Hypertension Research (2011) 34, 913–914

www.nature.com/hr

COMMENTARY

Evaluating risk factors in hypertension screening in children and adolescent

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Hypertension Research (2011) **34,** 913–914; doi:10.1038/hr.2011.73; published online 9 June 2011

The pediatric obesity epidemic has increased significantly over the last three decades.[1] This increase represents a problem for the healthcare system, as being overweight is directly associated with an increased probability of developing metabolic syndrome and high blood pressure.[2,3]

The screening performed by Fernandes *et al.*[4] used body mass index (BMI) and dual-energy X-ray absorptiometry (DXA), which is a more accurate method for assessing body composition, as DXA assesses three aspects of body composition: bone mineral, lipids (triglycerides, phospholipid membranes and so on) and lipid-free soft tissue. From these data, we can estimate fat mass, lean soft tissue mass, fat-free mass, soft tissue mass, total body mass and percent fat mass.[5] Moreover, this method is difficult logistically because the evaluation requires an appropriate location (laboratory or clinic) and in epidemiological studies, this is not always possible, as the individuals would have to travel to the laboratory/clinic to perform the evaluation.

However, we should highlight the benefits and drawbacks of this type of study, as the number of individuals who may benefit is small.[6] Moreover, the method used by Fernandes *et al.*[4] is simple and rarely causes complications in subjects.[5] Regarding the measurement of blood pressure, the authors used an electronic device validated for this population. Thus, our initial conclusion is that the methods used to assess obesity and body fat were appropriate and that high blood pressure posed no risk to the health of the individuals, which is an important point in screening studies.

Faced with this difficulty, anthropometry has been considered an efficient and feasible method for diagnosing obesity in epidemiological studies because of its simplicity and cost effectiveness. The principal anthropometric indicators used in studies have been BMI as an indicator of general obesity and waist circumference as an indicator of abdominal obesity.[7] The international reference has been used for the classification of obesity based on BMI, which allows the possibility of comparison between studies from different countries. However, among adolescents, these cutoffs have shown low positive predictive value for excess body fat.[8] Therefore, it is more appropriate to use diagnostic criteria for obesity developed from samples of Brazilian adolescents, as they better represent the miscegenation of this population.

Another important point in the article by Fernandes *et al.*[4] was to compare the predictor performance of blood pressure at different cutoff points for obesity from the body fat. The differences in results may be partly explained by such methodological aspects. Another factor that may have influenced the recorded prevalence is the question of measurement accuracy. Differential or non-differential misclassification effects (error due to disease status or exposure) of obesity prevalence are unpredictable and may have caused the underestimation or overestimation of the true prevalence. In the context of this study, it is likely that the validity of the diagnostic criteria and tools used varied for each characteristic of the adolescents studied.[9]

Wald and Morris[10] have been investigating risk factors as potential screening tests, as some risk factors are directly associated with a disease and would suggest the need for screening. These analyses are important, because risk factors are usually poor predictors of disease, and this is reflected in the low positive predictive values presented by Fernandes *et al.*,[4] which were $<60\%$ (Figure 1).

BMI and body fat are optimal risk indices for the development of hypertension.[4] Thus, the most important contribution of this study was to demonstrate the high prevalence of

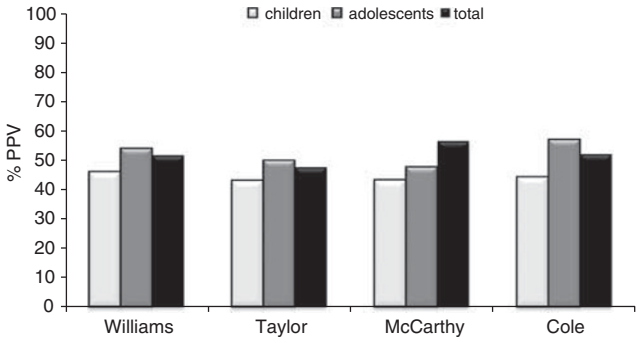

Figure 1 Perceptual (%) values of positive predictive value (PPV) for diagnosis of the elevated blood pressure from Fernandes *et al.*[5] according to obesity cutoff points proposed by the authors described.

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obesity and high blood pressure in children and adolescents in a developing country. This demonstrates the need for obesity reduction intervention in this population, as multicomponent intervention can have beneficial effects on several cardiovascular risk factors.

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