

Effects of intermitting fasting with exercise training and alkaline mineral supplementation on weight loss

Meyer, T.P., Hottenrott, L., Vormann, J., Werner, T. & Hottenrott, K.

Introduction: Intermittent fasting (IF) seems to be a potential strategy for weight loss with good feasibility (Johnstone, 2015). In particular IF combined with exercise suggests to have synergistic effects on weight loss (Bhutani et al., 2013). However, possible effects of an additional supplementation with alkaline minerals on weight loss have not been shown yet. Therefore, the aim of this study was to determine influences on weight loss in exercising overweight subjects with or without IF. Additionally, the influence of alkaline mineral supplementation was tested.

Methods: 80 overweight subjects, aged $45,4 \pm 7.8$ years were randomly assigned into two groups following different diet strategies. The intermittent fasting group (IFG) followed an IF program (5:2 method) while the non-intermittent fasting group (nIFG) followed a balanced diet for a period of 12 weeks. In a double-blind placebo-controlled design subjects in both groups took either an alkaline mineral supplement („verum“) (Basica@direkt, Protina Pharm GmbH) or a placebo twice daily. All subjects performed a personalized endurance training (3-4 times a week). Body weight and body composition were measured with Tanita® BC-545N Segment Body analyzer. Capillary blood samples were analyzed by a blood gas analyzer (profile®, phax®Plus M Analyzer, nova®biomedical, UK) and urine-pH in morning urine with pH-sticks (Macherey-Nagel, Germany).

Results: Two-way ANOVA showed significant differences in mean weight loss between IFG (-7.8 ± 3.9 kg) and nIFG (-4.8 ± 3.4 kg). There was also a significant main effect of alkaline supplementation (verum -7.4 ± 4.1 and placebo -5.2 ± 3.5) on weight loss ($p < 0.01$). No significant difference was found between dietetic strategy and supplement intake. IFG-verum participants lost 9.45 ± 3.68 kg while IFG-placebo lost 6.51 ± 3.49 kg during the 12 weeks of intervention (independent t-test, $p = 0.139$). Alkaline supplementation significantly increased (HCO_3^-) and urinary pH in IFG and nIFG with verum intake as well.

Discussion: Intermittent fasting and exercise result in a significantly greater weight loss than exercise alone. Alkaline supplementation additionally increased weight loss indicating an influence of acid-base balance on body weight especially in IF. Johnstone A., (2015). *IJO*, 39(5), 727-733, Bhutani S., Klempel, MC., Kroeger, CM., Trepanowski, JF., & Varady, KA (2013). *Obesity*, 21(7), 1370-1379.