

Blood pressure measurement procedure at an out-patient pediatric cardiology unit

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Blood pressure measurements in children are recommended to be assessed as the mean of three recordings. In daily practice, however, blood pressure measurements are often assessed after one single recording. This procedure may be convenient for the child but may result in an unreliable estimate.

Aim: To compare blood pressure values obtained after one single recording with mean blood pressure values obtained after three consecutive recordings.

Patients and Methods: A total of 125 boys, median age 10.3 years (0.1-18.7) and 119 girls, aged 10.5 years (0.1-18.3) were recruited from February to December 2010, during their regular visit at a secondary out-patient pediatric cardiology unit. The children were divided into 5 groups: 1. Healthy, 2. Congenital heart defects, 3. Arrhythmias, 4. Cardiomyopathies and 5. Other diseases. Blood pressure was measured with the child in a sitting position in children over one year of age. Standard oscillometric equipment was used with three consecutive measurements completed during 10-15 minutes with the cuff on the right forearm. Results were given as one single value of the first recording and as the mean of three consecutive recordings for each child. All the children underwent ECG and echo-cardiography investigations which were normal in all the children in group 1 (Healthy).

Results: Systolic and diastolic blood pressure values decreased from the first to the third recording with a mean of 2.2 (-24 to 20) and 2.8 (-28 to 25) mmHg, respectively, in the total cohort of children ($p < 0.0001$). The first systolic and diastolic recordings were 1.0 (13 to -9) and 1.2 (17 to -10) mmHg higher than the mean values, respectively ($p < 0.0001$). The differences between the first and third recordings and one single recording and the mean of three, were the same in all the groups ($p = 0.9$ and $p = 0.7$, respectively). No correlations with age or length were observed.

Conclusion: Blood pressure values assessed as the mean of three recordings are slightly lower than those assessed after one single recording. The difference is trivial; however, indicating that one single recording of blood pressure is acceptable in children, provided the observed value is within the normal range.