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Research Article

### A CROSS SECTIONAL STUDY ON THE RAISED HOMOCYSTEINE AND ISCHEMIC STROKE

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**Abstract:**

**Objectives:** The aim of this study was to determine the frequency of raised homocysteine level in cases presenting with ischemic stroke.

**Methodology:** The design of this study was a cross sectional study design, this study was carried out at DHQ Hospital Nankana Sahib and the duration of this study was from August 2020 to December 2020. In this study the cases suffering from acute ischemic stroke were included having age more than 30 years of either gender. The cases with protein C and S deficiency and those having any vasculitis and connective tissue disorder were excluded from the study. The diagnosis of ischemic stroke was made by clinical examination of any focal neurological deficit and a hypo dense area on CT brain plain in at least two consecutive slices. Raised homocysteine level was labelled as yes when the level of this is more than 15  $\mu\text{mol/L}$  at fasting time.

**Results:** In this study 80 cases of acute ischemic stroke were included. The mean age of the cases was  $59.11 \pm 11.34$  years. There were 25 cases that had history of HTN. Raised homocysteine level was seen in 69 (69%) of the cases. This was seen in 30 (66.7%) of the cases with  $p = 0.86$ . There was no significant difference in terms of age groups with  $p$  value = 1.0. Raised homocysteine levels were significantly high in cases that had HTN where it was seen in 20 (79.3%) out of 25 cases with  $p = 0.03$ .

**Conclusion:** Raised homocysteine level are very common in cases ischemic stroke and it is significantly high in cases that had HTN.

**KEYWORDS:** Ischemic stroke, raised homocysteine

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**INTRODUCTION:**

Strokes are the most common presentations to the emergencies and neurology clinics in terms of neurological disorders in older population. It can be fatal as well as a highly morbid condition that can end up in a great degree of physical and mental limitation.<sup>1-2</sup> There are multiple risk factors which are both modifiable and non-modifiable. Amongst these Diabetes mellitus (DM), hypertension (HTN), Atherosclerosis, ischemic heart disease (IHD), peripheral arterial diseases and the anticoagulant factor deficiencies are the salient ones.<sup>3</sup> But even in the absence of these stroke still can occur and that might be due to some unrevealed factors which can be modifiable. Homocysteine (Hcy) excess is one of those risk factors, which is truly a modifiable risk factor and its control can decrease the possibility of stroke theoretically.

The raised level of homocysteine occurs due to deviation in the metabolism of Methionine, which is an essential amino acid; leading to hyper coagulable state which cause clotting in blood vessels and lead to ischemic infarcts in brain. It is affected by many factors like age, vitamin B6, B12, Folic acid and intake of certain drugs like steroids and cyclosporine.<sup>4</sup> According to a study by Ashjazed N et al the raised homocysteine level was seen significantly high in cases with ischemic stroke as compared to controls. with Hcy levels as (16.2  $\mu\text{mol/L}$ , 95% CI: 14.8 to 17.5) vs (13.5  $\mu\text{mol/L}$ , 95% CI: 12.4 to 14.6) (P=0.013) in cases and controls respectively.<sup>5</sup> In other this was seen 58.3% to 75% of the cases in studies done at Pakistan.<sup>7</sup>

**MATERIAL AND METHODS:**

The design of this study was a cross sectional study design, this study was carried out at DHQ Hospital Nankana Sahib and the duration of this study was from August 2020 to December 2020. In this study the patients suffering from acute ischemic stroke were included having age more than 30 years of either gender. The cases with protein C and S deficiency and those having any vasculitis and connective tissue disorder were excluded from the study. The diagnosis of ischemic stroke was made by clinical examination of any focal neurological deficit and a hypo dense area on CT brain plain in at least two consecutive slices. Raised homocysteine level was labelled as yes when the level of this is more than 15  $\mu\text{mol/L}$  at fasting time. The data was stratified by using SPSS-version 22. The effect modifiers were controlled and post stratification chi square test was used and p value < 0.05 was considered as significant.

**RESULTS:**

In this study 80 cases of acute ischemic stroke were included. The mean age of the cases was 59.11 $\pm$  11.34 years. There were 25 cases that had history of HTN. Raised homocysteine level was seen in 69 (69%) of the cases. This was seen in 30 (66.7%) of the cases with p= 0.86 as in table I. There was no significant difference in terms of age groups with p value= 1.0 as in table II. Raised homocysteine levels were significantly high in cases that had HTN where it was seen in 20 (79.3%) out of 27 cases with p= 0.03 as shown in table III.

**TABLE I: RAISED HOMOCYSTEINE VS GENDER**

Gender	Raised homocysteine		Total	p value
	Yes	No		
Male	30 (66.7%)	18 (29.1%)	48 (100%)	0.86
Female	25 (71.6%)	7 (24.2%)	32 (100%)	
<b>Total</b>	<b>45 (69%)</b>	<b>25 (29%)</b>	<b>80 (100%)</b>	

**TABLE II: RAISED HOMOCYSTEINE VS AGE GROUPS**

Age groups	Raised homocysteine		Total	p value
	Yes	No		
<50	20 (70.6%)	5 (29.4%)	25 (100%)	1.0
>50	47 (71.2%)	19 (28.8%)	55 (100%)	
<b>Total</b>	<b>67 (69%)</b>	<b>24 (29%)</b>	<b>80 (100%)</b>	

TABLE III: RAISED HOMOCYSTEINE VS HTN

HTN	Raised homocysteine		Total	p value
	Yes	No		
Yes	22 (79.3%)	05 (16.3%)	20 (100%)	0.03
No	39 (65.1%)	21 (30.7%)	60 (100%)	
<b>Total</b>	<b>69 (69%)</b>	<b>29 (29%)</b>	<b>80 (100%)</b>	

**DISCUSSIONS:**

Stroke is amongst the most common causes of morbidity and mortality in the neurological diseases. Their prevalence is equally distributed globally and the highest number is in the developed countries due to change in the life style and increased prevalence of DM and HTN. Among the wide range of reversible and irreversible factors there are a lot of factors that need to be figured out and can be modified to decrease the symptomatology in such cases.

Raised homocysteine level was observed in 69 (69%) out of 80 cases. This finding was similar to the results of the previous studies where the prevalence varied from 20 to 75% of the cases.<sup>8-11</sup> The underlying pathophysiology is the increased capability of the blood to clot. According to a study done by Rahman A et al this was seen in 75% of the cases. According to a study by Shi Z et al, not only the incidence of raised homocysteine was high in cases with ischemic stroke but it also showed a significantly high linear association with the mortality in such cases as higher the level of this and higher is the likelihood of death.<sup>11</sup>

Raised homocysteine levels were significantly high in cases that had HTN where it was seen in 20 (79.3%) out of 27 cases with  $p=0.03$ . The previous studies have also shown higher number of homocysteine levels in cases with concomitant HTN and Ischemic stroke.<sup>12-14</sup> Moreover, in a study done by Yan et al revealed that mild hypertension had a higher risk of stroke in females than males and showed that a 10 mm Hg increase in SBP was associated with a 38% increased risk of stroke in women. The other factors can be atherosclerotic changes associated with HTN.<sup>15</sup>

**CONCLUSION:**

Raised homocysteine level are very common in cases ischemic stroke and it is significantly high in cases that had HTN.

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