

Original Research Article

A study of prevalence of migraine in stroke patients and its association with ischemic versus hemorrhagic stroke: a cross sectional study

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ABSTRACT

Background: Migraine is characterized by recurrent attacks of disabling headache and autonomic nervous system dysfunction. Up to one third of patients also have neurological aura symptoms. It has been suggested that migraine can be a risk factor for stroke. Migraine affects three times the number of women than men. The incidence of stroke in men is two times that of women. It is shown in several studies that women aged 35 to 45 years old are at increased risk of ischemic stroke who had migraine with or without aura.

Methods: The present cross sectional study was conducted in 350 consecutive patients of stroke who were attended OPD and admitted in wards of the Department of Medicine, M.G.M. Medical College and MY Hospital, Indore, MP, India, during period from December 2017 to December 2018.

Results: The highest percentage of respondents i.e. 68% belonged to male group followed by 32% of respondents who were females. The highest percentage of respondents i.e. 66.6% had ischemic stroke while, 33.4% had hemorrhagic stroke. The highest percentage of respondents i.e. 90.9% had no Migraine while, 9.1% had Migraine. The highest percentage of respondents i.e. 31.2% had weekly recurrence, followed by forth nightly (25%) and lowest was 3.1% of daily recurrence. The association of type of stroke with sex group of patient's history of headache which found to be significant ($p < 0.05$). The association of type of stroke with sex group of patient's history of various cerebro-vascular risk factors which found to be significant ($p < 0.05$). Patients having hemorrhagic and ischemic stroke also had HTN in 47% and 12.4% patients respectively.

Conclusions: In this study it is concluded that migraine can be established as a risk factor for ischemic stroke. Early diagnosis and treatment with available medication can be helpful in prevention or decreasing risk for developing stroke.

Keywords: Aura, Cerebro-vascular risk factors, Hypertension, Ischemic stroke, Migraine

INTRODUCTION

Migraine is a common, chronic, multifactorial neurovascular disorder. It is characterized by recurrent attacks of disabling headache and autonomic nervous system dysfunction. Up to one third of patients also have neurological aura symptoms (migraine with aura). It has been suggested that migraine can be a risk factor for

stroke.¹ Migraine affects three times the number of women than men. The incidence of stroke in men is two times that of women. It is shown in several studies that women aged 35 to 45 years old are at increased risk of ischemic stroke who had migraine with or without aura.

Migraine, especially migraine with aura, has been suggested as a risk factor for cardiovascular disease and

stroke.^{2,3} Numerous studies, including meta-analyses have reported an 2-fold increased risk for ischaemic stroke and cardiovascular disease among patients with migraine.⁴⁻⁶ For haemorrhagic stroke the association is less clear. Cerebral ischemia is caused by a reduced blood flow that lasts longer than several seconds. If the cessation of flow lasts for more than a few minutes, deprivation or lack of blood supply to brain results in stroke. There are two main types of stroke, and among them one of which is suggested to have a link with certain types of migraine.

It has been found that there is increased plasma endothelin 1 and endothelin 3 concentrations within 72 hours of new onset stroke patients without a known history of migraine, which suggests a potential link between increased concentrations of endothelin and stroke pathogenesis in the general stroke and migraine patients.⁷

Present study was evaluated migraine as risk factor for both ischemic and hemorrhagic stroke and authors also tried to find out prevalence of migraine in patients with cerebro-vascular disease.

METHODS

The present cross sectional study was conducted in 350 consecutive patients in the Department of Medicine, M.G.M. Medical College and M.Y. Hospital, Indore, MP, India, during the period from December 2017 to December 2018. The study was approved by the ethics committee of M.G.M. Medical College and M.Y. Hospital, Indore, MP, India. Each patient was included after receiving her/his informed consent.

Inclusion criteria

All patients, who were above 18 years, attended M.Y. Hospital, Indore, MP, with newly diagnosed and/or old case of stroke who gave valid consent for participation in this study were included.

Exclusion criteria

- Prisoners and orphans.
- Patients with valvular heart disease.
- Unknown patients.
- Patients not giving written consent for participation.

This cross sectional study was carried out at the M.G.M. Medical College and MY Hospital Indore, MP, India. Patients were selected using non-probability convenient sampling after getting approval from the institutional review board. Patients included aged more than 18 years of either gender who diagnosed as a case of stroke newly diagnosed and old. Informed consent was obtained from all the subjects. Details were collected using a proforma which included details like demographic data and history

including age, gender, hospital registration number, and disease duration were noted.

Patients were asked about symptoms of migraine according to ICHD (International classification of headache). Patients were inquired whether the stroke is ischemic or hemorrhagic by imaging modalities.

Statistical analysis

It was an observational study where results were presented in form of numbers and percentage. Chi square test was applied to determine the association between variables and 'p' value of <0.05 was taken as statistically significant. Frequency distribution was used to represent the number and proportion falls under each category. The final data was presented in forms of tables and graphs. Statistical software "R-tool" was used for data analysis.

RESULTS

The present cross sectional study was conducted in 350 consecutive patients in the Department of Medicine, M.G.M. Medical College and M.Y. Hospital, Indore, MP, India, during the period from December 2017 to December 2018. Our findings are as follows:

As shown in (Table 1), the distribution of respondents based on status of migraine they had. The highest percentage of respondents i.e. 90.9% had no migraine while, 9.1% had migraine.

Table 1: Distribution based on presence of migraine.

Migraine	Frequency	Percent
Absent	318	90.9
Present	32	9.1
Total	350	100

Table 2 shows, the distribution of respondents based on duration of headache or migraine they had. The highest percentage of respondents i.e. 43.8% had migraine for last 2-4 years and lowest percentage is 15.6% for 0-2 years and >6 years.

Table 2: Distribution based on duration of headache.

Durations	Frequency	Percent
0-2 Years	5	15.6
2-4 Years	14	43.8
4-6 Years	8	25
>6 Years	5	15.6
Total	32	100

Table 3 depicts, patients having hemorrhagic stroke showed the highest percentage 69.2% for male group, while showed lower percentage (30.8%) for female group. Similarly, patients having ischemic stroke showed the highest percentage(67.4%) for male group, while

showed lower percentage(32.6%) for female group. The association of type of stroke with sex group of patients which was found to be non-significant (p >0.05).

Table 3: Association of type of stroke with sex group.

Sex	Type of Stroke		Total
	Hemorrhagic	Ischemic	
Female	Count	36	76
	%	30.8%	32.6%
Male	Count	81	157
	%	69.2%	67.4%
Total	Count	117	233
	%	100%	100%

Chi Square Test = 0.122, df = 1 p-value = 0.727 Non-Significant

Table 4 shows, the association of type of stroke with sex group of patient’s history of headache which found to be

significant (p <0.05). Patients having hemorrhagic stroke show 100% for not having any history of headache. On the other hand, patients having ischemic stroke showed the highest percentage (86.3%) for not having any history of headache while, show lower percentage(13.7%) for having the history.

Table 4: Association of type of stroke with history of headache.

Any H/o headache	Type of stroke		Total
	Hemorrhagic	Ischemic	
No	Count	117	201
	%	100%	86.3%
Yes	Count	0	32
	%	0%	13.7%
Total	Count	117	233
	%	100%	100%

Chi Square Test = 17.686, df = 1 p value = 0.000* Significant

Table 5: Association of type of stroke with previous history of various cerebro-vascular risk factors.

Previous history	Stroke		Total
	Hemorrhagic	Ischemic	
DM	Count	0	14
	%	0%	6%
HTN	Count	55	29
	%	47%	12.4%
HTN, Old CVA	Count	3	5
	%	2.6%	2.1%
HTN, DM	Count	6	8
	%	5.1%	3.4%
HTN, Old CVA, DM	Count	1	3
	%	0.9%	1.3%
Old CVA	Count	0	4
	%	0%	1.7%
None	Count	52	170
	%	44.4%	73%
Total	Count	117	233
	%	100%	100%

Chi Square Test = 58.538, df = 6 p value = 0.000 Significant

Table 5 shows, patients having hemorrhagic stroke showed the highest percentage (47%) for having a history of HTN while presence of other risk factors was very less and 44.4% patients do not had any previous history of any diseases.

On the other hand, patients having ischemic stroke show the highest percentage (73%) for not having any history of diseases, while only 12.4% patients had history of HTN and remaining around 14% contribute for various other risk factors. The association of type of stroke with sex group of patient’s history of various diseases which found to be significant (p <0.05).

Table 6: Association of motor deficit with severity.

Motor deficit	Severity			Total
	Mild	Moderate	Severe	
No	Count	4	17	10
	%	100%	100%	90.9%
Yes	Count	0	0	1
	%	0%	0%	9.1%
Total	Count	4	17	11
	%	100%	100%	100%

Chi Square Test = 1.971, df =2 p value = 0.373 Non-Significant

As shown in table 6, patients having mild and moderate level of severity showed 100% for not having motor deficit. Patients having severe level of severity showed the highest percentage 90.9% for not having motor deficit while showed lower percentage 9.1% for having it. The association of motor deficit with severity which found to be non-significant ($p > 0.05$).

DISCUSSION

The present cross sectional study was conducted in 350 consecutive patients of stroke who were attended OPD and admitted in wards of the Department of Medicine, M.G.M. Medical College and M.Y. Hospital, Indore, MP, India. It was found that 9.1% patients had migraine among all patients of stroke. Patients having hemorrhagic stroke showed 100% for not having any history of headache. On the other hand, patients having ischemic stroke showed percentage (13.7%) for having the history. Haijun Li et al, study showed prevalence of migraine was 17.15% in patients with ischemic stroke.⁸ Elbert H. Witvoet et al, study showed prevalence of migraine was 22.2% in TIA/stroke patients.⁹ Yasin Abanoz et al, study showed among stroke patients 30.2% had migraine.¹⁰

The association of type of stroke with patient's history of migraine which found to be significant ($p < 0.05$). Out of all patients, the highest percentage of respondents around 25% falls in age groups 40-50, 50-60 and 60-70 years. i.e. 75% of patients belonged to 40 year to 70 year of age. Patients having migraine showed the highest percentage (34.4%) each for age group 40-50 year and 50-60 year respectively against patient not having migraine in these age groups. In our study out of all stroke patients highest percentage of respondents i.e. 68% belonged to male group followed by 32% of respondents who were females.

Patients having Hemorrhagic stroke show the highest percentage 69.2% for Male group while, show lower percentage 30.8% for Female group. Similarly, patients having ischemic stroke showed the highest percentage (67.4%) for male group while, showed lower percentage (32.6%) for female group. Among migraine patients females were 43.7% and males were 56.3%.

The association of type of stroke with sex group of patients which found to be non-significant ($p > 0.05$). Among total patients, 66.6% had ischemic stroke, while 33.4% patients had hemorrhagic stroke. The highest percentage of respondents i.e. 43.8% had migraine for last 2-4 years and lowest percentage is 15.6% for 0-2 years and > 6 years. Patients having hemorrhagic stroke showed the highest percentage (47%) for having a history of HTN. On the other hand, patients having ischemic stroke showed the highest percentage (73%) for not having any history of diseases while, only 12.4% patients had history of HTN and remaining around (14%) contribute for various other diseases history.

CONCLUSION

In this study it is concluded that migraine can be established as a risk factor for ischemic stroke. Early diagnosis and treatment with available medication can be helpful in prevention or decreasing risk for developing stroke.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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