

## **SUMMARY**

Objective: The thermic effect (TE) of parenteral nutrition (PV) is not known in severely ill patients. The aim of our study was to measure TE and the dynamics of substrates oxidation during PV in this population.

Type of the study: prospective

Material and methods: After a fastening period of 12 hours (infusion of saline) we administered to ICU patients (N=21) total PV of the following composition: amino acids 1.2 mg, fat 0.5 mg, glucose 4.0 mg per minute per kilogram of ideal body weight. Prior to PV administration and subsequently 2, 5, 12, and 24 hour later energy expenditure (EV) and oxidation of energy substrates were measured by indirect calorimetry. The correlation between assessed parameters and APACHE II score was searched.

Results: TE reached its maximum 5 hours after the onset of PV ( $6.6 \pm 9.5$  % ( $p=0.004$ )) and then it gradually declined. It was not influenced by disease severity. Lipid oxidation was suppressed from the fasting level of  $0.88 \pm 0.60$  to the minimum of  $0.02 \pm 1.0$   $\text{mg.kg}^{-1}.\text{min}^{-1}$  ( $p<0.001$ ), whereas glucose oxidation increased from  $1.19 \pm 1.67$  to the maximum of  $3.46 \pm 2.14$   $\text{mg.kg}^{-1}.\text{min}^{-1}$  ( $p<0.001$ ) in the 12<sup>th</sup> hour. The rate of suppression of lipid oxidation by PV was directly correlated with APACHE II score ( $R=0.56$ ;  $p=0.018$ )

Conclusions: The TE of PV administered to medical ICU patients was a transient phenomenon. Its average magnitude was 6.6 %. The rate of suppression of lipid oxidation as well as the increase in carbohydrates oxidation during PV were directly correlated to the severity of underlying illness.

Key words: energy expenditure, indirect calorimetry, nutritional support, artificial ventilation, ICU