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The Impact Of Vitamin E Supplementation On The Mid Upper Arm Circumference And Calf Circumference Of Critically Ill Patients In Bombay Hospital Indore.

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Abstract

Nutritional support is an integral, though often neglected, component of intensive care/critically ill patients[1]. In this study Vit E along with commercial supplements/ nutraceutical products were intervened in critically ill patients, Vitamin E's main function in the body is to work as an antioxidant, scavenging loose electronsso-called "free radicals"that can damage cells. The hypothesis taken was There shall be no difference in the MUAC and calf circumference of critically ill patients when subjected to Vit E supplementation. A sample of 30 ICU patients was taken and was assessed on the basis of their anthropometry measurements as normal, overweight and underweight. Their eating habits were also seen. T-test was applied and it was seen that the t-test for paired data was 0.31 for MUAC and for calf circumference was 0.2, hence proving ($P<0.01$) the hypothesis was not significant. The present study reports no benefit of antioxidant supplementation Vit E on critically ill patients in attenuating markers of muscle damage or oxidative stress. Therefore, under the current experimental constraints, our findings do not support the use of the specific antioxidant supplements for purposes of decreasing muscle damage or oxidative stress.

INTRODUCTION

Oxidative stress is an underlying cause of critical illness due to oxidant-antioxidant imbalance[2]. Severely injured patients requiring admission to ICU suffer from oxidative stress where hyper-perfusion, reperfusion, endothelial injury and systemic activation of the immune response result in their critical illness. Antioxidants are enzymes such as superoxide, dismutase, catalase and glutathione that catalyze the breakdown of reactive oxygen species.

Regina Brigelius-Flohé[3] conducted a study and stated that in humans, vitamin E deficiency primarily causes neurologic dysfunctions, but the underlying molecular mechanisms are unclear. Because of its antioxidative properties, vitamin E is believed to help prevent

diseases associated with oxidative stress, such as cardiovascular disease, cancer, chronic inflammation, and neurologic disorders.

F. Imounan et al.[4] reviewed that Vitamin E is protective against oxidative damage if the treatment is started much earlier, continued for a longer period, and be consumed with Vitamin C for its effect to become measureable. Vitamin E is very interesting drug for: cerebellar ataxia with Vitamin E deficiency in neuropathy after chemotherapy and reduced the risk of ischemic stroke by 10%.

Joan M. Cook-Mills and Tina Hartert[5] in their study concluded that asthma and allergic lung disease occur as complex environmental and genetic interactions. Clinical studies of asthma indicate a number of protective dietary factors, such as vitamin E, on asthma risk.

Since antioxidants are depleted after major trauma, sepsis or respiratory failure, their replacement and restoration of oxidant-antioxidant balance decreases organ dysfunction. Vitamin E reference plasma concentrations are in the range of 12-46μM, resulting in the recommended dietary intake 15 mg/day i.e., 22.4 IU. The allowance given in critical care is 1500 IU of vitamin E supplemented by alpha- tocopherol/ d-alpha- tocopherol.[6]

AIM AND OBJECTIVE OF THE STUDY

To study the impact of Vitamin E on the anthropometric measurements:- Mid Upper Arm Circumference & Calf circumference in critically ill patients.

The Hypothesis of the Study-

1. There shall be no difference in the MUAC of critically ill patients when subjected to Vit E supplementation.

2. There shall be no difference in the calf circumference of critically ill patients when subjected to Vit E supple mentation.

Methodology-

Total number of samples was 30 irrespective of their age, gender, community etc. tools applied were- General Information about sample and his/her family was taken. History of disease in the family, blood group, occupation, income etc. was taken into account. Critically ill patients in conditions like trauma, sepsis, CVA, COPD, CKD, cancer were taken irrespective of any particular condition. The patients were fed with a high protein diet through continuous drip method. For present study the suitable Anthropometric measurements chosen were MUAC & calf circumference. MUAC and calf circumference are recognized to indicate the status of muscle development.

The critically ill patients were supplemented by vitamin E capsules along with continuous drip method feeding /24 hrs (high calorie, high protein commercial formula feeds).

S.no.	Commercial Supplement Feed Given	Amt. of commercial feed (g); Gms/scoop X No. of scoops	Amt. of water used for dissolution of feed (ltrs.)/24hrs	Energy(Kcal)	Proteins(g)
1.	Kabipro	12.5X 22 =300g	1.5 ltrs	1,092 Kcal	126g
2.	Prosure	9X60	3ltrs	2,181 Kcal	109.18g
3.	GlucernaSR	9X60	3ltrs	2,349Kcal	108.54g
4.	NeproHP	9X60	3 ltrs	2,705Kcal	117.77g
5.	Pentasure2.0	13.5X22	1.5 ltrs	1,372.14Kcal	103.05g

(The selection of commercial feed was made according to the requirement of the patients.)
Two capsules were given to per patient, which was within the recommended allowance. (Recommended alpha- tocopherol acetate=1500 IU
1 capsule of vit E contains 400mg tocopherol acetate i.e., 2 capsules contain 800mg tocopherol acetate. 800mg tocopherol acetate= 1194 IU).

Statistical Analysis- The data collected was analyzed statistically, by using statistical test- T- test.

Results And Discussion

Under this study vitamin E was supplemented to the patients in ICU and the anthropometric measurements- MUAC and calf circumference were taken into account. These measurements were taken on the admission of the patients and at their discharge.
T-test was applied and it was seen that the t-test for paired data was 0.31 for MUAC and for calf circumference was 0.2, hence proving ($P<0.01$) the hypothesis was not significant. There was no significant impact of vit E supplementation on the critically ill patients. There were few patients whose MUAC and calf circumference did not alter and there were also patients whose MUAC and calf circumference changed drastically. There was a fast recovery seen in the patients during the study and the length of stay in ICU was decreased upto 7-12 days.

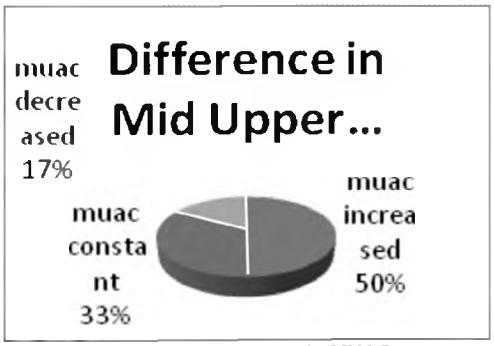


Fig. 5.1- Percentage Difference in MUAC as seen at the time of admission and on discharge

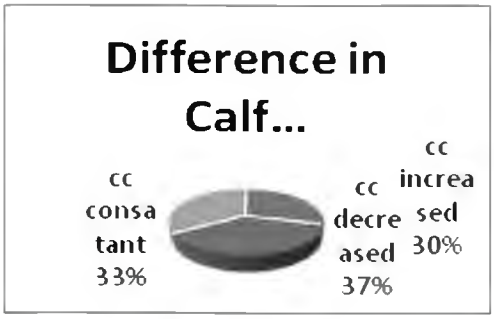


Fig. 5.2- Percentage Difference in Calf Circumference as seen at the time of admission and discharge

SUMMARY AND CONCLUSION-

In critical care supplemented form of vit E can be provided. Under this study vitamin E was supplemented to the patients in ICU and the anthropometric measurements- MUAC and calf circumference were taken into account. In the past studies the effect of vit E was studied on various health issues but no significant change was seen in anthropometric measurements. Prior to the study the length of stay in ICU of critically ill patients was around 1-1.5 months appx. But during the study, with proper nutritional care; providing high calorie, high protein (in form of commercial formula feeds) and antioxidant vit. E, patients were discharged within 7-12 days from ICU and shifted to the wards. The present study does not clearly reports the benefit of antioxidant supplementation viz., vitamin E on critically ill patients in attenuating markers of muscle damage or oxidative stress. Therefore, under the current experimental constraints, our findings do not support the use of the specific antioxidant supplements for purpose of decreasing muscle damage or oxidative stress. This study could have been carried out for a longer time and parameters such as- Length of ICU stay, biochemical parameters, patient's orientation, energy levels, etc. could have been taken into account. For further studies it is recommended that work should be carried to prove the effectiveness of Vitamin E as an anti-oxidant in critically ill patients.

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