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Percentiles for central blood pressure in childhood

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Objectives:

Aim of this study was to generate percentiles for central systolic blood pressure noninvasively in children and young adults living in Germany with an oscillometric device.

Methods:

2206 children, adolescents and young adults living in Germany (mean: 13.2 years; range 8.0-21.9 years; 49.1% female) were recruited from different school and community types. Peripheral (pSBP) and central systolic blood pressure (cSBP) were obtained noninvasively by an automatic oscillometric device (Mobil-O-Graph, I.E.M., Germany) after 5 minutes rest in supine position. Subjects with hypertensive BP values (systolic/diastolic blood pressure > 95th percentile) and/or obesity (BMI >97th percentile) were not included into the reference population (n= 761). Percentiles are calculated using LMS-chartmaker-pro to fit smooth centile curves. With this method the changing distribution according to some covariate is presented as median (M), coefficient of variation (S) and skewness (L). Reference centiles for cSBP with regard to age and body height are presented for girls (f) and boys (m).

Results:

cSBP was positively correlated with age ($r=.457$), height ($r=.483$) and pSBP ($r=.798$); (all $p<.001$). For the reference percentiles 1445 (49 % female) subjects fulfilled the inclusion criteria. Only cSBP values of normotensive, non-obese participants were used to calculate the reference percentiles. cSBP was higher in boys from 14 years onwards and ranges were wide for both sexes (boys:74-136 [mmHg]; girls: 75-123 [mmHg]). The reference percentiles for cSBP differ slightly according to sex. The curves for boys show a steeper increase until the age of 14 compared to girls. The reference percentiles for girls are smoother all over the age range.

Conclusions:

Centiles for cSBP can be helpful in the difficult decision-making process for treating (pre)hypertension in youth. Practical implications for clinical use of these reference percentiles have to be clarified in following studies.