ABSTRACT

This thesis investigates the influence of nutrition support on a set of critically ill patients after the administration of parenteral nutrition by measuring their energy expenditure and substrate oxidation. The study was performed on 8 spontaneously breathing patients during the 2nd-5th day of polytrauma and the variables were obtained by Indirect calorimetry. The mean age of the patients was 42 ± 16 years. Four patients were obese, three were overweight and one had normal weight in the examined group.

The measurement was conducted on 7 patients after hypocaloric nutrition administration (1323 ± 281 kcal/day) and 1 patient after hypercaloric nutrition administration (3400 kcal/day). Statistical analysis revealed that the administered nutritional support had no significant effect on energy expenditure and the substrate oxidation preference. However, correlations between the values of energy expenditure, nutrients oxidation, and values of some of the laboratory parameters were observed.

The energy expenditure of polytraumatic patients measured at least 4 hours after nutritional administration was 2139 ± 518 kcal/day and 24.6 ± 3.5 kcal/kg/day. This energy expenditure was covered by oxidation of proteins (31%), by lipids (46%) and by carbohydrates (23%). Large variability was found among the results of oxidation of nutrient substrates for carbohydrate oxidation (coefficient of variation, VK = 93%) and lower for lipids (VK = 52%). Oxidation of proteins did not differ significantly among the individual patients (VK = 29%). These results confirm the importance of indirect calorimetry in the determination of the nutritional needs of patients in critical care which are very individual and difficult to predict.

Keywords: critically ill patients, indirect calorimetry, energy expenditure, nutrition support, parenteral nutrition, polytrauma, intensive care unit