

The Influence of Consuming Two-Thirds of Daily Salt Intake at Dinner
on Variation of Circadian Rhythm of Blood Pressure and Urinary Variables.

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Summary

The aim of this study is to investigate whether there are variations in both blood pressure and urinary variables when we reappportion the percentage of total daily salt intake consumed at each of three regular meals. The study was conducted on seven clinically healthy normotensive female subjects who, in Stages LH and DH, consumed two-thirds of the normal daily salt intake (12g/day) at lunch-time or dinner-time, respectively. The total daily amounts of nutrients and dietary salt were similar in Stage-C (regulated salt intake), Stage-LH (a high salt intake at lunch-time) and Stage-DH (a high salt intake at dinner-time). A total of nine fractional urine specimens were collected over a 24 hour period: every 2 hours from 6:00 to 22:00 and 8 hours later at 6:00. The blood pressure response to the variation of sodium content in the meals was examined by means of non-invasive automated blood pressure monitoring (ABPM-630; reading every 15- or 30-min over 48 hours) and chronobiologic analysis. During Stage-DH, the urinary sodium acrophase occurred significantly earlier than during Stage-C and Stage-LH. Potassium and urine volume also occurred similarly early during Stage-DH as compared to the other two stages. The 24-hour mean level of blood pressure significantly increased when the prevailing salt intake was at lunch, and significantly decreased when the prevailing intake was at dinner. There was a significant correlation of the difference between urinary sodium circadian acrophase during Stage-LH and Stage-DH with the difference between systolic blood pressure acrophase during respective stages. These responses corroborate the view that the blood pressure susceptibility of human beings to salt intake varies during the day, showing its maximal expression at mid-day. Such a time-dependent sensitivity may be exploited for better nutritional prevention and treatment of arterial hypertension by reappportioning the salt intake so that two-thirds is consumed at dinner.