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Perspective

Recommended approach of the obese Greek military personnel

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The worldwide "escalating epidemic" of obesity merits a high priority for preventive strategies in the Greek Armed Forces. In this report a brief realistic approach of the overweight Greek military personnel based on new developments is presented.

Key word: Obesity, military personnel, Greek.

Overweight and obesity is one of the most serious public health problems of the 21st century and the leading preventable cause of death worldwide with increasing prevalence in adults and children. It is associated with large decreases in life expectancy and increases in early mortality (Mazokopakis et al., 2004). The worldwide "escalating epidemic" of obesity merits a high priority for preventive strategies in the Greek Armed Forces (Mazokopakis, 2003; Mazokopakis et al., 2004). A reliable evaluation of the overweight patient, as the first step in any therapeutic program, requires both clinical and laboratory information with main aims the determination of degree and type of obesity, and evaluation of morbidity and mortality risk (Bray and Ryan, 2000). However, the implemented policy of the Greek Armed Forces during the enlistment or periodic screening of military personnel appears to be insufficient, as the overweight standards are based only on weight-for-height assessment. Considering that obesity is a risk factor for productivity loss causing additional costs for the employer, a brief realistic approach of the overweight Greek military personnel based on new developments is presented in this report.

Obesity is characterized by an excess of body fat. A person's exact body fat percentage (the total weight of the person's fat divided by the person's weight) reflecting both essential fat and storage fat, generally cannot be determined. The most of available techniques for calculating estimated body fat percentage accurately [e.g. dual energy X-ray absorptiometry (DEXA), body average density measurement, bioelectrical impedance analysis, computed tomography (CT-scan), magnetic resonance imaging (MRI)] are expensive and not readily available clinically. The current clinical approach to obesity uses inexpensive and more practical indicators for its evaluation, as body mass index (BMI), waist circumference (WC), the ratio of WC divided by hip circumference (waist-hip ratio or WHR), or the ratio of WC divided by BMI (WC/BMI).

BMI describes relative weight for height, and is significantly correlated with an acceptable approximation for the assessment of total body fat for the majority of patients. This index is calculated from the Quetelet's formula (the body weight in kilograms divided by the square of the height in meters). Although BMI is a surrogate measure of fatness, it is inexpensive, simple to perform and functions in a satisfactory way for a few basic applications, such as surveillance of secular trends or regional variations within a country. The relationship between BMI and body fat differs with age and gender. For example, women are more likely to have a higher percent of body fat than men for the same BMI. On average, older people may have more body fat than younger adults with the same BMI. Moreover, the inability of BMI to distinguish between weight due to muscle and weight due to fat may affect the determination of degree and type of obesity, and therefore overestimates the prevalence of obesity among highly active military personnel (Mazokopakis et al., 2004). Different BMI cutoff points for the evaluation of overweight military personnel have been suggested and used. So, based on the classification of the World Health Organization, a subject (adult man or non-pregnant woman) is defined as normal when BMI is between 18.5 and 24.9 kg/m^2, as overweight when BMI is between 25.0 and 29.9 kg/m^2 and as obese when BMI is

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when BMI is $\geq$ 30.0 kg/m^2 (WHO, 1998). According to Healthy People 2000 standards, male and female military personnel are considered overweight if their BMI is > 25.8 kg/m^2 and > 25.7 kg/m^2 for men and women respectively under the age of 20, or BMI > 27.8 kg/m^2 and > 27.3 kg/m^2 for men and women respectively aged 20 or older (DHHS, 1991).

BMI should be used only as one part of the military's weight-screening process. The presence of excess fat in the abdomen disproportionate to total body fat is an independent predictor of risk factors and morbidity. Abdominal visceral adipose tissue (VAT) has been proposed as the major determinant of metabolic and cardiovascular complications of obesity. Although CT and MRI scans are the most accurate methods for evaluation of abdominal fat, these are expensive and not generally available for this purpose. The WC, the WHR, and the WC/BMI are the most practical clinical alternatives (Bray and Ryan, 2000; Heinrich et al., 2008). WC reflects both abdominal subcutaneous adipose tissue (SAT) and VAT, and is a general index of central (trunk) fat mass. WC is the most practical anthropometric measurement for assessing a patient's abdominal fat content before and during weight loss treatment and should be measured in conjunction with BMI. Adjustment of BMI for central adiposity is important particularly in the BMI range of 22 - 29 Kg/m^2 (Bray and Ryan, 2000).

Determining the patient's absolute risk status requires consideration of the degree of obesity as mentioned previously, as well as the presence of existing diseases or risk factors. To do so, it is necessary to take into account the patient's history, his physical examination, and the laboratory results. The detection of existing cardiovascular disease, end-organ damage, or cardiovascular and other risk factors (such as family history of premature coronary heart disease, hypertension, diabetes mellitus, dyslipidemia, cigarette smoking, physical inactivity, sleep apnea, weight gain since age 18), should be implemented in every obese patient (Bray and Ryan, 2000). Moreover, this recommended strategy can facilitate the diagnosis of metabolic syndrome, a clustering of atherosclerotic cardiovascular disease risk factors (Reilly and Rader, 2003). After the determination of risk-adjusted BMI, the overall risk assessment and treatment goals can be evaluated (Bray and Ryan, 2000).

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