Study of Serum Beta-Trace Protein in Chronic Kidney Disease

ABSTRACT

Introduction

Chronic Kidney Disease (CKD) is a clinical syndrome that occurs when there is a gradual decline in renal function over time. Early detection and treatment are needed to prevent progression to kidney failure and complications such as coronary vascular disease. Beta-Trace Protein (BTP), also known as Prostaglandin D Synthase is a low molecular weight protein belongs to lipocalin family. It is produced in the choroid plexus of cerebrospinal fluid and it is completely eliminated by glomerular filtration.

Aims and objectives

1. To estimate the serum level of Beta-Trace Protein in patients with chronic kidney disease and to compare them with healthy individuals

2. To correlate the serum Beta-Trace Protein level with serum creatinine and Creatinine clearance

3. To evaluate the correlation between serum Beta-Trace Protein level and other several known risk factors such as Body mass Index, Blood pressure, Random blood sugar and blood urea
Materials and methods

The study was conducted at Thanjavur Medical College Hospital, Thanjavur. 50 patients of known CKD (25 males and 25 females) were selected as cases from the outpatients and wards of the Department of Nephrology. 50 age and gender matched healthy individuals were selected as controls.

Blood samples were collected and analysed for serum BTP (ELISA), serum creatinine (JAFFE’S method), serum urea (urease- GLDH method) and Random blood sugar (GOD-POD method).

Calculated parameters:

Estimated creatinine clearance = \( \frac{(140 - \text{age}) \times \text{Wt in Kg}}{72 \times \text{serum creatinine}} \)

Multiply by 0.85 for females.

Results

The results revealed that serum Beta-Trace Protein concentrations were found to be significantly increased in patients with Chronic Kidney Disease (mean 52.24 ± 29.6) when compared to the control group (mean 33.86 ± 12.1). When patients in different stages of Chronic Kidney Disease were compared, serum Beta-Trace Protein levels were found to be progressively increased from stage 3 to stage 5. This observation shows that serum Beta-Trace Protein increases as renal function declines and inversely correlated with Creatinine clearance (r = - 0.765).
Serum creatinine and blood urea were progressively increased in cases than controls and shows positive correlation with Beta-Trace Protein ($r = 0.630$ and $r = 0.721$) respectively.

Random blood sugar and blood pressure were significantly increased in cases than controls which shows that CKD is more prevalent in DM and HT.

**Conclusion**

The present study demonstrated that serum Beta-Trace Protein levels are progressively increased in patients with Chronic Kidney Disease. Hence it is used as a novel biomarker in the diagnosis and predictor of progression of Chronic Kidney Disease.

**Keywords:**

Beta-Trace Protein, Chronic Kidney Disease, Prostaglandin D Synthase, Serum Creatinine, Creatinine Clearance