Higher Day-Time Ambulatory BPV Predicts Long Term Functional Outcome

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Introduction

Increases in blood pressure variability (BPV) have been observed following acute stroke, present specific challenges for acute BP management, and may be associated with short-, mid-, and long-term clinical outcomes post-stroke. In this prospective observational study, we investigated the long-term prognostic significance of BPV post-acute ischaemic stroke (AIS) and transient ischaemic attack (TIA) using day-time (0700 to 2159) ambulatory blood pressure monitor (ABPM) values.

Methods

- Multi-centre prospective observational study in AIS and TIA patients (n=232)
- Baseline (≤48hrs) ABPM readings at 20-minute intervals during day-time (Figure 1)
- Acceptability defined as ≥14 readings
- BPV defined as standard deviation (SD, mmHg) and coefficient of variation (CoV, %) using four BP parameters:
  - systolic BP (SBP); diastolic BP (DBP); mean arterial pressure (MAP); pulse pressure (PP)
- Functional assessments at 12 months post-stroke using the modified Rankin Scale (mRS); independence defined by mRS ≤2
- Multivariable logistic regression was completed; odds ratio, 95% confidence intervals and p-values were reported

Figure 1 ABPM

BPV	Day-time ABPM		
	mRS<3 (n=115)	mRS≥3 (n=17)	P
SBP SD	13.4 (10.2 – 18.6)	10.9 (9.1 – 15.8)	0.18
SBP CoV	9.8 (7.3- 13)	8.1 (7– 11.04)	0.2
DBP SD	7.6 (9.8 – 14)	8.5 (7.5-8.7)	0.05
DBP CoV	12 (9.7 – 16.7)	10.6 (9.3-11.1)	0.07
MAP SD	10.4 (8.6- 14)	10 (8.1- 11.3)	0.21
MAP CoV	10.6 (8.6 – 15.1)	9.4 (8.9 – 11.1)	0.25
PP SD	10.6 (8.6 – 15.2)	8.4 (7.6 -11.3)	0.05
PP CoV	18.2 (14.3 -25.3)	16 (11.6 – 19.8)	0.07

Table 1

Summaries and comparisons of baseline day-time ABPM BPV values by 12 month mRS score

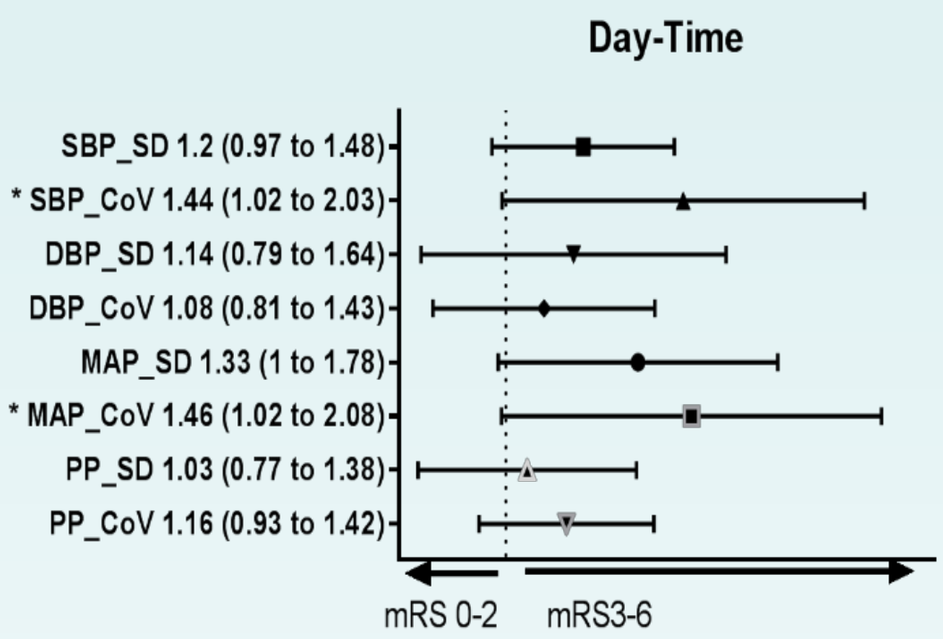

Figure 2

Increasing values of CoV_{SBP} and CoV_{MAP} were independent predictors of functional outcome

Results

Acceptable day-time ABPM readings were completed in 115 independent [median (IQR) age 69 years (63-76); 77 (67%) male; 100 (87%) white British] and 17 dependent [median age 79 years; 9 (52.9%) male; 17 (100%) white British] patients. Dependents (mRS ≥3) were significantly older, with a higher burden of pre-morbid conditions, increased pre-morbid and baseline dependency, and increased stroke severity. No significant differences in BPV values were observed (Table 1), but increased BPV, defined as the CoV_{SBP} and CoV_{MAP} independently predicted poor functional outcome at 12 months post-event (Figure 2).

Conclusion

Increased baseline day-time ABPM variability, defined by CoV of SBP and MAP, predicts long-term dependence (mRS ≥3) following AIS and TIA.