Plasma fibrinogen in essential hypertension patients

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Abstract: Plasma fibrinogen is an important component of the coagulation cascade and also a major determinant of blood viscosity and blood flow. Many factors including reduced blood flow due to elevated viscosity of plasma have been implicated in the pathogenesis of hypertension. The aim of this study is to assess the plasma fibrinogen level in hypertensives and to compare whether there is difference in plasma fibrinogen level between obese and non-obese hypertensives and normal individuals.

Methods: This case control study was conducted in the Department of Internal Medicine, Rajiv Gandhi Government General Hospital, Institute of Biochemistry, Madras Medical College, Chennai. 30 cases of hypertension without obesity, 30 cases of hypertension with obesity, and 30 healthy controls were included in the study. Plasma fibrinogen level was measured by Clauss method.

Results: Hypertensive patients was found to have elevated plasma fibrinogen levels than control subjects (1.83 ± 0.84 gram per liter, P < 0.016), among them Obese hypertensives had higher fibrinogen level (3.04 ± 0.58 gram per liter) than non-obese hypertensives (2.70 ± 0.40 gram per liter, P < 0.001).

Conclusion: Plasma fibrinogen level was higher in hypertensive patients than healthy controls. Thus monitoring of plasma fibrinogen level among hypertensives and using drugs to reduce to normal level may prevent the development of thrombotic complications in hypertensive patients.

Keywords: Essential hypertension, obesity, fibrinogen

INTRODUCTION

Fibrinogen is a soluble plasma glycoprotein synthesized by the liver and converted into fibrin by thrombin during blood coagulation. Fibrinogen contributes more than other proteins to plasma viscosity in healthy subjects. This contribution is greatly increased in disease states, particularly in hypertension. Hypertension is classified as essential hypertension and secondary hypertension. About 90–95% of cases are categorized as "primary hypertension" which means high blood pressure with no obvious underlying medical cause. The remaining 5–10% of cases (secondary hypertension) are caused by other conditions that affect the kidneys, arteries, heart or endocrine system. Many factors including reduced blood flow due to elevated viscosity of plasma have been implicated in the pathogenesis of hypertension. Hypertension is considered as an important risk factor for stroke, myocardial infarction and cardiovascular disease, and affects 18% of the adult population. Hypertension leads to accelerated development of atherosclerosis and increased shear stress, leading to plaque rupture. Hypertension also clusters with other risk factors, such as hypertriglyceridemia, obesity, and insulin resistance. Fibrinogen is also considered to play important roles in atherogenesis. Fibrinogen is an important haemostatic and thrombotic risk factor as well as an inflammatory marker.

Obesity was found to be significantly associated with fibrinogen. A study by James et al also showed fibrinogen to increase with body mass index.

This study was done to measure the level of plasma fibrinogen in hypertensive patients and normal individuals. To compare whether there is difference in plasma fibrinogen level between hypertensives with obesity & hypertensives without obesity and normal subjects.

By this study we conclude that plasma fibrinogen is elevated in hypertensive patients compared to controls. Fibrinogen is one of the precipitating factor for thrombosis and its elevated level increases the risk of stroke and cardiovascular disease in hypertensives with obesity.

AIM OF THE STUDY

1. To estimate the level of plasma fibrinogen in essential hypertensive patients. 2. To compare plasma fibrinogen level between hypertensives with and without obesity and normal subjects.

MATERIALS AND METHODS

Cases between 30 – 60 years of age were selected from patients attending the Internal medicine outpatient department and ward of our hospital. 30 hypertensives without obesity and 30 with obesity were included in Group 1 and Group 2 respectively. 30 age and sex matched healthy volunteers were selected as controls (Group 3). The diagnosis of hypertension is based on JNC 7 Criteria.
and non-obese hypertensives
T-test comparison for plasma fibrinogen level between obese and controls (healthy subjects) with p value <0.016.

There was significant difference in plasma fibrinogen level between cases (hypertensives with and without obesity) and controls (healthy subjects). Further, comparisons in fibrinogen levels were made between obese and non-obese hypertensives. A statistically significant difference was recorded in both the comparison.

**CONCLUSION**

It is observed from this study that plasma fibrinogen levels are significantly elevated in hypertensive patients compared to controls. A further rise in plasma fibrinogen level is noted in hypertensive patients with obesity. Increased fibrinogen level is an indication of prothrombotic state and hence the risk of stroke and cardiovascular diseases. Monitoring of plasma fibrinogen level among hypertensives and using drugs to reduce to normal level may prevent the development of stroke and cardiovascular diseases.

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