

**ROLE OF SERUM FERRITIN IN CRITICALLY ILL PATIENTS****SUMATHI.K. * AND SHANTHI.B***Department of Biochemistry, Sree Balaji Medical College and Hospital,
Chennai, TamilNadu. (Bharath University).***ABSTRACT**

Ferritin being an acute phase reactant serves as a useful inflammatory marker in chronic inflammatory disorders. The aim of the study is to study the meaningful association between chronic inflammation and ferritin. 50 critically ill patients admitted in the intensive care unit of Sree Balaji Medical College & Hospital and 50 healthy controls were included in this study. Particle enhanced turbidimetric immunoassay was the method used to estimate serum ferritin for both cases & controls. 72% of cases had increased ferritin which is significant, whereas only 2% had slight increase in serum ferritin level in control. From this study it is concluded that it is mandatory to estimate the serum ferritin in critically ill patients as the increase of ferritin concentration correlates the worsening clinical status in severely ill patients.

KEYWORDS: Turbidometry, Inflammation, Ferritin.**SUMATHI.K.**Department of Biochemistry, Sree Balaji Medical College and Hospital,
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INTRODUCTION

Inflammation is an immune response related to an infection, irritation or an injury. It may be acute or chronic. Chronic inflammation is the major contributing factor for degenerative disease. Ferritin being an acute phase reactant serves as an important marker in chronic inflammatory disorders¹. Ferritin is an intracellular globular protein present intracellularly. It is found in the liver, spleen, skeletal muscles, and bone marrow. Ferritin is found in the blood in less amount. Ferritin level in the blood reflects how much iron is stored in your body. An acute phase protein, ferritin has an important role in iron storage and recycling. Ferritin stores iron upto 4,500 Fe (III) atoms in a soluble, non-toxic form and releases it in a controlled fashion. Apoferritin, the protein part of ferritin consists of 24 polypeptide chains with a heavy subunit (H) and a light subunit (L). In the liver and spleen, long-term storage of iron is done by L subunit of apoferritin². In addition to iron storage, another important function of ferritin in humans has another important role of recycling in macrophages. Ferritin also had an essential role in host immune response which is increased during infection so as to counteract the infective agents³. Serum ferritin is high in chronic infection, chronic renal or hepatic disease, hemosiderosis, ulcerative colitis, crohn's disease,

hemochromatosis, acute inflammation, porphyrias, still's disease & acute malnourishment⁴. Serum ferritin is decreased in anaemia due to nutritional deficit, external or internal blood loss, Celiac disease, pure vegetarians, hypothyroidism, vitamin C deficiency⁵. The main aim of the study is to correlate the acute phase reactant ferritin with chronic inflammatory disease.

MATERIALS & METHODS

This case control study includes 50 normal healthy controls & 50 critically ill patients in the intensive care unit, department of Sree Balaji Medical College & Hospital. Patients with history of nutritional deficit, external or internal blood loss, Celiac disease, hypothyroidism, vitamin C deficiency, hemosiderosis, hemochromatosis, acute inflammation was excluded from this study. With aseptic precautions, serum samples were collected from critically ill patients & from the healthy individuals by venipuncture after getting consent from them. Particle enhanced turbidimetric immunoassay was the method used to estimate serum ferritin in both the cases as well as the healthy individuals. This study was approved by the institutional ethical committee.

RESULTS

Table 1

Group	Age in years		Total
	31-40	41-50	
Case	12	38	50
Control	14	36	50
Total	26	74	100

Age groups of the subjects involved in this study

Table 2

Group	High ferritin	Normal ferritin	Total	p-value
Case	36	14	50	0.000 Significant
Control	2	48	50	
Total	38	62	100	

72% of critically ill patients had high ferritin level which is significant.

DISCUSSION

This is a case control study done in critically ill patients admitted in the intensive care unit of Sree Balaji Medical college & Hospital, Chennai. This study is an age, sex matched case control study. There is no sexual indifference in this study. There is no specificity in selecting the age group as the collection of sample is random sampling. This study reveals an increase in serum ferritin levels in critically ill patients correlated with disease activity, reflecting the essentiality of serum ferritin in chronic inflammatory diseases. Therefore, this study proves that ferritin serves as an important marker in chronic inflammatory diseases. This was supported by Bobbio-Pallavicini F et al, Kamala Vanarsa et al, Nikhil K. Meena et al in their studies^{6,7,8}. Bobbio-Pallavicini F in his cross sectional study showed decreased blood haemoglobin, serum iron, serum transferrin and transferrin saturation compared to an increase in serum ferritin levels in critically ill patients. Kamala Vanarsa in her study proved serum ferritin increased

in systemic lupus erythematosus which is a chronic inflammatory disease. Nikhil K. Meena in his study, told that ferritin level in the blood was increased in chronic infectious disease i.e. staphylococcus aureus bacteremia. High ferritin level in chronic inflammatory diseases is due to an increase in the release of ferritin by the macrophage system into the circulation. Therefore, this study correlates the serum ferritin level with chronic inflammatory disorders.

CONCLUSION

From this study it is concluded that serum ferritin as an acute-phase protein is a useful predictive marker of the severity of the clinical status of critically ill patients. It is found to be useful in predicting the patient's outcome. So this study insisted that it is mandatory to estimate the serum ferritin in critically ill patients which reflects the worsening clinical status in critically ill patients.

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