A Case Control Study Of Blood Pressure Changes Among Fallers In An Urban Older Malaysian Population

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TITLE
A CASE CONTROL STUDY ON BLOOD PRESSURE CHANGES AMONG FALLERS IN AN URBAN OLDER MALAYSIAN POPULATION

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Background

Fallersexperience increased morbidity and mortality with potentially devastating psychological and socioeconomic impact on society. Despite orthostatic hypotension being considered a risk factors for falls among older people, no previous study has documented a direct relationship between postural changes in blood pressure and falls. We conducted a case-control study to determine potential differences in blood pressure changes between fallers and non-fallers.

Methods

Participants aged ≥65 years with 2 or more falls or one injurious fall in the previous 12 months were recruited. Age-matched control participants were recruited from community dwelling older volunteers. Blood pressure changes were assessed using non-invasive beat-to-beat blood pressure monitoring (Portapres, Amsterdam or Taskforce, Austria), in the supine position and during 3 minutes of standing. Orthostatic hypotension was defined as a 20mmHg and 10mmHg reduction in systolic (SBP) or diastolic (DBP) blood pressure.

Results

Beat-to-beat blood pressure data was available for 117 fallers and 89 non-fallers, mean (SD) age = 75(7), 69% women. Older fallers were significantly more likely to fulfill the diagnostic criteria of OH (p<0.001). Fallers were also more likely to fulfill the criteria of SBP drop ≥ 30mmHg (p<0.001), SBP drop ≥40mmHg and DBP drop ≥20 mmHg (p=0.016). The strongest association was obtained with the cut-off of SBP ≥30 mmHg without taking DBP into account. The cut-off of SBP ≥30mmHg differentiated our cases from controls with a sensitivity of 40% and a specificity of 92%.

Conclusion

Our study has demonstrated a strong association between postural blood pressure drop and falls. While individuals with recurrent and injurious falls were significantly more likely to have documented OH using continuous BP
measurements, many non-fallers also fulfilled the diagnostic criteria for OH. The cut-off of SBP drop ≥30mmHg on the other hand differentiated our fallers and non-fallers with 92% specificity, suggesting that the existing cut-offs for OH are too low and may not be suitable for postural BP changes assessed with continuous BP monitoring.