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Original Research Paper

General Medicine

CORRELATION BETWEEN SERUM PROLACTIN LEVEL AND ACUTE ISCHEMIC STROKE

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ABSTRACT

BACKGROUND- In this study, we determined serum prolactin level in patients with acute stroke and assessed its relationship with disease severity.

METHOD- This is an observational, case control study on patients diagnosed with acute ischemic stroke in Geetanjali Medical College and Hospital, Udaipur.50 cases and 50 controls were included in the study.Serum prolactin level along with other blood routine tests were done.

RESULTS- The mean age group in cases was 60.04±2.04 years and in control was 48.76±2.399 years. Male preponderance was seen in both cases and control.Mean serum prolactin level in cases was 39.678±5.488 and in control was 9.998±0.942 ng/ml, this difference was statistically significant at p value of <0.05. The correlation between serum uric acid levels and severity of stroke on basis of GCS score was not significant.

CONCLUSION- This study concludes that Serum prolactin level can be used as pathological biomarker in patients of acute ischemic stroke but of severity of disease cannot be predicted by its levels.

KEYWORDS : Prolactin, Stroke

BACKGROUND

Cerebrovascular disease is one of the most frequently occurring and significant neurological disorders among the adult population[1,2]. WHO defines stroke as "the rapidly developing clinical symptoms &/or signs of focal (at times global) disturbance of cerebral function, with symptoms lasting more than 24 hrs or leading to death with no apparent cause other than that of vascular origin"[3]. Majority of patients aged ≥65 years with stroke develop dementia and disability worldwide: about 25% of stroke patients develop dementia [4].Prolactin is a polypeptide hormone (molecular mass 21500 KD) that is synthesized in and secreted from specialized cells of the anterior pituitary gland, the lactotrophs[5]. Normal serum prolactin levels vary between 5 and 25 ng/ml for females while in males the normal prolactin levels range from 2 to 18 ng/mL. [6] Inflammation and hypercoagulability are linked to the pathogenesis of atherosclerosis and its clinical manifestations such as coronary or peripheral artery disease and stroke.[7] Platelet activation and aggregation have been shown to play an important role in the pathophysiology of atherosclerosis and thrombosis in acute and chronic arterial disease.[1,8] Prolactin induces expression of P-selectin in the platelet and augment of adenosine diphosphate-induced platelet aggregation leading to thrombosis in acute coronary syndromes mainly in acute MI, also there was an association between high prolactin level and stroke.[9]

AIM AND OBJECTIVES :

1) To evaluate correlation between Serum Prolactin and Acute Ischemic Stroke.
2) To find out correlation between clinical severity of Acute ischemic Stroke and level of Serum Prolactin.

MATERIALS AND METHOD :

This is an observational, case control study which was conducted on 50 patients diagnosed with acute ischemic stroke admitted in ICU, Neurology and Medicine ward in Geetanjali Medical College and Hospital, Udaipur. 50 controls were also included in the study with unrelated ailments. The study was conducted from June 2018 to December 2018.Data of patients were collected by detailed history, clinical examination, investigations and diagnosis confirmed by MRI or CT Brain. Apart from routine investigations, serum prolactin estimation was done. The severity of stroke was assessed as per Glasgow Coma Scale (GCS).

Selection of cases: Inclusion criteria: Patients with Acute Ischemic Stroke >18 years of age. Exclusion criteria: Patients with the history of coronary artery disease, peripheral arterial disease, venous infarcts ,epilepsy, metabolic and endocrine diseases, chronic renal failure, hepatic failure, malignancies, autoimmune and collagen tissue diseases, Pregnant females and Lactating women, history head trauma, previous intracranial surgical procedures and hemorrhagic stroke, platelet dysfunction and/or abnormal platelet counts, bone marrow diseases and hematological conditions that may lead to suppression of bone marrow, use of various drugs that have effects on bone marrow or prolactin metabolism such as anti-psychotics, hormone treatments, prolactin metabolism disorders like pituitary adenoma and prolactinoma and HIV-AIDS patients.

Selection of controls:Patients with unrelated illess >18 years of age were selected and exclusion criteria included acute ischemic stroke patients and rest same as for cases.

RESULTS :

With equal number of cases and controls, i.e. 50 in each group. Mean age of 100 patients was 59.06±13.32 years.The mean age group in cases was 60.56±13.53 years and in control was 57.56±13.06 years.Mean blood uric acid level in cases was 4.98±1.45 and in control was 4.36±1.45 mg/dl, this difference was statistically significant at p value of <0.05.The correlation between serum uric acid levels and severity of stroke was not statistically significant. The Serum Prolactin level in mild and moderate GCS score is 42.28 and 42.72 ng/ml respectively. However, the Serum Prolactin level of patients with severe GSC score is lower i.e. 33.27 ng/ml as compared to others. For cases Pearson's correlation between serum uric acid level and age was 0.348 which is statistically significant. (P<0.05)

Table 1. Age and Serum Prolactin Level

Age group	Case Mean Serum Prolactin	Control Mean Serum Prolactin
<20	0	6.88
21-30	27.7	8.245
31-40	26.38	13.445
41-50	21.398	10.773

51-60	50.814	10.286
61-70	29.454	7.207
>70	45.419	10.685

Table 2. GCS and Serum Prolactin in cases - The relationship between the GCS Score and outcome is the basis for a common classification of acute traumatic brain injury: Severe - GCS 3 to 8, Moderate - GCS 9 to 12 and Mild - GCS 13 to 15. [12]

	No. of Patients	Percent	Mean Serum Prolactin
Mild	24	48	42.28
Moderate	11	22	42.72
Severe	15	30	33.27

Table 3. DIFFERENCE BETWEEN CASES AND CONTROLS

	cases(n=50)	controls(n=50)	P value
Age	60.04±2.04	48.76±2.399	<0.05
Sex			
Male	30	29	0.8388
Female	20	23	
prolactin level	39.678±5.488	9.998±0.942	<0.05

DISCUSSION :

A stroke can be defined as a sudden onset of a neurological deficit that is due to a focal vascular cause. Stroke is an important cause of mortality and long term morbidity. Serum prolactin has been described as cause of increased in vivo and in vitro platelet aggregation and these processes are thought to contribute to the pathophysiology of stroke.[10] In our study, mean serum prolactin level in cases was 39.678±5.488 and in control was 9.998±0.942 ng/ml, this difference was statistically significant at p value <0.05. In the study of Tam et al., (2016) the mean serum prolactin for the case group with standard deviation was 117.26±83.52 whereas, the mean serum prolactin with standard deviation for the control group was 11.99±5.25 which was higher than the current study[11]. Tripathi et al. (2016) found that the patients of ischemic stroke were having higher serum prolactin level as compared to the controls. Mean prolactin level in ischemic stroke patients was 11.8 ng/ml and control group was 6.6 ng/ml (p value < 0.01)[13]. The correlation between severity of stroke based on GCS score and uric acid levels was not statistically significant in our study (p value >0.05).

CONCLUSION :

Serum prolactin can be used as pathological biomarker in patients of acute ischemic stroke. However the levels do not correlate with severity of the disease.

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