STUDY TO KNOW THE PREVALENCE OF DECREASE SERUM ZINC LEVELS AMONG CEREBRAL INFARCTION PATIENTS

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Abstract:
Objective: To evaluate the low serum zinc levels prevalence in cerebral infarction patients.
Study design: A cross-sectional descriptive study.
Place and Duration: This Descriptive cross-sectional study was conducted in the Department of medicine Unit II of Services Hospital Lahore for one year duration from June 2017 to June 2018.
Methods: 180 patients between 49-78 years of age were selected for the analysis to determine the clinical characteristics of stroke, detailed clinical examination, and clinical history and to scan the brain by tomography. All these patients to generate computerized (CT) brain infarction. Within 24 hours after the admission, Serum samples were withdrawn and analysis of serum zinc levels was done. All related data have been received and in a special way it was recorded.
Results: with cerebral infarction, 180 patients were enrolled in the analysis. Of the 180 patients studied, male were 104 (56.92%) and female were 78 (43.08%). The 63.04 ± 8.65 years was the mean age. In 59 (32.8%) patients, 56 (31.1%) of these 180 patients were admitted within the first 12 hours after the cerebral infarction onset. The mean zinc level in the serum was 12,310 ± 3,20 μmol / L and 60 (33.08%) patients had serum zinc levels lower than the normal reference range. 121 (67.2%) patients had zinc levels within normal limits.
Conclusion: The results of this analysis proves that zinc is insufficient in a significant proportion in cerebral infarction patients. The development of preventive strategies and new therapies for defamation of the CNS should take into account the role of zinc in damage, repair and neuronal function.
Key words: *stroke, cerebral infarction, serum zinc level.*

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INTRODUCTION

The 3rd most common cause of death in the world is stroke. More than 16 million people worldwide suffer an acute stroke every year. More than 80% survive acute insults, but unfortunately most of the victims are long-term neurological deficits that makes stroke what makes adults1 the most important cause of chronic disability. Stroke is a wide range of global problems with other diseases associated with atherosclerosis. Approximately 87% of the paralysis worldwide is caused by heart attack and the rest is hemorrhage. Approximately 3.5 million deaths occur in developing countries each year due to stroke. The higher prevalence of stroke is noted in Asians. In Asia population, the stroke frequency ranges from 183 to 340 per 100,000. In Asia, it is estimated that the proportion of lifestyle population and changes in the absolute sense due to stroke load, and the rate of total disease burden, both will increase. There are no significant population-based epidemiological studies on stroke in Pakistan. The estimated annual prevalence is 240 / 100,000. This is 69% of cases of ischemic origin. These figures represent a huge challenge for the health system in Pakistan. Control of cerebral infarction risk factors remains an important goal for intervention. Zinc is necessary for the structure and function of regulatory, structural and enzymatic proteins. As a "trace element" from its previous marginal state, zinc was promoted as a key modulator of neuronal excitability together with calcium, potassium and sodium. "Glutaminergic" synapse is the most abundant type of synapse in the cerebral cortex and zinc plays a privileged role in cortical communication. About 10% of all zinc in the brain is found in the presynaptic vesicles of glutamitergic neurons and is released in the synaptic cleft after stimulation of nerves that mediate a few vital physiological functions. Zinc deficiency in the diet can affect brain homeostasis in the brain and cause brain dysfunction. Preclinical studies have thoroughly evaluated the importance of zinc in cerebral infarction. Clinical study performed by Bhatt et al. U. It showed low zinc levels in 35.7% of patients with cerebral ischemia and concluded that low serum zinc concentrations were linked with a more severe stroke at admission and at discharge poor functional status. It has also been suggested that

prior treatment with zinc-protoporphyrin complexes reduces the size of the infarct and the edema associated with transient cerebral ischemia. Very limited clinical studies worldwide have investigated the relationship between serum zinc levels and severity of cerebral infarction. There has never been such a study in Pakistan. Few resources are scarce for the prevention and treatment of stroke in Pakistan. To better understand the problem and the infinity of accurate information about the role of micronutrients in the pathogenesis of stroke, it can be a hope light for the population at risk. The aim of this study was to determine serum zinc levels in stroke patients secondary to cerebral infarction. The study will work as a pilot project for additional studies on this subject. If serum zinc is low among these patients, then it is to be emphasized that the serum zinc routine level in patients with cerebral infarction and for patients with ischemic stroke is recommended, and then recommended complement zinc treatment, and in the risky disease to be emphasized.

MATERIALS AND METHODS:

This Descriptive cross-sectional study was conducted in the Department of medicine Unit II of Services Hospital Lahore for one year duration from June 2017 to June 2018 in 180 cerebral infarction patients. Probabilistic sampling technique was used. Patients with cerebral infarction between 50 and 80 years of age were included in the study, regardless of gender. Patients who had stroke due to reasons other than cerebral infarction and who already had zinc support were excluded from the study. The hospital ethics committee allowed this study to be reviewed and conducted. Informed consent was obtained from patients or assistants. After the determination of the clinical features of stroke, detailed history and detailed clinical examination, patients between the ages of 50-80 were included in the study. Brain CT scan was applied to all patients of the Department of Radiology to create cerebral infarction. Patients who had a stroke or already had zinc supplementation for reasons other than cerebral infarction were excluded from the study. Blood samples were taken within 24 hours of admission to estimate the zinc level. Blood samples were analyzed by photometric method. All information is stored in a specially designed

proforma. All data were entered and analyzed with SPSS-16. The test costs of all patients were covered by the researcher only. For numerical data, descriptive statistics were used to calculate the mean and standard deviation for the age of the patients and the duration of the stroke. Frequency and percentages were calculated for categorical data, ie, gender of patients and low serum zinc levels. The chi-square test was applied in the result variable to see their effect. $P < 0.05$ should be taken as significant.

RESULTS:

180 patients with cerebral infarction were detected. The mean age of the patients was 62.74 ± 8.55. The maximum number of 68 (37.8%) patients was in the 50-59 age group (Table 1).

Table-1: Age groups (n=180)

Age Groups (years)	Frequency	Percent
50-59	68	37.8
60-69	62	34.4
70-80	50	27.8

Out of 180 patients, male were 103 (57.2%) and female were 77 (42.8%). Distribution by gender was not significant for stroke due to cerebral infarction. The ratio of males to females was 1.34: 1. Among these 180 patients, 56 patients (30.91%) were reached within the first 12 hours after the cerebral infarction onset, 66 (35.91%) were in 12 to 24 hours, and in 60 (33.08%) patients from 5 to 25 hours after the onset of stroke. Overall, 59 patients (32.8%) had low serum zinc levels. The zinc mean levels (mean ± standard deviation) were 12.29 ± 3.18μmol / L.

DISCUSSION:

Stroke is a medical emergency requiring immediate treatment. More than 16 million people worldwide suffer an acute stroke every year. More than 80% survive in an acute insult, but unfortunately most victims are full of long-term neurological deficits, a leading cause of chronic disability in the world. Proper treatment increases the chance of survival and increases the degree of recovery. Better medical treatment of each type of stroke can lead to a dramatic reduction in mortality rates. Likewise, comprehensive preventive measures can significantly improve survival and recovery. Research has documented that nutritional interventions can improve the improvement of neurocognitive functions in patients with ischemic stroke. This supports the need for nutritional therapies to improve mortality and morbidity associated with ischemic stroke. To our knowledge, our study is the first study in Pakistan showing that there is a relationship between low serum zinc levels and cerebral infarction. Our study showed that a significant proportion of people with cerebral infarction were deficient in zinc. Zinc mediates various vital physiological functions in the body. Preclinical studies have comprehensively evaluated the role of zinc in cerebral ischemia. Animal studies have shown that zinc supplementation reduces the size of the infarction11, and zinc chelation is neurotoxic. Given the possible relationship between cerebral ischemia and zinc status, we have designed a study to investigate whether Z, and other dietary zinc deficiency rats might affect the outcome of focal cerebral ischemia. He concluded that zinc deficiency in the diet increased the infarct size after persistent occlusion of the middle cerebral artery (MCA) in rats12. In addition, worsening of cerebral ischemia may be due to the severity of zinc deficiency, duration and timing of dietary restriction. UU clinical trial conducted by Bhatt et al. It was concluded that low serum zinc showed 35.7% of patients with cerebral ischemia, and low serum zinc was associated with alta9 functional status when he accepted a more severe stroke and was poor. In their study, Munshi et al. Suggested that low levels of zinc may be an independent risk factor for stroke and may therefore be a potential target for prevention. The study by Soresen concluded that the vesicular zinc in the ischemic neocortex with positive zinc, possibly disappearing from the neuronal terminals and related

areas, disappeared in the neuronal release ischemic neocortex, and concluded that zinc is believed to have a high extracellular concentration of neuroprotective. Pakistan lacks data on the effects of nutritional factors in the treatment and prevention of cerebral infarction. This study in the Department of Medicine of Nishtar Multan Hospital described the deficiency of zinc in patients with ischemic stroke and found it to be very important. This study also demonstrates that zinc deficiency is very similar to that of advanced Western countries in patients with cerebral infarction. Considering only the data from other studies conducted in the United States on this subject. UU., Our findings in the cerebral infarction population Bhatt et al.

CONCLUSION:

The results of this analysis indicate that zinc is insufficient in a significant proportion of patients with cerebral infarction. The new therapies development and preventive strategies for defamation of the CNS should take into account the role of zinc in repair, neuronal function and damage.

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