

## **Abstract**

The aim of this study was to determine and evaluate resting energy expenditure (REE) and the utilization of nutritional substrates in 14 polytrauma patients in the ICU. Was also assessed level of impact Overhydration (OH) on the accuracy of the determination.

Diagnostic investigations using indirect calorimetry (IC) was performed in 9 men and 5 women (age  $30 \pm 15$  years, BMI  $27.5 \pm 9.4$  kg·m<sup>-2</sup>) with polytrauma (ISS  $41 \pm 16$ ). For more accurate sizing of REE and extent of utilization of nutritional substrates were used equations derived from the equation of Weir, not Software calorimeter. Using IC volumes were determined only inspired and expired oxygen and carbon dioxide. To determine the rate of OH was used bioimpedance analysis methods using BCM.

Almost 86% (8 men and 4 women) examined patients showed hypermetabolism. Average REE value was  $2241.38 \pm 854.27$  kcal·day<sup>-1</sup>, which represented an average increase of prediction of  $38.09 \pm 49.09\%$  due to the physiological condition. A statistically significant relationship was demonstrated between REE determined using the Weir equation according and the Harris-Benedict equation without ( $P = 0,01$ ) with deduction of OH ( $P = 0,007$ ) only in men.

In clinical practice, significant correlations were established between the REE-IC and BSA ( $P < 0,01$ ), LTM ( $P < 0,05$ ), carbohydrate utilization by ( $P < 0,01$ ) and lipid ( $P < 0,01$ ).

For men, we have demonstrated an increased utilization of proteins and lipids in women only proteins. A statistically significant correlation was established between the utilization by carbohydrates and LTM ( $P < 0,05$ ), and lipid utilization and BSA ( $P < 0,01$ ), weight of the patient ( $P < 0,05$ ), and of course the utilization by proteins and waste nitrogen in urine for 24 hours ( $P < 0,01$ ) and ISS ( $P < 0,05$ ).

Calculation of REE deduction OH Although led to more accurate results, but statistically in our patient population was not significant ( $P = 0,95$ ). The work showed that indirect calorimetry in the ICU has an irreplaceable role to deploy proper nutritional support.

**Keywords:** polytrauma, resting energy expenditure, indirect calorimetry, Harris-Bennedict equation, utilization of nutritional substrates, Overhydration

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