Abstract

Association between antihypertensive medication use and body mass index on blood pressure in US adults from 1999-2014
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Background: There are many dosing and metabolic differences in obesity that may alter the effectiveness of pharmacotherapy. The first objective of this study was to determine if blood pressure attained using various antihypertensive medications differs by body mass index (BMI). Because many medications are known to have other metabolic effects, the second objective of this study was to determine if the use of antihypertensive medications is associated with differences in glucose, lipid, and waist circumference (WC) levels, independent of BMI.

Methods: A total of 14,630 individuals with hypertension aged 18 y and over from the National Health and Nutrition Examination Survey (NHANES) from 1999-2014 were included in this study. Participants were categorized by antihypertensive medication type (ACE inhibitors, beta blockers, diuretics, ARBs, CCBs, and Other) and BMI category.

Results: Individuals using antihypertensive medication had significantly lower blood pressure than non-users ($P < 0.05$). In females, the difference in blood pressure between users and non-users of ACE inhibitors, ARBs, and diuretics was significantly greater in those with obesity compared to normal weight and overweight individuals ($P < 0.05$). The effect of antihypertensives on blood pressure did not vary by BMI in males ($P > 0.05$). Antihypertensive medications were inconsistently associated with differences in glucose, lipid, and WC. Plasma glucose levels were highest in those using ACE inhibitors compared to all other antihypertensive medication types ($P < 0.05$). BBs were associated with higher triglyceride levels than ARBs and Other antihypertensive medications ($P < 0.05$). Females that were using ACE inhibitors had a higher WC than diuretic users and non-antihypertensive users ($P < 0.05$).

Conclusion The findings from this study suggest that ACE inhibitors, ARBs, and diuretics may be associated with better blood pressure outcomes for those with obesity. However, in contrast to published literature, this study also found that ACE inhibitors were associated with elevated WC and glucose levels. Therefore, health care professionals should consider obesity status in addition to the potential side effects of each antihypertensive medication on cardiometabolic risk when prescribing antihypertension medications.

ACE- angiotensin converting enzyme
ARB- angiotensin receptor blocker
CCB- calcium channel blocker
SBP- systolic blood pressure
DBP- diastolic blood pressure