

Comparison of short term BP variability in normotensive and hypertensive patients

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Background

- In spite of controlled BP some patients developed target organ damage (TOD) like stroke, IHD. So, there must be some factor that contribute to develop TOD.
- BPV is a new therapeutic target in hypertension management in addition to mean BP values lowering.

- Therefore, this study was carried out to compare the short term BP variability in hypertensive and normotensive patients.

Methodology

- This cross sectional study, was conducted in ‘Hypertension and Research Center, Rangpur’.
- We have enrolled 100 hypertensive patients and 100 normotensive attendants without history of CVD, DM and CKD.

Methodology....

- BP was measured using an automated Omron 7120 device both at the center and at home, after ensuring accurate measurement technique.
- Before home BP measurements, we conducted pretests at our center to identify any incorrect patient measurements.

Methodology....

- Two readings was taken each time and the first was discarded.
- BP was measured at specific interval from early morning to night.

- ✓ 1st BP between 4 to 6 AM
- ✓ 2nd BP 6 to 9 AM
- ✓ 3rd BP 11AM
- ✓ 4th BP 1 PM
- ✓ 5th BP 5PM
- ✓ 6th BP 7 to 9 PM
- ✓ 7th BP 10 to 12 PM)

Methodology....

- After collecting data, we analyzed recorded BP values to calculate variability.

Operational definition

- Dipping of BP (Dipper)- night time SBP reduce more than 10% than daytime SBP.
- Short term BPV (non-dipper) - if nocturnal systolic BP decreased by less than 10% from the daytime average or increased above daytime levels.

Operational definition.....

- Reverse dipping (Reverse dipper)- night time SBP increase than daytime SBP.

Result

- The mean age for hypertensive and normotensive groups was 53.11 ± 9.53 and 38.10 ± 04 years, respectively.
- Female was higher in both groups (51% and 66% respectively).

Result....

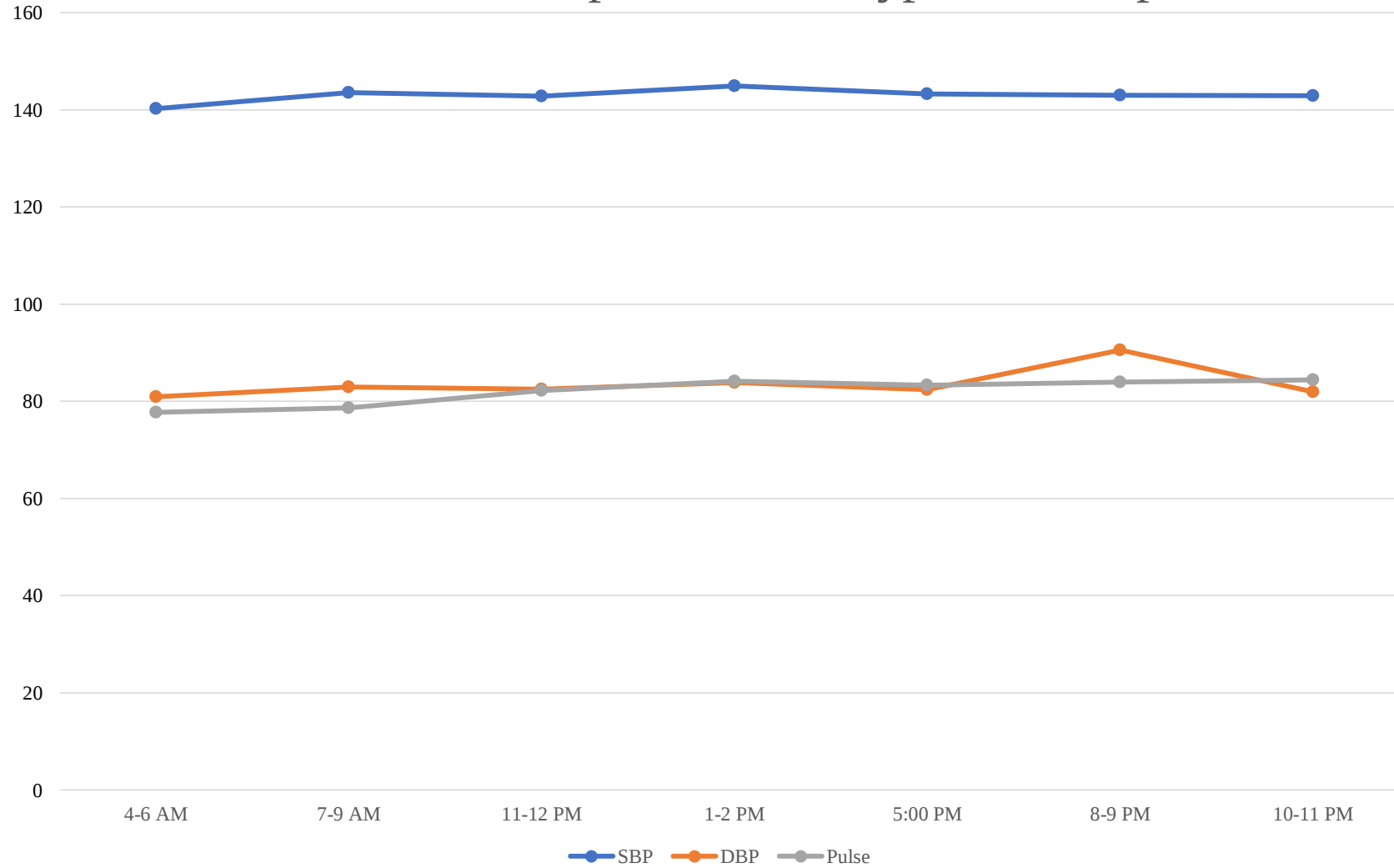
Hypertensive patients	
Office BP (average)	142.61/85.92 mmHg
Home BP (average)	143.49/83.91 mmHg

- 49% exhibiting higher home than office BP readings.

Result....

Normotensive	
Office BP (average)	110/70 mmHg
Home BP (average)	109/75 mmHg

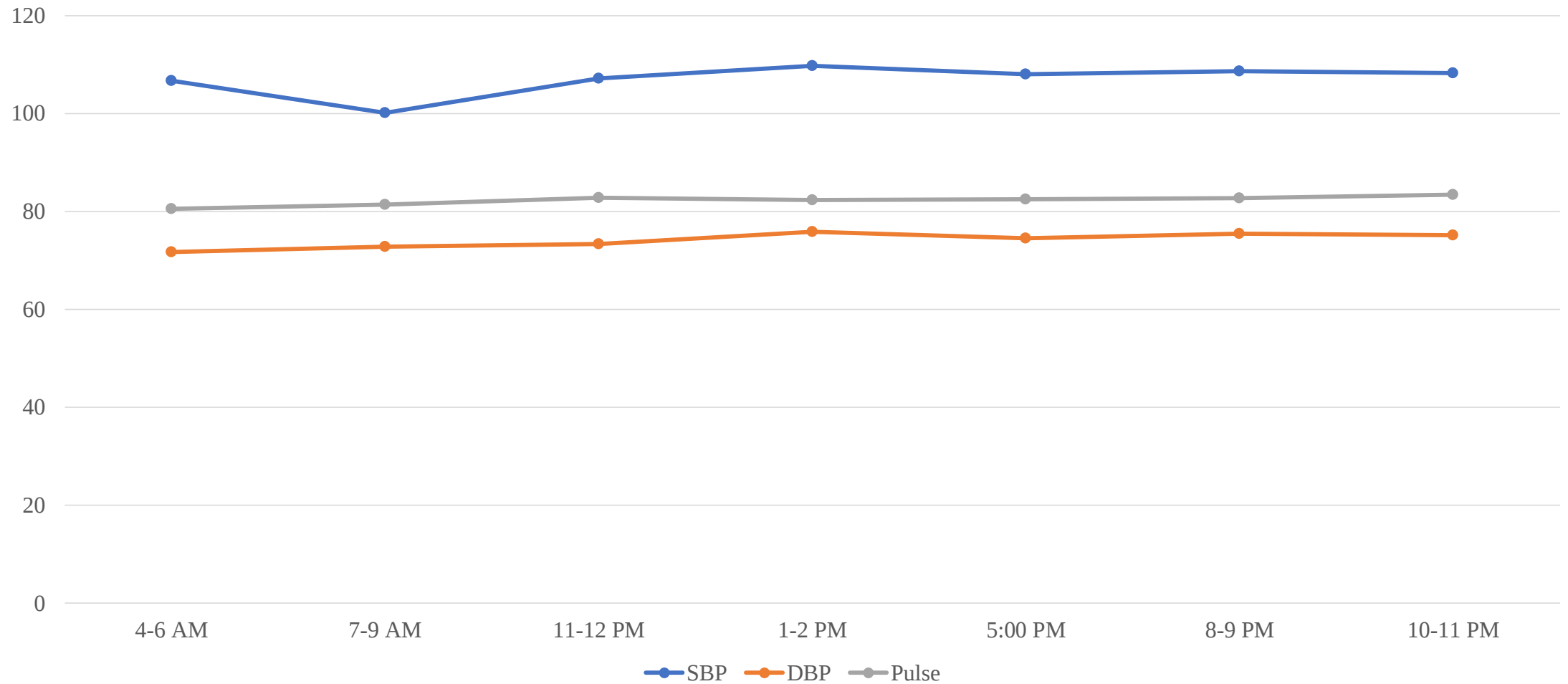
Mean BP and pulse of the hypertensive patients



Result....

Hypertensive patients	
Morning BP (average)	143.36/83 mmHg
Daytime BP (average)	156.69/83.92
Night time BP (average)	142.72/82.72

Mean BP and pulse of the normotensive patients



Result....

Normotensive respondents	
Morning BP (average)	107.63/74.25 mmHg
Daytime BP (average)	109.09/75.77 mmHg
Night time BP (average)	110.11/75.61 mmHg

Result....

	Hypertensive	Normotensive
BP variability	99%	100%
Non-dipper	64%	42.9%
Reverse dipper	35%	57.1%

Result....

- Office BP control was achieved in 31% of hypertensive patients.
- While home BP control was observed in 18%
- 51.6% of those with controlled office BP also had controlled home BP.
- Whereas only 2.9% of patients with uncontrolled office BP showed controlled home BP.

Discussion...Non-dipping in normotensive

- The prevalence of non-dipping BP in other study~30%.
- In our study, non-dipping BP was 42.9%.

Ohkubo T, Hozawa T, Yamaguchi J, Kikuya M, Ohmari K, Michimata M, et al. Prognostic significance of the nocturnal decline in blood pressure in individuals with and without high 24-h blood pressure: the Ohasama study. J Hypertens. (2002) 20:2183–9.

Discussion...Non-dipping in hypertensive

- The prevalence of non-dipping BP 39.4% (Sierra et al.).
- In our study, non-dipping BP was 64%.

De La Sierra A, Redon J, Banegas JR, Segura J, Parati G, Gorostidi M, et al. Prevalence and factors associated with circadian blood pressure patterns in hypertensive patients. Hypertension. 2009;53(3):466–72.

Discussion...reverse dipping

- It has been suggested that reverse dipping is a stronger predictor of CV risk than non-dipping.
- In one study, although both non-dipping and reverse dipping were significantly associated with CV events, reverse dippers had a higher incidence of adverse CV events after a median 5.7-year follow-up

Discussion...reverse dipping

- Sierra et al found 13.5% reverse dipping in hypertensive pts
- In our study, 35% of the treated hypertensive patients had reverse dipping.

De La Sierra A, Redon J, Banegas JR, Segura J, Parati G, Gorostidi M, et al. Prevalence and factors associated with circadian blood pressure patterns in hypertensive patients. Hypertension. 2009;53(3):466–72.

Discussion...reverse dipping

- Among both treated and untreated patients, non-dippers were typically older and more likely to be female.
- They were also more likely to be obese and have a longer duration of hypertension compared to dippers.^{1,2}

1. De La Sierra A, Redon J, Banegas JR, Segura J, Parati G, Gorostidi M, et al. Prevalence and factors associated with circadian blood pressure patterns in hypertensive patients. *Hypertension*. 2009;53(3):466–72.
2. Brotman DJ, Davidson MB, Boumitri M, Vidt DG. Impaired diurnal blood pressure variation and all-cause mortality. *Am J Hypertens*. 2008;21(1):92–7.

Discussion....

	Non-dipper	Reverse dipper
Age (mean years)	53.67	52.34
Sex- Female predominant	62.5%	71.4%
Overweight	45.3%	31.4%
Obese	10.9%	28.6%
Duration of hypertension	9.56 years	9.89

Discussion.....

- Elevated nighttime BP may be a more clinically useful predictor of CV disease than daytime levels.
- Nocturnal hypertension as a nighttime BP $\geq 120/70$ mmHg.
- In our study nocturnal hypertension was present in
 - 94.5% of the hypertensive patients and
 - 17.5% normotensive patients.

Conclusion

- The study reveals significant short-term blood pressure variability (BPV) among both hypertensive and normotensive subjects, with notable differences in home and office BP measurements.

Limitation

- Automated device was used instead of ABPM

Recommendation

- Further research utilizing ambulatory blood pressure monitoring (ABPM) and larger sample sizes is recommended to enhance understanding and management of blood pressure variability.

THANK YOU ALL