Introduction: Weight reduction is recommended to improve blood pressure in obese subjects. Different hypocaloric diets have been tested for their influences on body weight, but data on ambulatory blood pressure are rare.

Methods: We randomly assigned 102 obese subjects to either a carbohydrate reduced (< 90 g/d) or a fat reduced diet (< 30% calorie intake from fat) over 6 months. Participants were not on antihypertensive medications. We assessed 24h-ambulatory blood pressure (ABPM) at baseline and month 6. All data are given as mean±SD. We used paired t-tests for within group comparisons and compared differences between groups by unpaired t-test.

Results: 36 participants in the reduced carbohydrate and 42 participants in the reduced fat diet group completed the study with successful APBM measurements. BMI decreased 2.6±1.4 kg/m² in both diet groups (p< 0.01 each group). Systolic ABPM decreased 3±7 mm Hg with reduced carbohydrate and 3±10 mm Hg with reduced fat diet (p< 0.05 each group). Diastolic ABPM changed 1±5 mm Hg with reduced carbohydrate and 2±9 mm Hg with reduced fat diet (ns). At baseline, 43 of the completers showed a nocturnal blood pressure reduction < 10% (non-dippers), whereas 35 of the completers were dippers. The number of non-dippers decreased from 43 to 20 with weight loss. With weight loss, non-dippers only reduced nocturnal blood pressure (systolic 115±10 to 110±14 mm Hg, p< 0.001; diastolic 68±9 to 64±8 mm Hg, p< 0.001). In contrast, dippers only reduced daytime blood pressure (systolic 124±9 to 120±10 mm Hg, p< 0.05; diastolic 78±7 to 76±8 mm Hg, p=0.047).

Conclusion: Carbohydrate and fat reduced hypocaloric diets elicit similar ABPM reductions in obese subjects. With weight loss, dippers primarily reduce daytime blood pressure, whereas nocturnal blood pressure decreases in non-dippers. Thus, office blood pressure measurements may be misleading in weight loss studies.