Abstract

Correlation Between Free Triiodothyronine and Malnutrition–Inflammation Status in Haemodialysis Population

Thesis

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Introduction. Free triiodothyronine (FT3) is a marker of comorbidity in end-stage renal disease and in many acute and chronic diseases.

There is lack of data about the link between FT3 levels and malnutrition and inflammation in hemodialysis patients. The objective of the present study was to investigate the link between FT3 and malnutrition and inflammation in hemodialysis patients.

Materials and Methods. A total of 100 patients were included in the study. Serum FT3, free T4, TSH, calcium, phosphorus, CRP, serum albumin, Haemoglobin, iron ,iron binding capacity, ESR and serum cholesterol. Were determined and malnutrition-inflammation status was determined by Malnutrition-Inflammation Score (MIS).

RESULT. Our results showed that the mean MIS score was 8.3±5.1 and there were significant negative correlations between MIS and each of BMI, MUAC, Iron, TIBC, Albumin and Hb ($p<0.05$). significant Positive correlations are also

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detected between MIS and each of CRP, ESR 1 and ESR 2 ($p<0.05$). No correlations were noticed between MIS and any of FT3, FT4 and TSH ($p>0.05$).

CONCLUSION. No correlation were noticed between MIS and any of FT3,FT4 and TSH.

Keywords. Hemodialysis, inflammation, malnutrition, triiodothyronine.

Introduction

INTRODUCTION

Malnutrition is a major issue in patients with end stage renal disease, adversely affecting morbidity, mortality, functional activity and patients' quality of life. Therefore, it is vital to identify, treat and prevent conditions associated with poor clinical outcomes **(Sungjin *et al*., 2012).**

Nutritional assessment requires interpretation of a combination of clinical and biochemical parameters **(Sukhminder and Ishwardeep., 2012).**

To assess nutritional status, a complex technique such as a history of weight loss and anthropometric measurements were used as well as the malnutrition-inflammation score (MIS) and subjective global assessment (SGA)**(Vetchinnikova *et al*., 2012).**

Biochemical markers, which may indicate poor nutrient

intake, include reduced serum urea, albumin, pre-albumin, potassium, and phosphate. In the long term, reduction in serum creatinine may reflect reduced muscle mass, reduction in serum cholesterol, insulin like growth factor 1 (IGF-1) and transferrin **(Sukhminder and Ishwardeep., 2012).**

Proinflammatory cytokines are elevated in hemodialysis patients and have been associated with poor clinical outcomes, including increased risk of cardiovascular disease, hospitalization, and death **(Kubotera *et al.,* 2013).**

Thus, identification of nutrition and growth abnormalities, followed by fast intervention with nutritional supplements might allow correction of deficits **(Erfan *et al*., 2012).**

Free triiodothyronine is used as a euthyroid syndrome marker in various diseases. A decrease in FT3 level is observed in cases such as acute-chronic infections,ketoacidosis, inadequately controlled diabetes mellitus, myocardial infarction, and myocardial ischemia.Most patients with ESRD have reduced plasma levels of FT3, reflecting diminished

conversion of T4 to T3 in the peripheral tissue **(Damet *et al.*,2014).**

Low T3 is the most common laboratory finding and subclinical hypothyroidism is most common thyroid disorder found in patient with CKD **(Basu and Mohapatra.,2012)**

Aim of the Work

AIM OF THE STUDY

The aim of the study to assess the correlation between free triiodothyronin (FT3) with other markers of malnutrition and inflammatory markers in patients with end stage renal disease undergoing hemodialysis.

Review of literature

Chapter (1)

Malnutrition in dialysis patients

Chapter:-1

Malnutrition In dialysis patients

Definition of Malnutrition:

Malnutrition is a major issue in patients with end stage renal disease, adversely affecting morbidity, mortality, functional activity and patients' quality of life. Therefore, it is vital to identify, treat and prevent conditions associated with poor clinical outcomes **(SungjinC et al., 2012).**

Table (1): Definition of malnutrition:

Types of Malnutrition	Criteria Applied
Overall malnutrition	BMI≤P25
Mild	BMI:P11-25
Moderate	BMI:P6-10
Severe	BMI≤P5

Muscle protein malnutrition Mild Moderate Severe	MAMA≤P25 MAMA :P11-25 MAMA :P6-10 MAMA≤P5	
Visceral protein malnutrition Mild Moderate Severe	Albumin (mg/dl) or transferring (mg/dl)	
	2.8-305	150-199
	2.1-2.7	100-149
	< 2.1	**<**149

(Solera *et al*.,2004)

Malnutrition is usually defined as poor nutritional status resulting from poor nutrient intake. However complex factors other than inadequate intake are the main cause of the nutritional and metabolic derangements in uremic patients. In these patients, serum and tissue proteins tend to be low despite dietary protein and energy intake that is based on standard nutritional guidelines **(Pupim *etal*.,2006).**

Protein calorie malnutrition is common in dialysis

patients, with as many as one third of patients manifesting with mild or moderate malnutrition **(Fouque *et al*., 1996).**

Nutritional supplements are suggested in such patients to keep their nutritional status appropriate. Therefore, dietary status assessment is meaningful for those patients at risk with malnutrition. Inadequate dietary nutrients intake is an important cause for malnutrition. As we all know protein energy even vitamins and trace elements intake are inadequate in most hemodialysis patients .And the remarkable reduction of daily nutrients intake has been shown to be an independent determinant of reversible impairment of nutritional status **(Dharmatti *et al*.,2013)**

The assessment of nutritional status is based on clinical, biophysical and biochemical parameters. Clinical assessment of subcutaneous fat, muscle mass and history of weight loss are important parts of routine nutritional assessment. Most studies have used body mass index (BMI), skin fold thickness, mid arm circumference and mid-arm muscle circumference to

assess patient's nutritional status **(Henna *et al*., 2010).**

Types of malnutrition in dialysis patients:

There are two types of malnutrition.Type 1 protein-energy malnutrition is characterized by patients poor food intake. This occurs along with slow decrease of serum albumin and loss of muscle mass, the presence of normal levels of C-reactive protein and response to nutritional interventions. The second type of protein-energy malnutrition is characterized by an increased serum level of C-reactive protein and lower serum albumin level than in type 1, even with an optimal food intake.This type of protein-caloric malnutrition is strongly associated with chronic inflammation and does not respond to nutritional intervention**(Boxall *et al*.,2005).**

The first signs of protein and energy malnutrition begin early in the course of progressive renal failure and the development of renal failure is associated with a spontaneous decrease in dietary protein intake. Significant co-morbidity, such as congestive heart failure (CHF), and elevated levels of pro-inflammatory cytokines are usually not present in this type