

Exercise-Diet Combinations for Enduring Health Advantage

Trevor Archer^{1,2*}

¹Department of Psychology, University of Gothenburg, Gothenburg, Sweden

²Network for Empowerment and Well-Being, Sweden

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Editorial

The physical exercise-dietary selection/restriction has accumulated impressive advantages for the promotion of health benefit over domains covering both prevention and intervention. These domains extend over psychological well-being and somatic resilience to illnesses extending from diabetes and obesity to neuroimmune functioning to chronic cardiovascular disorders.

Selective diets combined with regular physical exercise have been shown repeatedly to maintain and/or improve health and well-being with several functional and somatic domains [1-6]. Nevertheless, both exercise parameters and dietary selection/restriction ought to be quite stringently tailored to the specific individual requirements relevant to type, duration and frequency of exercise, choice of physical condition and fitness, the particular necessities for selected conditions of health/ill-health, and for the purposes of prevention and intervention [4]. For example, deteriorations in maternal and neonatal offspring health and well-being parameters have been linked to the excessive weight gain of some mothers during their term of pregnancy; the combination of dietary selection-restriction and tailor-made physical exercise schedules may reduce weight gain by a significant percentage and increase physiological resilience thereby providing an important prevention-intervention basis for maintained health [7]. In type II diabetes, at risk and diagnosed individuals spend excessive amounts of time indulging in sedentary behaviours, such as “too-much-sitting”, and need to “start-moving”, as illustrated through epidemiologic, cross-sectional and weight management studies [8-10]. Moderate-to-vigorous exercise, whether predominantly endurance or resistance, but essentially of a character that reduces “sitting-behaviour” has been shown invariably to provide benefits for prevention across the spectrum of diabetes risk and for intervention among ‘borderline-cases’ and those individuals with the type II diagnosis [11]. Myokines, a large group of cytokines, produced by muscular contractions, are released in response to various types of exercises with physical inactivity resulting in an alteration of the myokine response, in turn leading to a potential mechanism for the association between sedentary behavior and a plethora of chronic diseases, including diabetes, metabolic syndrome and cancer [12]. Myokine-efficacy, obesity, diabetes and a sedentary lifestyle exert a reciprocal determinant influence upon each other that is invariably detrimental to the individual [13]. Exercise-stimulated myokine secretion into the circulatory pathways appears linked to browning in white adipose tissue that provides a positive metabolic outcome on whole-body fat mass. Rocha-Rodrigues et al. [14] have shown that the induction of myokine production by physical exercise in rats administered a “high-fat” diet contributed to the “brown-like” phenotype of white adipose tissue. In conditions related to chronic cardiovascular complications linked to excess body weight, the diet-exercise advantages formula may be reinforced by agents, such as sibutramine, a centrally-acting serotonin-noradrenaline reuptake inhibitor, an oral anorexiatic, that may induce weight loss and may be linked to an increased risk of myocardial infarction and stroke in high risk patients.

A sedentary, inactive lifestyle combined with unrestricted dietary habits with consequent obesity/overweightness presents an unnecessary, reversible formula for health-well-being disaster with diabetes and neuroimmune dysfunction not least among the outcome scenarios [15,16]. A higher level of cardiorespiratory fitness, essentially an active lifestyle, during young adulthood, without the necessity of a modified Mediterranean-type diet pattern, was associated with a lower probability of pre-diabetes and of diabetes during the middle age years [17]. In obese patients with diabetes, diet and exercise combined with sibutramine induced a weight loss that had attenuated the in blood glucose levels and glycated hemoglobin in comparison with similar weight loss among patients assigned to placebo with diet and exercise [18]. Glycated hemoglobin acts as a biomarker for average blood glucose levels over the previous three months before the measurement as this is the lifespan of red blood cells; greater levels of glycated hemoglobin, implying poorer control of blood glucose levels, have been associated with cardiovascular disorders. In a study of thirteen sedentary, obese female patients, the rapid responses of inflammation markers and insulin resistance to dietary restriction and exercise (five-day time frame of two exercise sessions, 40 min or 80 min, and food reduction) were assessed [19]. The diet-exercise combination reduced the insulin-resistance index and the c-reactive protein fasting concentrations with the prolonged 80 min exercise schedule elevating IL-6 and lowering TNF- α concentrations whereas on those days where exercise was absent left the cytokines unaffected, thereby conferring upon these sedentary patients marked health benefits without the induction of negative effects upon inflammation and muscle soreness. The markedly advantageous influences of a physically-oriented lifestyle upon weight control/awareness and fitness appear to positively impinge upon the cognitive-emotional dimensions of psychological and psychosomatic health and well-being by ensuring the maintenance and the development of resilience [3], even during advanced ages, of a satisfactory body image [20].

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*Corresponding author: Trevor Archer, Department of Psychology, University of Gothenburg, Box 500, 405 30 Gothenburg, Sweden, Tel: 0704-668623; E-mail: trevor.archer@psy.gu.se

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