Effects of a yeast-cells-based dietary supplement on immune reaction and oxidative stress in clinically healthy subjects

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Introduction

Dietary strategies to sustain physical performance and the immunologic ability to work under stress are often inadequately evaluated. On the one hand, the balance of micronutrients in a diet to improve health control is generally on debate. On the other hand reliable outcome measures assessing the benefit of dietary supplements are not routinely used in clinical chemistry. We have performed an observational study given a yeast-cells-based supplement for a period of four weeks and using some novel first-step markers of clinical investigation. It was the aim of the study to add some new results to the current discussion about the efficacy of dietary supplements.

Methods

11 clinically healthy and normal-weight subjects (20 to 50 yrs) were examined before and after a four week period of intervention. Target variables were analyzed at pre-check-up (U-0) and after a control phase of one week before (U-1) and after (U-2) a 4-weeks intervention period with a daily given dosage of 30 ml of "Dr. Wolz Zell Immunkomplex®", an immunoactive preparation containing bioactive substances, enzymes, vitamins, amino acids, minerals, trace elements and a high content of beta-glucan (900 mg/dosage). All examinations started at 8.00 a.m. and lasted 240 minutes; before starting the test sessions at U-1 and U-2, the participants had to drink their daily dosage of the tested supplement. In order to estimate the individual status of free radical stress, capillary blood samples were taken at start time (0 min) and every 60 minutes (60, 120, 180, 240 min) for immediate measurement of free radical concentration by direct electron-spin-spectroscopy (EPR-System, Fa. Bruker, Rheinstetten, Germany). In order to estimate the status of cellular immunity, heparin-Na-whole-blood samples were taken at start time (0 min) and after 240 minutes for immediate measurement of the induced TNF-alpha secretion after standardized ex-vivo LPS-stimulation (test kit, Fa. Milenia, Gießen, Germany). - Written consent was given by all subjects; and the study protocol was positively approved by the ethical committee of the University of Freiburg.

Results

All participants completed the 5-weeks study without any note of compound-attributable side effects. After intervention (U-2) the concentration of free radicals (fig.1) was significantly ($p<0.01$) lowered at all measuring times (0, 60, 120, 180, 240 min) compared with U-0, and additionally decreased acutely after drinking the daily dosage: The lowest concentration of free radicals (U-2: 1.72±0.19 U/ml vs. U-0: 2.04±0.37) was achieved after 240 min. Significant changes could be found in the stimulated TNF-alpha secretion (fig.2) also. In contrast to stable TNF-alpha concentrations after LPS-stimulation for all (U-0, U-1, U-2) starting measuring times (8:00 a.m., 0 min), an increased LPS sensitivity was measured after drinking the immune complex at the U-2 examination. After intervention the response to the acute intake and contact to the test preparations led to an increased stimulation of TNF-alpha of about 25% (1148±652 vs. 1505±537 pg/ml; $p<0.01$).

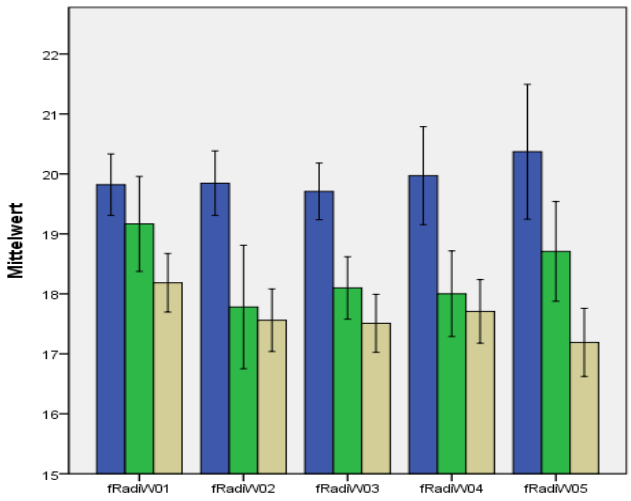

Fig.1: Mean values (U/ml; x±SEM) of concentrations of the free radicals in the 5 samples collected (1,2,3,4,5 indicate 0,60,120,180,240min) at the 3 points of investigation (Treatmeant point 1:blue, 2:green, 3:brown as U-0,U-1,U-2).

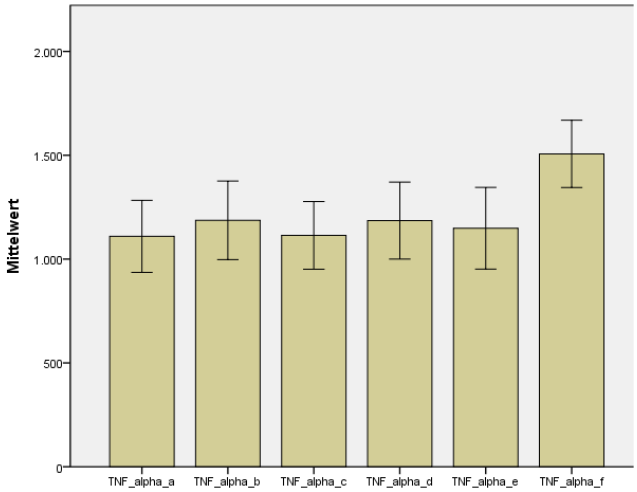

Fig.2: Mean values (pg/ml; x±SEM) of TNF-alpha concentrations at the 3 points of investigation (a,b indicate U-0 before and after 240 min, c,d indicate U-1 before and after 240 min, e,f indicate U-2 before and after 240 min).

Conclusions

Our data show that the methods used are able to objectify even systemic adaptations after intake of micronutrients by an immunoactive supplement. It can be assumed that the regular intake of the tested immune complex, based on a yeast-cells preparation with a high content of beta-glucan, induce a significant adjustment in immunological as well as antioxidant regulations. This modulation may be of specific benefit in preventive health care as well in complementary therapy of health-impaired persons. Nevertheless, the clinical benefit of the preparation tested has to be finally confirmed for selected patients in a randomized controlled trial (RCT).

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A. Berg has written the guidebook "Fit-Faktor Enzym-Hefezellen" outlining the effects and benefits of yeast-cells-based supplements.