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Protein needs for adults with renal disease and pressure ulcers who are on dialysis

It is common knowledge among the medical world that protein requirements increase for wound healing and end-stage renal failure patients who are on dialysis. But how much protein is enough for these types of patients? What if a patient is on dialysis and suffers from a pressure ulcer? This essay looks to address the question of how much protein an adult should be consuming for pressure ulcers while on dialysis.

Dialysis Patient Protein Needs

Nutrient requirements among adults vary due several different factors such as genetics, body type, disease, and more. However, according to Bilsborough and Mann of the International Journal of Sport Nutrition and Exercise Metabolism, adults should ingest 0.8 grams of protein per kilogram of body weight to maintain needs for normal body functions.[1] For a 170 pound individual this would amount to a 62 gram intake of protein each day. However, there is a level at which too much protein may be toxic for the body. Therefore, these authors recommend no more than 2 or 2.5g of protein/kg of body weight per day for an individual (equating to 176g protein for someone who is 80 kg).[1] This seems like quite a bit of protein, but for patients who are trying to heal pressure ulcers or who are on dialysis, this number is not so bad.

Unfortunately, patients participating in dialysis are prone to malnutrition. One review looked at several studies to determine the nutritional status (malnutrition) in dialysis patients. Locatelli et al looked at both animal and human studies to determine their findings. These authors state that one hemodialysis session can cost a person a loss of 4-9 grams of amino acids in the fasting state and 8-12 grams in the post-prandial state. Comparable, peritoneal dialysis patients can lose about 9 grams of protein each day.[2]

This is a clear indicator that protein needs must be replenished for those on dialysis because of the significant loss the dialysis process results in. These same authors mention that the normal protein intake of 0.8 g/kg body weight would be sufficient for maintaining neutral nitrogen balance, but these patients need to be in positive nitrogen balance in order to remain healthy. Thus, the authors' recommendation is to increase this population's protein needs to a minimum of 1.2 g/kg body weight for patients on hemodialysis and 1.3 g/kg body weight for those on peritoneal dialysis in order to maintain neutral protein balance.[2] It was also found that patient protein needs could be as high as 1.5 g/kg body weight each day during periods of post-transplant or mild illnesses.[2]

Protein loss is common in renal failure patients, but is it a result of protein degradation? Lim and Kopple (2000) looked to protein metabolism in patients with chronic renal failure (CRF) to determine protein needs for patients on dialysis. The authors first found that net protein degradation occurs in rats with CRF, so they wanted to know if humans have this issue as well. They found that CRF does not prompt net protein degradation in humans, but energy expenditure is usually high, nitrogen balance is negative, and high levels of protein is lost.[3] Humans with acute renal failure can lose up to an astonishing 30-120 g of protein each day. In order to compensate for the lost protein, these authors suggest that a diet consisting of 1.4 g/kg of body weight each day promotes positive protein balance. Hemodialysis results in 6-12g protein lost per treatment session, and peritoneal dialysis results in an 8-12g protein loss per day. The authors' made a conservative estimate of 0.9-1.0 g/kg body weight/day to replete protein levels, but 1.2-1.3 g/kg body weight may be required in order to maintain positive nitrogen balance.[3]

Protein Needs for Pressure Ulcers

Pressure ulcers arise from chronically still people; those who never get out of bed. The authors of one review article chose to investigate risk factors for pressure ulcers in patients with spinal cord injuries. There were several risk factors, but the most pertinent to this essay revolved around malnutrition. Byrne and Salzberg found evidence to support the claim that low levels of albumin and evidence of anemia,

among other blood values, are causal factors to pressure ulcers.[4] It should be known that albumin is a measure of the level of protein in a person's body. Thus, according to Byrne and Salzberg's findings, hospital patients who have lower levels of albumin are at a high risk of developing pressure ulcers.[4] Since these people have low levels of protein to begin with, they must need excessive protein to compensate for low levels and the pressure ulcers. Dr. Thomas[5] discusses protein needs in patients with pressure ulcers.

Dr. David Thomas, of Saint Louis University, discusses everything from prevention to treatment to complications in his 2001 review article on pressure ulcers. He found several studies that suggested protein as a key factor in healing of pressure ulcers. One such study was a nonrandom assignment to treatment groups of 28 patients with pressure ulcers who were fed either 24% of daily diet from protein or a 14% protein diet. This study found that those patients who consumed 24% of their diet from protein healed their pressure ulcers at a faster rate than those who consumed 14% protein.[5] Another study Dr. Thomas found presented results of a 73% decrease in pressure ulcer surface area in patients when fed a 1.8 g/kg body weight of protein daily.[5] From Dr. Thomas's findings, one can conclude that a high protein diet is beneficial in healing pressure ulcers. However, Dr. Thomas found that protein levels above 1.5 g/kg body weight may be detrimental (i.e. cause dehydration) and so high protein levels should range from 1-1.5 g/kg.[5]

Based on the research found, this author acquired that patients on dialysis and patients who suffer from pressure ulcers need increased levels of protein. This is due to the protein lost during dialysis and for the body to make an effort to heal its wounds. What about patients who suffer from pressure ulcers while on dialysis? Would they then get triple or quadruple the amount of protein? The answer is no. There was an upper limit found for protein intake that would result in dehydration or liver malfunction if someone were to take that much protein each day. This limit was found to be 2.6-5.0 g/kg body weight ingested daily. However, both types of patients require a minimum level of 1.2 grams of protein per kg body weight. So the recommendations for patients suffering both pressure ulcers in accordance with dialysis treatment is to ensure 1.2-1.5 g/kg body weight of protein is ingested throughout each day.

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