

Prospective Study Investigating the Prevalence and Evolution of Malnourishment in the Acute Orthopaedic Trauma Patient

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Purpose: Malnutrition is present in 20%-50% of all patients in acute hospital settings in developed countries. In surgical patients, undernutrition is associated with poor clinical outcomes, including higher infection rates, impaired wound healing, depression of the immune response, longer length of stay, increased muscle loss, increased recovery time, and increased mortality. The primary aim of this study was to investigate the prevalence and progression of malnourishment in orthopaedic trauma patients admitted acutely.

Methods: We prospectively studied orthopaedic trauma patients admitted to the Orthopaedic Trauma Service at a Level I regional trauma center. Serum laboratory markers were obtained on admission, hospital day 3, hospital day 7, and at 6 weeks post surgery. Nutritional markers included albumin, prealbumin, transferrin, C-reactive protein (CRP), and vitamin D. Nutritional status was determined using the Rainey MacDonald nutritional index (RMNI). Patient demographics, ISS, and surgical treatment were also recorded prospectively.

Results: 101 patients were enrolled, but 30 patients were excluded because either they were discharged before and/or appropriate laboratory tests were not drawn on hospital day 3. As a result, 71 orthopaedic trauma patients (36 men and 35 women) with an average age of 51 years were included in the final analysis. 17 patients required more than one surgery for their injuries. On admission, 70%, 40%, and 43% of patients were malnourished based on albumin, prealbumin, and RMNI values, respectively, with 74% in an acute-phase response (APR) as determined by CRP. By day 3, a significant increase in the percent of malnourished patients based on the laboratory markers was noted—97%, 88%, and 91%, respectively, with 100% in APR. On day 7, values stabilized at 96%, 88%, 78%, with 95% in APR. At 6 weeks, malnourishment persisted in 25%, 25%, and 20% of patients, with 31% in APR. Vitamin D levels were low in 80% of patients on admission and 60% continued to have deficiency at 6 weeks.

Conclusion: The prevalence of malnourishment, based on serum values of albumin and prealbumin and the RMNI, in the presence of acute orthopaedic injury, is substantial, and it continues to rise during the initial hospital stay. We found a pronounced decrease in nutritional status during the acute phase, which may indicate the importance of nutritional support immediately following orthopaedic injury. Further studies are required to determine if supplementation will correct malnourishment in the acute setting and whether these parameters result in a greater incidence of complications in our patient population.

- The FDA has not cleared this drug and/or medical device for the use described in this presentation (i.e., the drug or medical device is being discussed for an "off label" use). For full information, refer to page 600.