

Multidisciplinary Malnutrition Screening Program in Orthopaedic Trauma Patients

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Background/Purpose: Postoperative complications in orthopaedic trauma patients are significant contributing factors to the cost of health care and lead to patient morbidity. A potentially modifiable risk factor known to contribute to postoperative complications is malnutrition. Studies have demonstrated that patients with an albumin level less than 3.5 are at a greater risk of surgical site infections in elective spine surgery and arthroplasty. However, there is little information about the results of a screening/treatment program for orthopaedic trauma patients with malnutrition. The purpose of our study was to introduce a malnutrition screening and treatment protocol for orthopaedic trauma patients to identify the incidence of malnutrition and determine the most effective screening techniques.

Methods: An IRB-approved prospective study was performed to enroll patients greater than age 18 years who presented to our institution over 5 consecutive months with acute operative orthopaedic injuries in a malnutrition screening and treatment protocol. Malnutrition screening consisted of serum albumin, transferrin, total lymphocyte count, and vitamin D. Additionally, patients were given a malnutrition screening questionnaire. The screening questionnaire identified high-risk patients and initiated a formal evaluation by a board certified dietitian to confirm the diagnosis and give recommendations on diet supplementation.

Results: 206 patients underwent operative treatment of orthopaedic fractures over the study period. 181 patients (88%) had laboratory testing for albumin, 172 patients (83%) for transferrin, 140 patients (68%) for total lymphocyte count, 177 patients (86%) for vitamin D, and 198 (96%) completed a nursing administered screening questionnaire. 91 patients (51%) had low albumin levels (<3.5 g/dL). 98 patients (57%) had low transferrin levels (<200 mg/dL). 37 patients (26%) had low total lymphocyte counts (<1000/mm³). Polytrauma patients had wide variability in their transferrin levels and/or total lymphocyte count over short periods of time during their hospital stay. 95 patients (54%) had low vitamin D levels (<20 ng/mL). 43 patients (22%) were screened as high risk for malnutrition on the questionnaire and were evaluated by a dietitian. There were three wound-related complications within the screened group. The complications included persistent wound drainage in two patients requiring oral antibiotics with no need for operative irrigation and debridement. One of these patients had decreased levels of albumin, transferrin, and vitamin D. The other patient had no alterations in their screening test. The third patient had early hardware failure with no evidence of infection.

Conclusion: Malnutrition is a common problem in orthopaedic trauma patients. A cost-effective program to identify at-risk patients is needed. In this series, low albumin and vitamin D levels were common, but these studies may overdiagnose malnutrition in trauma patients. Transferrin and total lymphocyte counts vary widely in trauma patients, likely due to the initial trauma and hemorrhage and are likely not informative. A screening questionnaire is easily administered and effective to identify high-risk patients and combined with evaluation by a dietitian may supplant the need for costly laboratory studies.