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Correlation between psoriasis' severity and waist-to-height ratio[*]

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Abstract: In the absence of ideal biomarkers, the research for clinical markers correlated to the severity of psoriasis and/or its comorbidities becomes crucial. Recently, studies have shown positive correlation between body mass index and prevalence and severity of psoriasis. Abdominal circumference showed stronger correlation with disease severity than body mass index. We evaluated the waist-to-height ratio in a sample of 297 adult patients with psoriasis and observed that it has a significant correlation with body mass index and PASI, and together with body mass index allows the identification of central obesity, reducing its subdiagnosis.
Keywords: Anthropometry; Comorbidity; Obesity; Psoriasis

We have previously demonstrated that the severity of psoriasis measured by PASI (*Psoriasis Area Severity Index*) in a Brazilian population presents a significant correlation with anthropometric measurements, such as Body Mass Index (BMI), Waist-to-Hip Ratio (WHR) and Waist Circumference (WC), especially the last two.[1]

Recent studies show that Waist-to-height Ratio (WhtR) has a stronger correlation with cardiovascular diseases than WC.[2,3] Paller and cols. (2013) demonstrated that children with psoriasis have greater averages of WhtR than non-affected children. As it is not adequate for different ethnicities/ages, muscle mass levels, bone structure and not measuring central adiposity, BMI does not seem to be the best method for follow-up of patients with psoriasis even though it is still the most recommended by all guidelines.[5,6,7] We performed a cross-sectional study in which minimum sampling size (292) was calculated based on obesity prevalence in Bahia, around 5%, according to data from IBGE 2002 – 2005 Pesquisa de Orçamentos Familiares (Family Budgets Survey). A prevalence variation of 5% was considered, and then the formula $N = z.p.q/d^2$ was used, where Z=1.96, P=prevalence, Q=(1-P) and d=error margin (±2.5%). New and subsequent patients were enrolled, totaling 296 patients in the period from October/2008 to August/2010. We evaluated WhtR in a sample of 297 adult patients with psoriasis, 289 of which had complete anthropometric measurements.

A structured questionnaire was used for data collection. The results of the obesity prevalence study were previously published[1]. Descriptive statistics were done with the help of SPSS version 20.0 for Windows, the continuous variables described through means (± standard deviation) as well as medians and interquartiles, while categorical variables were described as proportions. The quantitative variables studied were submitted to the normality test of Kolmogorov-Smirnov. The significance level adopted was of 5%.

The mean ± standard deviation (SD) of PASI for the sample was of 8.1 ± 7.8 (median 5.3; p25=2.7 and p75=10.9). WhtR varied from 0.38-0.92 with mean ± SD of 0.57 ± 0.08 and median of 0.56.

PASI for the 243 patients with WhtR ≥0.5 had a median of 5.7, significantly greater than in the 48 patients with WhtR <0.5, 3.7 (*Mann Whitney*; p=0.03). Correlation between WhtR and BMI was of 0.86 (*Spearman*, p<0.01). Correlation between WhtR and PASI was of 0.14 (*Spearman*, p=0.01).

TABLE 1: Comparison of abnormal findings of WhtR and BMI based on cutoff points for obesity

Anthropometry	BMI < 30kg/m2	BMI > 30kg/m2	Total
WhtR < 0.5	46	0	46
WhtR > 0.5	161	82	243
Total	**207**	**82**	**289**

Table 2: Distribution of WhtR frequencies and description of subgroups as per BMI cutoff points ("normal", "overweight" and "obese"). BMI in kg/m^2

WhtR frequencies	N; %	BMI < 25	BMI > 25<30	BMI > 30kg
0.38 ├ 0.44	11; 3%	11 (100%)	0	0
0.44 ├ 0.5	35; 12%	33 (94%)	02 (6%)	0
0.5 ┤ 0.92	243; 84%	51 (21%)	110 (45%)	82 (33%)

Among 243 patients with alteration in anthropometric measure (BMI or WhtR), only 82 (33%) were detected by BMI (Table 1). In table 2 we observed that 110 patients whose WhtR showed obesity were classified as "overweight" instead of "obese" by BMI. When WhtR was <0.5, no obese patient was found according to BMI.

The importance of a clinical marker correlated to the severity of psoriasis resides in the fact that we still do not have ideal biomarkers.[8] WhtR is found to be an accessible method, with an equal cutoff point for both sexes, correlated to obesity, cardiovascular disease and diabetes mellitus.[2,3] Considering that there is still no consensus about which is the best method, WhtR in this sample was quite correlated with obesity in patients with psoriasis, avoiding the problems of using BMI alone, besides presenting a positive correlation with PASI values.

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