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Ischemic Stroke and Increased Homocysteine Level.

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Abstract:

Objective: The main aim of this study was to find the correlation between ischemic stroke and increased homocysteine levels.

Type of Study: It is a cross sectional type of study.

Place and Duration of study: This study was carried out in a duration of 15 months from February 2018 April 2019 in medical departments of Jinnah Hospital Lahore.

Materials and Methods: A total of 100 patients were included in this study. The patients included in this study were between the ages of 40 to 80 years. Both genders were selected randomly. CT brain plain was obtained in all these patients and diagnosis of ischemic infarction was made of the basis of presence of hypo dense area. Blood samples were taken from all the patients and sent for homocysteine levels and the value of 15 µmol/L was labeled as high.

Results: Out study included 100 patients with 40(40%) females and 60(60%) males. 52.34± 6.57 years was the mean age. 60% cases had increased homocysteine levels and frequency was much higher in female patients which was found to be affecting 24(63.15%) cases. The frequency was much higher in people with increased age ranging between 60 to 80 years where it was found to be 65.38%.

Conclusion: One of the most fatal complications caused by increased homocysteine levels is ischemic stroke and the incidence is much higher in people with increased age ranging between 60 to 80 years.

Keywords: Stroke, Ischemia, raised homocysteine

Introduction: One of the commonest neurological disorder is stroke that can be caused by multiple etiologies and can result in increased morbidity and mortality. Incidence rate is different in different regions of the world but the highest number of stroke cases are seen in Asia, Europe and Russia. Neurological deficits caused by stroke can impair the quality of life in different ways. (1, 2)

The focal neurological deficits seen in stroke varies depending upon the area of the brain involved and it can be single nerve palsy, hemiplegia or paraplegia. Multiple etiologies which can either be modifiable or non-modifiable like hypertension, diabetes, family history of stroke or dyslipidemia can lead to stroke. (3)

Even in the absence of all well researched risk factors, stroke can still occur which shows that further studies are needed involving risk factors which are not studied well. One of such risk factors is homocysteine levels in blood to which very little attention was paid in the past but now it is being widely studies all over the world.

One of the byproducts obtained by the metabolism of Methionine (an amino acid) is homocysteine. The hypercoagulation caused by this product is the mainstay of disorder that leads to the formation of thrombus which can be dislodged as an embolus causing decreased blood supply to the brain and stroke.

A study carried out by Han L et al revealed that increased levels of homocysteine levels in blood can not only increase the chances of stroke but can also increase the severity of the stroke. (4, 5) A study conducted in Pakistan showed increased levels of homocysteine in blood to be 58.3% while in another study it was found to be raised in 75% of the cases.

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Discussion: The debility and dependence of the patient upon others caused by the stroke can put serious burden on the care taking family economically as well as providing health facilities to the patient. The patient's life itself can become miserable. Thus, the main emphasis is in cases of stroke is focused on prevention of the risk factors that causes stroke rather than curing the disease.

According to our study 60% of the cases had increased homocysteine levels. These results are similar to other studies where incidence of 40-75% was seen in patients with ischemic stroke. Increased homocysteine levels are strongly associated with severity of the disease and is correlated with large and small vessels disorders. (8-10)

More females are affected according to our study where the results showed incidence of 63.15% (24) cases. Similar findings are shown in previous study which shows the female gender is another risk factor. A study held in China showed similar results where female patients had higher risk for suffering from stroke (11). Hormonal imbalance due to altering levels of progesterone and estrogen mainly in old age can be the main reason for this increased risk factor.

People with increased age mainly between 60 to 80 years had higher homocysteine levels were it was seen in 34 (65.83%) cases. Previous studies also support our results where increased age had been proved to be a significant risk factor alone in causing ischemic stroke in patients with increased homocysteine levels (12, 13). Narrowing of the arteries due to increased age can be the main cause for this increased risk of stroke. Hormonal changes seen in females after the menopause can be another risk factor. Moreover, electrolytes imbalance, dietary irregularities and vitamin deficiencies can increase homocysteine levels which can cause ischemia and lead to stroke.

Conclusion: One of the most fatal complications caused by increased homocysteine levels is ischemic stroke and the incidence is much higher in people with increased age ranging between 60 to 80 years.

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