Journal of Zhejiang University-Science B

Cite this as: Danuta ROŚĆ, Przemysław ADAMCZYK, Joanna BOINSKA, Robert SZAFKOWSKI, Irena PONIKOWSKA, Katarzyna STANKOWSKA, Barbara GÓRALCZYK, Barbara RUSZKOWSKA-CIASTEK, 2015. CRP, but not TNF-α or IL-6, decreases after weight loss in patients with morbid obesity exposed to intensive weight reduction and balneological treatment. *Journal of Zhejiang University-Science B (Biomedicine & Biotechnology)*, 16(5):404-411. [doi:10.1631/jzus.B1400219]

CRP, but not TNF-α or IL-6, decreases after weight loss in patients with morbid obesity exposed to intensive weight reduction and balneological treatment



?



Key words: Pro-inflammatory cytokines, HOMA-IR, TNF-α, IL-6, CRP, Morbid obesity

INTRODUCTION



Obesity, as a socio-economic issue, is rising in prevalence worldwide. According to the World Health Organization, in 2005 1.6 billion people were overweight and 400 million patients suffered from obesity (Szymocha et al., 2009).

The first recommendation in the treatment of overweight or obese patients is lifestyle modification. Weight loss via diet and physical activity may be supported by balneological treatment (BT), which is a natural therapeutic method involving bathing, drinking and inhalation of natural mineral water, and also including massage, mud-baths, relaxation and some exercises in water (Gutenbrunner et al., 2010). Weight loss, regardless of the dietary type, positively influences inflammation markers, decreasing CRP and IL-6 levels (Clifton, 2003).

METHODS



The study included 33 patients [(25 females aged 28-69 (mean age of 46) and 8 males aged 20-56 (mean age of 43)] with morbid obesity. The criterion for the patients' eligibility for the study was a BMI of >40 kg/m^2 and a lack of symptoms associated with acute or chronic inflammation. The mean duration of obesity was 22.4 years. The patients were under the care of the Clinic of Balneology and Physical Medicine of the Medical University in Ciechocinek, Poland.

The evaluation of CRP, Il-6, TNF-α, lipid profile, HOMA-IR, and fasting glucose, and the measurement of anthropometric parameters, were carried out before and 21 days after the treatment.

Concentration of CRP, IL-6, TNF-α was measered in plasma and it was performed by Enzyme Linked Immunosorbent Assay (ELISA).



RESULTS AND CONCLUSIONS



In the blood of patients with morbid obesity we found significantly elevated levels of CRP and TNF-α, triglycerides, HOMA-IR and fasting glucose, but a decreased level of HDL-cholesterol, compared with the healthy individuals. The treatment resulted in about a 9.4% reduction in body weight from 122.5 kg to 111.0 kg and a significant decrease in the concentration of CRP, but no change in TNF-α or IL-6. HOMA-IR was significantly reduced.

Conclusions: The decrease in CRP level without changes in TNF-α and IL-6 concentrations after the low-calorie diet and balneological treatment, suggests that an essential amount of adipose tissue must be removed before proper adipocyte function is restored. The decrease in HOMA-IR indicates an improvement in insulin sensitivity, which is beneficial in obese patients.