



Is 24-hour blood pressure monitoring necessary in obese children and adolescents ?

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Introduction

Arterial hypertension (AH) is one of the most common and the earliest complications of childhood obesity. It is diagnosed on the basis of at least three results of the standard setting measurements of systolic (SBP) and diastolic (DBP) blood pressure. Nevertheless, some data suggest, that this diagnostic standard may be not sufficient for obese children, because some BP abnormalities, unique for these patients, (decrease of night dip, elevated SBP/DBP load) cannot be recognized on the basis of the standard AH definition. Therefore an alternative, supplementary diagnostic method is needed.

Objective

The assessment of the usefulness of 24h ABPM in the diagnosis of BP disorders in obese children and adolescents.

Material

N=130 (72 girls, 58 boys), mean age 13.3 years, 95%CI 12.8-13.7, mean BMI SDS 4.54, 95%CI 4.2-4.8

Methods

•Body weight and height measurement (stadiometer and balanced scale)

•Casual blood pressure measurement; 3 times after 10 minutes of rest

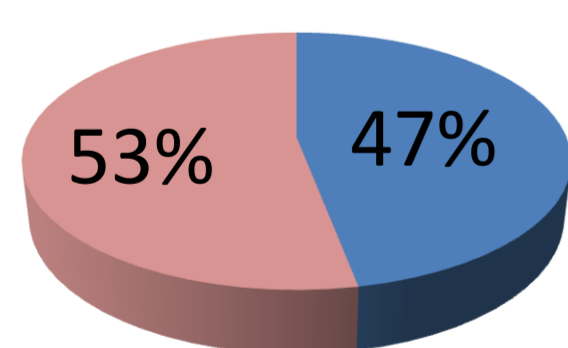
•24h ABPM (Spacelabs 90217,USA) reading every 15 minutes (day 6 a.m.-10:59 p.m.), and every 30 minutes (night 11:00 p.m.-5:59 a.m.). Recordings with at least 70% valid readings and at least one reading every hour were considered for the analysis.

The following parameters were analyzed: mean 24-h systolic, diastolic, and mean arterial pressure (MAP), mean day-time systolic (dSBP), diastolic (dDBP), and MAP (dMAP), mean night-time systolic (nSBP), diastolic (nDBP), and MAP (nMAP). Blood pressure load was calculated separately for the awake and sleep periods. BP load was defined as the percentage of valid ambulatory BP measurements above a set threshold (95th percentile for sex and the height) value. Loads in excess of 30% were considered elevated. Loads in excess of 50% were considered severely elevated. The calculation of nocturnal dipping was based on a formula by the American Heart Association: $[(dSBP - nSBP) / dSBP] \times 100$. Normal dipping was defined as a $\geq 10\%$ decline. White coat AH was defined as a AH in CBP but not in ABPM. Masked AH was defined as a CBP within normal ranges, but AH in ABPM.

Results

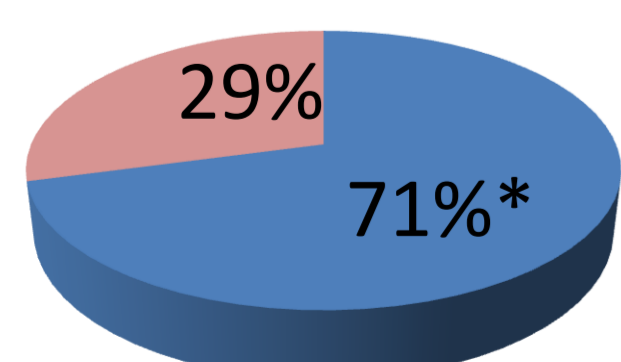
AH in CBP

■ YES ■ NO



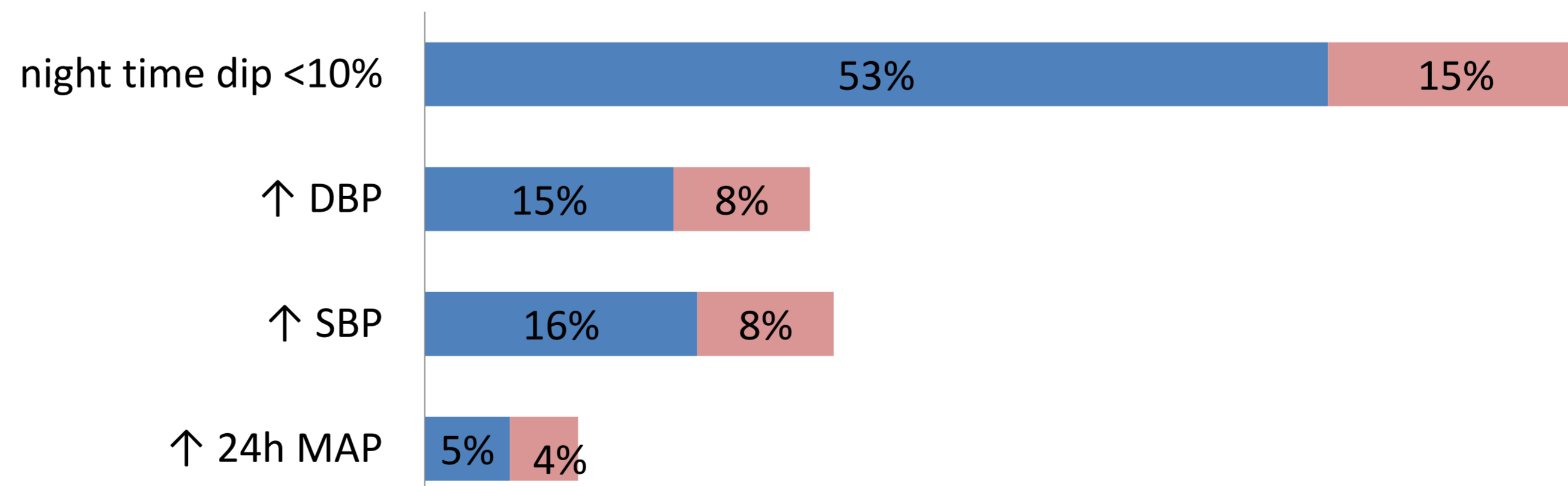
Abnormalities in 24h ABPM

■ YES ■ NO



*only 26,9% previously diagnosed with AH

■ 24h ABPM ■ AH in CBP



Elevated (>2.0 SD) 24-h mean arterial BP was diagnosed in 7 (5,4%) patients, and only in 3 with AH. An elevated SBP and DBP load were observed in 39 (16%) and 19 (14,6%) patients respectively; only 20 and 10 respectively met criteria for AH. The decrease ($<10\%$) of the night time dip was present in 69 (53%) of the patients, and only 20 of them were diagnosed with AH.

Conclusions

The majority of obese children and adolescents have an abnormal BP profile, that can be not recognized on the basis of the standard setting BP measurements. Therefore 24h ABPM should be considered as a supplementary method in the diagnosis AH in obese pediatric patients.

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