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Relation between Blood Pressure Indices and Nocturia Severity in Adolescents

Nocturia, defined as waking to void during sleep hours, is common in adolescents and may indicate underlying cardiovascular risk. Our group found that nocturia is strongly associated with hypertension in adolescents. It is widely accepted that elevated diastolic blood pressure (DBP) is more strongly associated with cardiovascular risk in young adults. Previous studies have linked nocturia to systolic blood pressure (SBP) elevation in adults. It remains unclear which blood pressure (BP) indices are most strongly correlated with nocturia severity in adolescents. This study addresses this issue while also characterizing the association between nocturia and BP elevation. We recruited 100 adolescents, ages 10-18 years with mean age of 14 years, from pediatric clinics. Peripheral and central BP, using non-invasive applanation tonometry, were obtained. Nocturnal-only voiding diaries were collected. Spearman's rank correlation coefficient was used to assess the relationship between BP and nocturia indices. Amongst all subjects, 45 reported nocturia. Peripheral SBP and central BP showed moderate positive correlations with nocturia frequency (highest SBP of both arms r = 0.331, p=0.001; central SBP r =0.267, p=0.007). The highest SBP was significantly correlated with nocturnal urine volume (NUV) (r = 0.31, p = 0.001) and nocturnal urine production (NUP) (r = 0.32, p = 0.001). Highest SBP of both arms did not correlate with maximum voided volume (MVV) (r = 0.11, p=0.25). DBP showed no significant correlation. After adjusting for BMI and sex, SBP remained a significant predictor of nocturia severity. These findings suggest that SBP is strongly associated with nocturia frequency, NUV, NUP, but not MVV. Therefore, higher SBP is associated with nocturia severity and increased NUP but not lower bladder capacity.