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Albumin as prognostic value in hospitalised patients with femur neck fracture

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Abstract

Post-surgical state there might be a low formation of the albumin in liver or high degradation of the albumin. In either of the ways the serum albumin will be lowered. Stress and strain is also known to cause hypoalbuminemia i.e low serum level of albumin. Since albumin is a protein it has to be transcribed from the genes and studies have shown that TNF - alpha suppresses this transcription process.

Keywords: albumin, prognosis, hospitalized, surgery, patients

1. Introduction

The normal serum level that is found in the normal adult is around three to five grams per decilitre. Anything below two grams per decilitre is considered to be low. In cases of a pathological state there might be a low formation of the albumin in liver or high degradation of the albumin. In either of the ways the serum albumin will be lowered. ^[1] Stress and strain is also known to cause hypoalbuminemia i.e low serum level of albumin. ^[2, 3] Since albumin is a protein it has to be transcribed from the genes and studies have shown that TNF - alpha suppresses this transcription process. ^[4, 5, 6] The TNF - alpha is known to increase in any inflammation and thus forms a cascade. In case of hospitalised patients the stress and strain in pre surgical patients and chronically hospitalised patients the serum albumin levels are known to be less than normal. In chronically hospitalised patients the nutritional cause can also be taken into consideration for lower serum albumin levels. Early detection of these low levels of serum albumin levels helps the surgeons and the physicians to intervene and thus cut off the progression of the disease. ^[7-11] A sincere effort has been made in this study to understand the relations of the serum albumin level and its effects on the prognosis of the disease and outcome of the surgery if the patient is undergoing any. This study is intended to help the physician, surgeon and general practitioners to understand and intervene in the event and thus help the patient to recover earlier and in a better way.

Aims and Objectives

1. To correlate the serum albumin levels and the prognosis of the patient.

Methods

The study has been done in the Department of Orthopedics, Kanachur Institute of Medical Sciences Medical College, Mangalore.

The study was done from Jan 2019 to Jan 2020.

The sample size included thirty patients. Thirty patients were identified in the department of surgery.

The serum albumin levels were estimated. In chronically hospitalised patients the patients were divided into three groups

1. Serum levels less than 2 gm / dl
2. Serum levels between 2 g/ dl and 5 gm / dl
3. Serum levels more than 5 gm / dl

The serum albumin levels were again estimated and the prognosis was checked in the form of non-wound healing, worsening of symptoms, intra surgical complications, post-operative sepsis and death.

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In each group the necessary treatment was given in the form of nutrition supplementation and was observed for the prognosis.

The serum albumin levels were again estimated and the prognosis was checked in the form of non - wound healing, pain and death.

Inclusion Criteria

1. Only patients with femur neck fracture were evaluated.

Exclusion Criteria:

1. Patients who were on drugs which were known to cause low serum albumin.
2. Chronic liver disease.

Results

Table 1: Frequency of patients in each of the divided groups

Serum Albumin Level	Number of Patients
Group 1 (<2 gm / Dl)	06
Group 2 (2 - 5 gm / Dl)	09
Group 3 (> 5 gm / Dl)	15

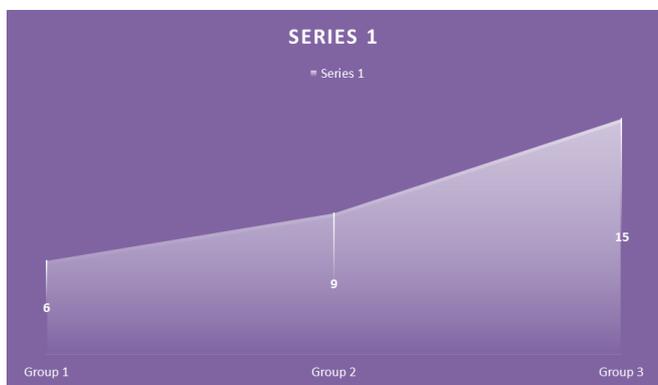


Fig 1: Frequency of Patients.

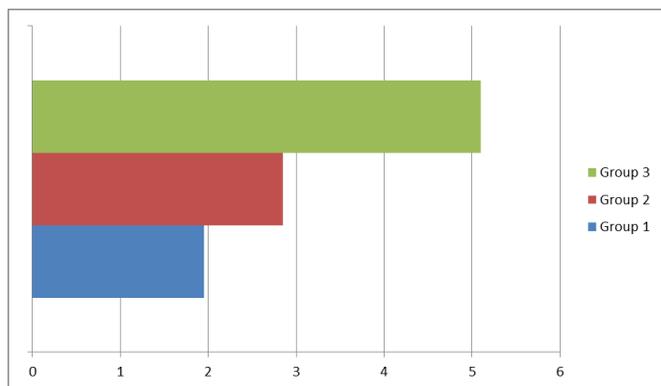


Fig 2: Mean Serum Albumin Levels.

Table 2: Prognosis table correlation to the serum albumin levels.

Serum Albumin Level	Prognosis
Group 1 (<2 gm / Dl)	Non Healing wounds: 06
	Pain: 06
	Intra surgical complications: 01
	Post - operative sepsis: 01
	Death: 01
Group 2 (2 - 5 gm / Dl)	Non Healing wounds: 08
	Pain: 09
	Intra surgical complications: 01
	Post - operative sepsis: 01
	Death: 01
Group 3 (> 5 gm / Dl)	Nil

Table 3: Serum Albumin levels in Post corrected patients after fifteen days of treatment

Serum Albumin Level	Mean Serum Albumin Level
Group 1 (<2 gm / Dl)	4.65 gm / Dl
Group 2 (2 - 5 gm / Dl)	5.50 gm / Dl

Table 4: Prognosis in post corrected patients

Serum Albumin Level	Prognosis
Group 1 (<2 gm / Dl)	Non Healing wounds: Nil
	Pain: Nil
	Death: Nil
Group 2 (2 - 5 gm / Dl)	Non Healing wounds: Nil
	Pain: 01
	Worsening of symptoms: Nil
	Death: Nil

Table 5: Table of Significance.

Serum Albumin Level	Significance
Group 1 (<2 gm/Dl)	Non Healing wounds: Significant (<0.05 2 tailed)
	Pain: Nil (<0.05 2 tailed)
	Death: Nil (Not Significant).
Group 2 (2-5 gm/Dl)	Non Healing wounds: Nil (<0.05 2 tailed)
	Pain: 01 (<0.05 2 tailed)
	Death: Nil (Not Significant).

Discussion

The study is in agreement with that of the other studies conducted by Luiz Ronaldo Alberti, Andy Petroianu¹⁰ and Donald A Redelmeier^[11].

Albumin acts as a transport protein and helps to transport substances which are not affianced towards water i.e hydrophobic agents. It acts as a binding agent and also as a carrier protein. It even helps to carry around important hydrophobic drugs which have high pharmacodynamics values. In fact the whole effects of some drugs depend upon the albumin level. It also helps in transport of fatty acids in lipid metabolism and bile salts and acids and help in their metabolism. Albumin is a charged particle and because of this feature normal excretion is possible in the kidney. There is an equal and opposite charge in the membranes of the kidney which pushes albumin in an opposite direction. If the charge is hampered then the condition called as nephrotic syndrome can be set in. This happens in a lot of children and this is not a progressive disease. It is self - limiting disease. It also is the key ingredient in forming a colloidal osmotic pressure and thus prevents serum to be evacuated in the tissue spaces and thus resulting in oedema. In cases of low levels of albumin this may be seen.

The low levels of albumin have been blamed by many authorities to be the cause of bad outcomes of the disease and surgeries as well. The low albumin may cause oedema and thus prevent antibiotics to act on the diseased part of the boy. The low albumin may also hinder the normal metabolic pathways of many drugs. All these has to be taken into consideration before the treatment schedule has to be planned. Correction of the albumin before surgeries may turn out to be miraculous for the patients especially who are undergoing surgeries. The prognosis is far more better when compared to the patients with low serum albumin levels.

Conclusion

In the present study there is a significant difference in the prognosis of the patients when the serum albumin level increases in the serum.

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