Prescription and modeling of programmed physical activity in an integrated CVD and other NCD risk management

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Introduction
Physical inactivity, unhealthy diets and smoking are expressed as hypertension, obesity, high serum lipids and hyperglycaemia. Interact with each other are associated with continuous elevation on CVD risk. The aim of this randomized controlled trials was to promote preventive-therapeutic programme for patients with obesity, intra-abdominal fat mass, increased risk for CVD, NIDDM, other obesity related chronic diseases and metabolic disturbance. Main objectives were: to develop the method for prescription of programmed physical activity (PA) in accordance with individual performing the exercise using stress test “vita maxima” by Bruce, to examine the efficacy of the method on CVD risk reduction in abdominal obese patients and to construct the index for predicting the effects of programmed PA and/or dietotherapy in abdominal obese population at above/high risk for CVD.

Methods
The basic criterion for patients selection in 4 groups of physical activity level (PALs) was inicijal level of VO2max (METs). The method for modelling of programmed PA was established using by cassification for aerobic fitness (WHO,1974). Training puls was calculated using equation by Karvonen M. Initial level of aerobic fitness was expressed in term of VO2max (METs). METs was calculated by the equation: VO2max(mlkg-1min-1)/3,5. Intensity of PA was expresed in term of VO2max (METs) (WHO,1985/Andersen KL,1978). Using tables of gross energy expenditure of various PA were chosen different types of PA. The frequency of exercise was 30 min/6 times per wk or 60 min/3 times per wk. The proposed CVD risk management includes both, physical activity and hypocaloric, hiperprotein diets of 1200kcal/d and 1400kcal/d (second phase) with low atherogenic index .

Table 1: Method for prescription of physical activity

<table>
<thead>
<tr>
<th>PAL-s groups</th>
<th>Relative intensity%</th>
<th>Inicijal level of VO2max (METs)</th>
<th>Classification of intensity of physical activity (METs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special program</td>
<td>&lt;30%; 30-49%</td>
<td>&lt;5.6 m.; &lt;4.3 f.</td>
<td>&lt;3.0 m.; &lt;2.1 f.</td>
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<tr>
<td>PAL I - Activity for health</td>
<td>50-59%</td>
<td>5.6-8.5 m.; 4.3-6.8 f</td>
<td>3.0-4.5 m.; 2.1-4.2 f</td>
</tr>
<tr>
<td>PAL II - Exercise for fitness</td>
<td>60-74%</td>
<td>8.5-12.0 m.; 6.8-10 f</td>
<td>4.5 - 7.0 m.; 4.2 - 6.3 f</td>
</tr>
<tr>
<td>Sport</td>
<td>75-84%; ≥85%</td>
<td>&gt;12 m.; &gt;10 f.</td>
<td>&gt;7.0 m.; &gt;6.3 f.</td>
</tr>
</tbody>
</table>

Results
The efficacy of prescribed PA and/or dietotherapy on CVD risk reduction were examined in 82 abdominal obese patients (age:42.64±13.56) included in 7wk randomized controled trial. To estimate the significant reduction on CVD risk factors between two patient,s groups with contol was used statistical method Manova. Improved VO2max at 17.16% from baseline promoted significant greater reduction in level of CVD risk factors (BWkg, %F, WHR, WR, LDL/HDL, HDL, TA-sist) in FAD (physical activity and diet) group than those in D (diet) group of obese patients. HDL was increased at 10.41% from baseline in FAD and decreased at 9.3% in D group (Fig. 1). To predict the effects of CVD risk management using logistic regression, exponent B was interpreted in terms of relative risk (“RR”). New index as logistic model in form of equation is: RR=108.2588–1.7689xSkin fold thickness-bicepsin+1.7087xBMIin–0.3993xHbin–2.9423xVO2max-expected mean value–10.5402xWHO in+0.0770x50%kcal/h. This method for prescription of programmed PA is proposed since the relative risk is upper than 1 (“RR”>1).

Fig. 1: Significant changes in level of VO2max and “major” risk factors for CVD and other NCD between FAD (physical activity and diet) and D (diet) groups of abdominal obese patients.

Conclusion
Significant reduction on CVD risk in FAD group, enlarged types of PA, enabled safe performance and avoid the risk of cardiovascular events at abdominal obese individuals were achieved through prescription and modelling of programmed PA using our method.

Reference