

ABSTRACT

Background:

Childhood obesity is currently considered a worldwide public health problem that is becoming a health priority in many countries. The adequacy and selection of criteria for the assessment of growth in children and the optimum body mass index (BMI) cutoff points for obesity definition, both in clinical practice and in population studies are kept under discussion. Although, this discussion is far from being simple and a large span of issues come up and difficult even more the achievement to a conclusion. Moreover, sometimes arguments are only based in suppositions and in well educated guesses and fail to endorse themselves with reliable evidence. Thus, to avoid the consequences of great concern from children misclassification, we consider seeking for the adequacy of BMI cutoff criteria using their feasibility and capacity in predicting body fat (BF).

In this study we aimed to evaluate the diagnostic accuracy of CDC's, IOTF's and WHO's BMI cutoff points in the classification of overweight and obesity, compared to the percentage of BF estimated by leg-to-leg bioelectric impedance, in a Portuguese sample of school-aged children.

Methods:

A sample of 2377 elementary students (7-10 years, 47.9% girls), registered in the 33 public schools of Paços de Ferreira – Portugal, were evaluated during the spring of 2007. Weight and height were assessed, by one trained anthropometrist, according to the *WHO Training Course on Child Growth Assessment* and percent body fat (%BF) was measured using a body composition analyzer Tanita BF-666. Each cutoff point criteria was compared with %BF, considered as the gold standard, by the evaluation of sensitivity, specificity, positive (+PV) and negative predictive values (-PV), positive likelihood ratio (+LR) and diagnostic odds ratio (OR). We also made a ROC curve analysis. Statistical analyses were performed by SPSS and R software.

Results:

The highest sensitivity for classifying obesity was found using the WHO criterion (76.4%, 95%CI 72.6-79.9) and the lowest using IOTF cutoff points (44.1%, 95%CI 39.9-48.4). For overweight class sensitivity was higher for WHO cutoff points (91.5%, 95%CI 89.6-93.2), and the lower for IOTF criterion (78.4%, 95%CI 75.7-80.9). High specificity values were found for the three criteria but the IOTF showed the highest value (99.8%, 95%CI 99.6-99.9) for obesity, as well as for overweight (95.3%, 95%CI 94.1-96.3). From those children defined as obese by IOTF, 98.7% (95%CI: 96.6-99.7) were correctly classified (+PV), compared to 88.2% (WHO) and 93.3% (CDC). In overweight class +PVs were 79.1% (WHO) and 88.3%

(CDC), compared to IOTF 91.8% (95%CI: 89.8-93.5) of children determined to have overweight correctly classified. Independently of the population obesity prevalence (pretest probability), the IOTF criteria showed the best ability to classify individuals as obese (+LR 273.1, 95%CI 87.8-849.5), or as overweight (+LR 16.7, 95%CI 13.2-21.1).

Conclusion:

The WHO criterion seems to be better to detect obesity and overweight in children from a population. Although, to confirm the disease, namely in a clinical context, the IOTF criterion seems to be more accurate to define obesity and overweight.