

MORNING SURGE ON 24-HOUR BLOOD PRESSURE MONITORING MORE PRONOUNCED IN MILD CHRONIC KIDNEY DISEASE

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Objectives:

Non-dipping effect is associated with chronic kidney disease, but little is known about the levels of the morning surge. The aim of our study was to determine the level of morning surge at 24 hour ambulatory blood pressure monitoring in chronic kidney disease and differences between groups with and without morning hypertension.

Methods:

Study group consisted of 72 hospitalized patients (38 males and 34 females), with chronic kidney disease (CKD), defined according to K-DOQI criteria. All patients had hypertension and 24 hour blood pressure monitoring was performed. Morning surge was defined as a difference between the hourly systolic blood pressure in the first two hours after waking and the mean systolic blood pressure that included the lowest blood pressure during sleep. Two groups were defined- a group with morning surge (MS+) where the difference was >55 mmHg and a group without morning surge (MS-), difference of 55 mm Hg or lower. The group with morning surge consisted of 12 patients (5 females and 7 males).

Results:

Patients from (MS+) group were significantly older than (MS-) group (58,3±9,5 vs 47,4±13,8, p=0,04). Target blood pressure was achieved only in 16% pts in (MS+) group and in 36% in (MS-) group. Neither the mean daily systolic blood pressure (153,8±24 vs 143±18 mm Hg, p=0,32), nor mean night systolic blood pressure (134±21 vs 133,7 ±26,8 mmHg) differed significantly in both groups. (MS+) group had preserved nightly dipping (13,4%±6,9% vs. 6,5%±2%, p=0,043) and non-dipping was present in 50% of patients in (MS+) group vs 75% in (MS-) group. Serum creatinine was significantly lower in MS+ group (162±96 μmol/l vs 247±93 μmol/l, p=0,009). Target organ damage (other than CKD) was less present in the (MS+) group (60 vs. 85%, chi-square test, p=0,003). (Table 1 and 2)

In a model of multiple logistic regression, when morning surge was used as a dependent variable, and presence of proteinuria, presence of dipping, gender, presence of left ventricular hypertrophy and target organ damage other than CKD, as independent variables, none of them were significant predictors of morning surge. (Table 3)

Groups/BP	MS+	MS-	Student's T-test/chi-square
Target BP achieved (%)	16%	36%	0,03*
Night dipping (%)	13,4%±6,9%	6,5%±2%	0,043*
DSBP (mmHg)	153,8±24	143±18	NS
NSBP (mmHg)	134±21	133,7 ±26,8	NS

Groups/BP	MS+	MS-	Student's T-test/chi-square
Age (yrs)	58,3±9,5	47,4±13,8	0,04*
Serum creatinine (micromol/l)	162 96	247 93	0,009 *
TOD	60 %	85 %	0,003 *

	B	Sig	Exp (B)
Proteinuria	-1,855	0,24	0,16
Gender	-0,9	0,55	0,4
LVH	1,9	0,19	6,9
TOD	-22,9	1	0,00
Constant	21,2	1	1615E

Conclusions:

Morning surge hypertension is more pronounced in milder forms of chronic kidney disease, while in more advanced disease, non-dipping pattern, but not morning surge hypertension, prevails.

References:

1. William B. White, MD. Importance of Blood Pressure Control Over a 24-Hour Period Supplement to Journal of Managed Care Pharmacy JMCP October 2007 Vol. 13, No. 8, S-b
2. White WB. Ambulatory blood-pressure monitoring in clinical practice. *N Engl J Med.* 2003;348:2377-78.
3. White WB. Relevance of blood pressure variation in the circadian onset of cardiovascular events. *J Hypertens.* 2003;21(suppl 16):S9-S15.
4. Mizuno M, Fukuda M, Miura T et al. Morning hypertension in chronic kidney disease is sustained type, but not surge type. *Blood Press Monit.* 2012 Feb;17(1):20-3

