The aim of this study is the assessment of the relation between sodium sensitivity and insulin resistance in normo and hypertensive non-diabetic individuals. Nineteen normo and 19 hypertensive subjects were enrolled in the study groups. Both groups were similar regarding to age, sex, family history, smoking status, end organ damage, and secondary causes of hypertension. In the first step, all of the antihypertensive medications were stopped and patients were followed through a 3 week wash-out period. Following this period, insulin resistance was assessed with hyperinsulinemic euglycemic clamp technique. Patients were inquired to consume a low sodium (2g/day) or high sodium (14g/day) containing diet in a random fashion for one week. At the end of each week, 24 hour ambulatory blood pressures were obtained in order to assess sodium sensitivity, that means a difference of more than 10% in the mean arterial pressure between high and low sodium diets. The prevalence of insulin resistance was not significantly higher in the hypertensive group compared with normotensive subjects (63.2% vs. 42.1% respectively, NS) while the prevalence of sodium sensitivity was significantly higher in the hypertensive group (63.2% vs. 26.3% respectively, p<0.05). When the patients were separated into two groups according to sodium sensitivity and disregarding the status of blood pressure, the prevalence of insulin resistance in sodium sensitive subjects was 94.1% while that was only 19% in non sodium sensitive ones (p<0.0001). There was a significant correlation between sodium sensitivity (delta MAP) and insulin resistance (M score) (r= -0.65, p<0.0001). In subgroup analysis, insulin resistance was more prevalent in normotensive sodium sensitive (100%) and hypertensive sodium sensitive (91.7%) groups compared with hypertensive non sodium sensitive (14.3%) and normotensive non sodium sensitive (21.4%) groups (p<0.0001). In conclusion, we found a high prevalence of sodium sensitivity, but not insulin resistance in hypertensive patients compared with normotensive subjects, while insulin resistance was found to be significantly associated with sodium sensitivity in the complete study group.