

Disease-related malnutrition
Energy balance, body composition and functional capacity
in patients on oral nutritional support after
major upper gastrointestinal surgery
av
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ABSTRACT

Background: Patients with cancer of the upper gastrointestinal tract are susceptible to malnutrition. Surgery is the only curative treatment although the procedure may negatively impact nutritional status. The aim of this thesis was to investigate energy balance, body composition and functional capacity during the first year but also long time after major upper gastrointestinal (MUGI) surgery in two groups of patient on oral nutritional therapy.

Methods: Oral nutritional therapy was given according to established practice guidelines at our hospital. Study A involved 15 individuals with a total gastrectomy performed at least 5 years ago. Study B involved 41 individuals during the first year after MUGI surgery. Several components of energy balance were measured, such as energy intake (4-day food record), resting energy expenditure (indirect calorimetry), physical activity (activity monitor ActiReg®, and activity interview HPAQmodified) and total energy expenditure (TEE, doubly-labelled water DLW). Body composition and energy stores were measured with dual energy x-ray absorptiometry (DXA) from which total body skeletal muscle mass (TBSMM) could be calculated. Functional capacity was determined as maximal exercise capacity with a treadmill test.

Results: Study A: On group level nutritional therapy did not increase body weight, energy intake or TEE. Half of the patients increased their weight and half remained weight stable or lost weight. Presence of disease and BMI >25 affected weight development negatively. Both ActiReg® and HPAQmodified underestimated TEE at higher levels of activity compared to DLW. Actireg® estimated changes in TEE over time comparable to DLW.

Study B: Weight decreased particularly during the first month after MUGI surgery and was 7% lower after 12 months. Nearly 90% of the body mass loss was fat. One third of the patients remained weight stable and gained in fat free mass. In those who lost weight, 26% of the body energy content was lost 6 months after surgery corresponding to a mean negative energy balance of 340 kcal per day. Muscle mass and exercise capacity were related at all occasions and changes in muscle mass were related to changes in exercise capacity while energy balance did not directly influence the relationship. However, patients in negative energy balance, lost more muscle mass and reduced their exercise capacity compared with patients in energy balance. About one third of patients had low muscle mass before surgery.

Conclusions: The greatest weight loss following MUGI surgery occurred during the first month and persisted throughout the first year after surgery. The weight loss consisted primarily of fat and seemed to be persistent as weight loss in the same order of magnitude was found more than 5 years after surgery. Low muscle mass was common. Weight development varied, and approximately 30 (study B) to 50 % (study A) of patients increased in weight during the intervention. Co-morbidity and BMI >25 seemed to be factors of importance. Muscle mass and changes in muscle mass affected exercise capacity. The importance of energy balance is unclear, but the results suggest that weight change affects muscle development and functional capacity.



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