

Recurrence of ischaemic stroke in first 90 days: A prospective study

Shubhakaran^{1*}, Amita Bhargav², Md Yasin³, Jamashan Stone⁴, Kirti Sachdeva⁵

¹Professor, ²Senior Professor, ⁵Resident, Dept. of Neurology, ^{3,4}Consultant Hemologist, Dr. SN Medical College, Jodhpur, Rajasthan

***Corresponding Author:**

Email: drkhscharak@gmail.com

Abstract

Stroke is the leading cause of death and disability yet preventive aspect specially recurrence of ischemic stroke is given less importance, especially in Indian literature. We conducted a prospective study on 297 patients from September 2013 to April 2015. We observed 22 recurrent events accounting to 7.5%. Important contributory factors were large hemispheric stroke, athero-thrombotic stroke and anti-platelet non-adherence. Patient education regarding anti-platelet adherence and other modifiable risk factors optimal care is must and so is the lifestyle modification.

Introduction

Cerebro-vascular disease (CVD) is the third most common cause of death in developed countries, and disabilities of stroke lead to a serious individual and socioeconomic burden. Although many studies have emphasized strategies for primary prevention of stroke^(1,2,3) the prevention of recurrent stroke has received less attention.⁽⁴⁾ The recurrence risk varies depending on CVD type and risk factors. The prevention of recurrence is by determining etiology and treating patients by antithrombotic and anticoagulant medications, and carotid end-arterectomy and stenting procedures for occlusive vascular lesions.⁽⁵⁾ Although risk factors are very well identified, the extent of control for modifiable risk factors by secondary treatment and the success rate of secondary treatment for the prevention of recurrent stroke have not been sufficiently investigated in our country. In a recent Turkish study on 500 patients the recurrence was in 91 (18%) with ischemic stroke. Among these, 50 (55%) were male and 41 (45%) were female. Mean age of the patients with recurrent ischemic stroke (RIS) was 71.55±10.40 years.⁽⁵⁾ Almost similar recurrence rate has been reported in many western studies.^(6,7,8,9)

Recurrence of ischaemic stroke (IS) occurs mostly in first 90 days. Such recurrence leads to prolonged hospital stay, disability and socioeconomic burden. Prospective data are lacking in this respect in Indian literature. In another study on 297 patients there were important observation that major hemispheric stroke syndrome and atherothrombotic stroke and atrial fibrillation were important predictors of early recurrence, accounting to 22 recurrent stroke in 90 days.⁽⁴⁾ We conducted a prospective observational study in this direction with this background.

Materials and Method

We conducted a prospective observational study from September 2013 to April 2015, in the department of neurology at Dr. S. N. Medical College, Jodhpur (India). A total of 297 patients of ischemic stroke were

enrolled to see the recurrence. Among these 196 were male and remaining 101 were females, with mean age of 62±6.4.

Recurrence of stroke was compared and assessed among various demographic variables i.e. age and sex, vascular risk factors like hypertension, diabetes, discontinuation of anti-platelets, stroke syndromes, subtype vascular territory, smoking or tobacco chewing, consumption of alcohol, Barthel Index (BI) at the time of admission in the hospital.

Definition of recurrence of stroke- Recurrent stroke was defined as a new cerebro-vascular event that met one of the following criteria-

- The event that resulted in neurological deficit that was clearly different from that of index stroke (IS).
- The event that involved a different vascular territory or anatomical site than that of the IS.
- The event that was a different stroke subtype than that of IS.

Results and Discussion

The details of observation or results are being provided in the Table 1. We identified 22 recurrent event in first 90 days after IS, resulting in a recurrence rate of 7.4%. Among demographic characteristics we found no effect of age, sex, education. There was a trend towards higher rate of early recurrence in those who discontinued anti-platelets; 10 recurrence in 82 defaulters (12.2%) Vs 11 in 215 anti-platelet adherent patient (5.11%), which was significant (p<0.001). Among vascular risk factors a higher risk of recurrence among patients with hypertension 7.92% Vs non-hypertensive 6.10%, Diabetic 6.21% Vs non-diabetic 4.94%, smoker 8.64% Vs nonsmoker 5.44%, but those difference failed to reach statistical significance.

	Stroke Recurrences (Total)	90 Days Cumulative Recurrence Rate %
Stroke Syndrome		

Major hemispheric	10(65)	15.38
Minor hemispheric	9(101)	8.94
Lacunar	0(72)	0.00
Brain stem/ Cerebellar	3(59)	5.08
Stroke Subtypes		
Atherothrombotic	19(147)	13.1
Cardioembolic	2(62)	3.22
Cryptogenic	1(81)	1.23
Vascular Territory		
Carotid	18(192)	9.39
Vertebralbasilar	4(104)	3.84
BI Score < 80	16(160)	10
BI Score > 80	6(133)	4.51

Stroke being a common cause of mortality and morbidity, there are well established data about the incidence and risk factors for first stroke. However there are lack of or scarcity of data showing outcomes after stroke. Important reasons are the heterogeneity of stroke, and the lack of effective treatment till 1995-96. We have tried to show the importance of recurrent stroke and its consequences i.e. patients after index stroke are prone to have increased risk of subsequent strokes so as to continue similar aggressive treatment, including statins and antihypertensive drugs, as would be given to patients with other forms of cardiovascular disease. Future clinical trials will better define the optimal management of patients after stroke

Although vascular risk factors like hypertension, diabetes, smoking, alcohol are well known risk factors for recurrent stroke. A major hemispheric stroke syndrome (15.38%) and an atherothrombotic stroke subtype(13.1%) were significant independent risk factors for early recurrence. These findings are similar to earlier study but different from that study in the sense that atrial flutter was not a risk factor⁴. In our country discontinuation of anti-platelets (aspirin or clopidogrel) is also a major culprit. Efforts to sensitize patients for adherence to anti-platelet must be carried out.

An important drawback of our study which may be an important limitation, that size of the study population with RIS was small as was in an earlier study.⁽⁵⁾

Conclusion

1. Early recurrence in our sample with a 90 days cumulative stroke recurrence rate was 7.4%, with major hemispheric stroke syndrome (15.38%) and an atherothrombotic stroke subtype(13.1%) being significant independent risk factors for early recurrence. Discontinuation or default of anti-platelets like aspirin or clopidogrel were also significantly associated with recurrence rate of 12.1% in comparison to those on adherent to

it(5.85%). Hypertension, diabetes mellitus, smoking or tobacco chewing and alcohol consumption are well known risk factors for stroke and its recurrence and hence need to be taken care optimally and carefully. Sensitization to anti-platelets adherence along with risk factors care must be carried out and patient education in this direction may be of immense benefit.

2. Secondary prophylaxis modification of risk factors in stroke are not taken care of optimally. Patients' adherence to the treatment is as important as is the optimal treatment and follow-up strategy for decreasing the incidence of RIS.¹¹
3. Attention should be given to lifestyle modification including management of obesity, smoking cessation, reduction in alcohol consumption, and promotion of physical activity.⁽⁶⁾

References

1. Wolf PA, D'Agostino RB, Belanger AJ, Kannel WB. Probability of stroke: a risk profile from the Framingham Study. *Stroke*. 1991;22:312-318.
2. Gorelick PB. Stroke prevention: an opportunity for efficient utilization of health care resources during the coming decade. *Stroke*. 1994;25:220-224.
3. Wolf PA, Cobb JL, D'Agostino RB. Epidemiology of stroke. In: Barnett HJM, Mohr JP, Stein BM, Yatsu FM, eds. *Stroke: Pathophysiology, Diagnosis, and Management*. 2nd ed. New York, NY: Churchill Livingstone; 1992;3-27.
4. Moroney J T, Bagiella E, Paik M C, Sacco R L, Desmond D W Risk Factors for Early Recurrence After Ischemic Stroke The Role of Stroke Syndrome and Subtype. *Stroke*. 1998;29:2118-2124.
5. Gülşen Kocaman, Hümeyra Duruyen, Abdulkadir Kocer, Talip Asil. Recurrent Ischemic Stroke Characteristics and Assessment of Sufficiency of Secondary Stroke. *Arch Neuropsychiatr* 2015;52:139-44.
6. Kolominsky-Rabas PL, Weber M, Gefeller O, Neundoerfer B, Heuschmann PU. Epidemiology of ischemic stroke subtypes according to TOAST criteria: incidence, recurrence, and long-term survival in ischemic stroke subtype: a population-based study. *Stroke* 2001;32:2735-2740.
7. Petty GW, Brown RD Jr, Whisnant JP, Sicks JD, O'Fallon WM, Wiebers DO. Ischemic stroke subtypes: population-based study of functional outcome, survival, and recurrence. *Stroke* 2000;31:1062-1068.
8. Hankey GJ, Jamrozik K, Broadhurst RJ, Forbes S, Burvill PW, Anderson CS, Stewart-Wynnel EG. Long-term risk of first recurrent stroke in the Perth Community Stroke Study. *Stroke* 1998;29:2491-2500.
9. Mohan KM, Wolfe CD, Rudd AG, Heuschmann PU, Kolominsky-Rabas PL, Grieve AP. Risk and cumulative risk of stroke recurrence: a systematic review and meta-analysis. *Stroke* 2011;42:1489-1494.
10. Dickerson L M, Carek P JAREK, Quattlebaum R G. Prevention of Recurrent Ischemic Stroke. *American family physician* 2007; Volume 76, Number 3: 382-388.
11. Elkind M S. Outcomes after stroke: risk of recurrent ischemic stroke and other events. *Am J Med* 2009 Apr;122(4 Suppl 2):S7-13. doi: 10.1016/j.amjmed.2009.02.005.