

Effect of dietary protein and amino acids on immune function

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Abstract

The normal immune system has local and systemic components which are influenced by a variety of alterations. Impaired host immunity is associated with neoplasia, protein calorie malnutrition, and the administration of immunosuppressive drugs. It is well accepted that protein calorie malnutrition impairs host immunity with particular detrimental effects on the T-cell system, resulting in increased opportunistic infection and increased morbidity and mortality in hospitalized patients. Individual nutrient substrates may also have a major influence on the immune system. Individual amino acids are often described as essential, based on requirements for optimal growth and maintenance of positive N balance. Arginine has been demonstrated to be essential to the traumatized host and may have tissue-specific properties which influence components of the immune system. Thus, arginine may be of value in clinical situations where the immune system is compromised. In a series of experiments in normal animals, arginine was demonstrated to enhance cellular immune mechanisms, in particular T-cell function. It also has a marked immunopreserving effect in the face of immunosuppression induced by protein malnutrition and increases in tumor burden. In postoperative surgical patients, arginine supplementation results in enhanced T-lymphocyte response and augmented T-helper cell numbers, with a rapid return to normal of T-cell function postoperatively compared with control patients. These data suggest that arginine supplementation may enhance or preserve immune function in high-risk surgical patients and theoretically improve the host's capacity to resist infection.