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**Diurnal Variation of Blood Pressure Among
Hypertensive Patients**

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Summary (Abstract):

Blood pressure is featured by being variable during the day. In normal individuals, blood pressure reaches the highest level in mid-morning and then falls progressively throughout the remainder of the day. Having an abnormal blood pressure pattern, such as hypertension means that the normal diurnal variation of blood pressure will be different. Leading up to this, there will be problems occurring consequently from these changes. This report demonstrates the diurnal variation of blood pressure among hypertensive patients and the different dipping patterns observed during nighttime.

Introduction:

Hypertension is defined as having a blood pressure higher than 140 over 90 mm/Hg, with consensus across medical guidelines.¹ Blood pressure has a daily pattern,² it is normally lower at night while you're sleeping and starts to rise a few hours before you wake up and continues to rise during the day, usually peaking in the middle of the afternoon, then in the late afternoon and evening, it begins dropping again. In most normotensive individuals the cycle starts with a rise in pressure by up to 20/15 mmHg by the time of waking or before (about 6 am) Leading up to this, the highest levels of blood pressure occur after 10 am with a peak around noon but often with a plateau extending to 6 pm. In the late evening and by the time on going to sleep there's a decline in pressure of 10-20%, with a nadir (dipping) in blood pressure at about 3 am. This pattern of variation is modified among individuals with hypertension and it can lead to life-threatening diseases.³

Objectives of the study:

The main aim of this report is to discuss the diurnal variation of blood pressure and different dipping patterns among hypertensive patients.

Discussion:

Hypertensive individuals can experience different patterns of blood pressure such as the loss of "nocturnal dipping" in which the decline in blood pressure at night is less than 10% compared with normotensive individuals, or some may experience exaggerated morning rise or "surge".³ According to a study based on 24-hour ambulatory measurement of systolic

blood pressure in hypertensive patients, four dipping categories were observed: extreme dippers, dippers, non-dippers, and reverse dippers.⁴ **Non-dippers** may not experience the nocturnal dipping almost at all, and this group of individuals have a high risk of developing cardiac problems.³ In contrast some hypertensive patients may be **extreme dippers** with reduction in pressure of more than 20% during nighttime.³ Reverse dippers show high incidence of cardiovascular events and mortality in comparison with dippers.⁴ Another 24-hour blood pressure measurement was applied on twenty-one elderly patients with essential hypertension revealed that: in all patients the office systolic pressures were significantly higher than the ambulatory daytime pressures, whereas the diastolic pressures were similar. At night two patterns of blood pressure were observed. In one both systolic and diastolic pressures fall to normotensive levels, while the other pattern showed no change in diastolic pressure, although the systolic pressure attained very high levels similar to the levels which was measured in the office. The prevalence of cardiovascular events in patients of the second pattern is higher than that in patients of the first pattern.⁵

Conclusion:

The diurnal variation of blood pressure among hypertensive individuals is modified from that of the normotensive individuals either by having a greater morning surge or different dipping patterns during night. And these variations are associated with increased risk of developing cardiac complications.

Recommendation:

Patients with hypertension should be aware of any factors that may affect their blood pressure levels because they are at high risk of developing cardiac complications that can be life-threatening.

References:

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