged and were kept on regular follow-up. 30.51% patients were discharged against medical advice and shifted to other hospitals by their relatives. Hence their follow up was lost. 8.47% patients expired during the course of treatment. All the patients died during the treatment were more than 50 years of age and were associated with some complication and risk factors such as hypertension, family history and smoking etc. Over-all case fatality rates are likely to differ as a result of different stroke types, admission rules, and the age and sex distribution. It was seen that the mortality was more in age more than 50 years. Whereas the rate of recovery was more in younger patients. It was seen that all the 5 cases expired in the study were male. It has been seen that in developed countries, the average age at which stroke occurs is around 73 years reflecting the older age structure of these countries. The probability of a first stroke or first transitory ischemic attack is around 1.6 per 1,000 and 0.42 per 1,000, respectively<sup>4</sup>. In less developed regions, the average age of stroke will be younger due to the different population age structure resulting from higher mortality rates and competing causes of death. Stroke patients are at highest risk of death in the first weeks after the event, and between 20% to 50% die within the first month depending on type, severity, age, comorbidity and effectiveness of treatment of complications. Patients who survive may be left with no disability or with mild, moderate or severe disability. Considerable spontaneous recovery occurs up to about six months<sup>15</sup>. However, patients with a history of stroke are at risk of a subsequent event of around 10% in the first year and 5% per year thereafter<sup>16</sup>.

## CONCLUSION

Thus we conclude that prevalence of cerebro vascular disease was 8.69/1000 cases. Case fatality rate was observed to be 8.47% but the proportion of lost follow up patients was high (32.20%) due to discharge against medical advice. Increasing age and male sex were the observed to be associated with high prevalence of cerebro vascular disease and also affecting the outcome of disease.

## REFERENCES

1. Murray CJL and Lopez AD. The global burden of disease. 1. 1996. Harvard school of public health.
2. World Health Organization. The World Health Report: 2002: Reducing risks, promoting healthy life. 2002. World Health Organization.
3. WHO MONICA Project Investigators. The World Health Organization MONICA Project (Monitoring trends and determinants in cardiovascular disease). J Clin Epidemiol 41, 105-114. 1988.
4. Bamford J, Sandercock P, Dennis M, Warlow C, Jones L, McPherson K et al. A prospective study of acute cerebrovascular disease in the community: the Oxfordshire Community Stroke Project 1981-86. 1. Methodology, demography and incident cases of first-ever stroke. J Neurol. Neurosurg. Psychiatry 1988; 51:1373-80.
5. Bharucha NE, Bharucha EP, Bharucha AE, Bhise AV, Schoenberg BS. Prevalence of stroke in the Parsi community of Bombay. Stroke 1988;19:60-2
6. Dalal PM. Strokes in the elderly: prevalence, risk factors and the strategies for prevention. Indian J Med Res 1997;106:325-32
7. Banerjee TK, Mukherjee CS, Sarkhel A. Stroke in the urban population of Calcutta – an epidemiological study. Neuroepidemiology 2001;20:201-7
8. Das SK, Banerjee TK, Biswas A, et al. A prospective community-based study of stroke in Kolkata, India. Stroke 2007;38:906-10
9. Mohammad QD, Habib M, Hoque A, et al. Prevalence of stroke above forty years. Mymensingh Med J 2011;20:640-4
10. Jain S, Maheshwari MC. Cerebrovascular Diseases: A Review of the Indian Experience in the last 35 years. Neuroepidemiology 1986; 5: 1-16.
11. Johnson KG, Yamo K, Kao H. Cerebrovascular disease in Hiroshima Japan. Jour Chron Dis 1967; 20: 545.
12. Abraham J et al. An epidemiological study of hemiplegia due to stroke in South India. Stroke 1970; 1: 477-81.
13. Aho K et al. Prevalence of stroke in Finland. Stroke 1986; 17: 681-5.
14. Koul RL et al. Cerebrovascular disease in Rural Kashmir India. Stroke 1989; 21: 255-9.
15. Bonita R, Beaglehole R. Recovery of motor function after stroke. Stroke 1988; 19:1497-500.
16. Burn J, Dennis M, Bamford J, Sandercock P, Wade D, and Warlow C. Long-term risk of recurrent stroke after a first-ever stroke. The Oxfordshire Community Stroke Project. Stroke 25, 333-337. 1994.

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