Caloric requirements for severe traumatic brain injury

Several Cochrane reviews have established a reasonable basis for early and adequate feeding following traumatic brain injury (TBI), although the number and size of the trials supporting this recommendation are limited [1]. [2].

Nutrition is a significant predictor of death due to TBI. Together with the prevention of arterial hypotension, hypoxia, and intracranial hypertension, it is one of the few therapeutic interventions that can directly affect traumatic brain injury outcome. [3]

Although the calorie and protein intakes had increased from baseline, hospitalized TBI patients were still at a risk to develop malnutrition as the average intakes were considerably low as compared to their requirements. Optimum nutrient intakes especially calorie and protein are crucial to ensure optimum recovery process as well as to minimize risks of infection and complications [4].

With severe injury such as TBI, energy intakes in the range of 25–30 kcal/kg/day are generally recommended [5] [6]. Harris–Benedict equation values are similar at 22–24 kcal/kg, but their calculation includes the additional factors of height, sex, and age.

Rested comatose patients with isolated head injury have a Basal Metabolic Rate that is 140% of normal for that patient (range: 120–250%) [7] [8] [9] [10]

Paralysis with neuromuscular blocker or barbiturate coma reduced this excess expenditure in most patients to ≈ 100–120% of normal, but some remained elevated by 20–30%. [11]. Energy requirements rise during the first 2 weeks after injury, but it is not known for how long this elevation persists. Mortality is reduced in patients who receive a full caloric replacement by day 7 after trauma [12] (a beneficial effect with an earlier goal of replacement by 3 days post-trauma was not found [13]. Since it generally takes 2–3 days to get a nutritional replacement up to speed whether the enteral or parenteral route is utilized, [14] it is recommended that nutritional supplementation begins within 72 hrs of head injury.

The Geriatric Nutritional Risk Index (GNRI)

The Geriatric Nutritional Risk Index (GNRI) is a simple and objective screening tool for clinicians to screen patients' nutritional status based on serum albumin level and their weight and height. The original study had divided patients based on GNRI into quartiles of nutritional risk for death: a no-risk group (GNRI >98), a low-risk group (GNRI 92-98), a moderate-risk group (GNRI 82 to <92), and a major-risk group (GNRI <82). It is a significant independent risk factor and a promising simple assessment tool for mortality in elderly patients with moderate to severe TBI [15].

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