

CLINICAL MEDICINE: EXPERIENCE AND INNOVATIONS

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EFFECT OF ALPHA-LIPOIC ACID COMBINED WITH ZINC SULFATE ON DAILY PROFILE OF BLOOD PRESSURE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS WHO HAVE HAD NON-Q-MYOCARDIAL INFARCTION

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Arterial hypertension (AH) is twice as frequent in patients with diabetes mellitus (DM) compared with those who do not have DM. Thus, two-thirds of patients with type 2 DM have AH. The major cause of mortality in diabetes is cardiovascular disease. The presence of AH in patients with DM worsens cardiovascular disease prognosis. In addition, masked AH and abnormal circadian blood pressure (BP) variability are common among patients with DM [1, p. 575–584, 2, p. 71–77, 3, p. 249–262]. Increase of BP in diabetic patients is caused by oxidative stress, endothelial dysfunction, insulin resistance, athero-inflammatory state. Despite the availability of multiple drugs effective for hypertension, BP targets are reached in only 50 % of patients, with even fewer individuals with type 2 DM-achieving goals. Since the efficiency of standard antihypertensive treatment under the condition of impaired glucose metabolism is lower, it is important to considerate the pathophysiology of AH in type 2 DM [4, p. 160, 5, p. 111–115]. Taking into consideration the above, it is of interest to investigate the possibilities of recognized antioxidants with additional pleiotropic effects – alpha lipoic acid (ALA) and zinc (Zn) sulfate.

Purpose: to investigate 24-hour ambulatory blood pressure monitoring (ABPM) data changes in patients with type 2 DM who have had non-Q-myocardial infarction (non-Q-MI) under the influence of alpha-lipoic acid (ALA) and zinc (Zn) sulfate.

Materials and methods: 49 patients were examined (mean age $60,97 \pm 1,59$ years) with type 2 DM who have had non-Q-MI. For the basic treatment of patients during 4 months it was added ALA 600mg/day and Zn sulphate 248mg/day. 24-hour ABPM with the evaluation of standard parameters using a portable automatic device «VAT41-2» (Ukraine) was performed before treatment and after its completion.

The significance of the differences in comparing mean values before and after treatment was determined using the Student's *t*-test (*p*). Value of $p < 0,05$ was considered to be significant.

Results and their discussion: The use of ALA and Zn sulfate for 4 months in patients with type 2 DM who had non-Q-MI, causes a decrease in SBP and DBP morning rise – MR ($p < 0,05$), mean daily and nighttime DBP variability ($p < 0,05$).

The character of changes of the main parameters of ABPM in the examined patients on the background of the applied treatment is presented in table.

In addition to the above changes, it is also recorded a positive downward trend in the level of mean daily and nighttime SBP ($p < 0,2$) and DBP ($p < 0,1$), the mean daytime DBP ($p < 0,2$), variability of the SBP in all the time intervals – $SBPV_{24-h}$ ($p < 0,1$), $SBPV_d$ ($p < 0,2$) and $SBPV_n$ ($p < 0,1$), and the daytime variability of DBP ($p < 0,2$). Furthermore, it was noted the decrease of the time load of DBP – $TI\ DBP_{24-h}$, $TI\ DBP_d$ and $TI\ DBP_n$ ($p < 0,2$). Dynamics in DBP parameters affected the degree of its night reduction, raising $DI\ DBP$ ($p < 0,2$).

Despite the fact that $DI\ SBP$ and $DI\ DBP$ in the treatment by ALA with Zn sulfate have not reached significant changes, under the influence of therapy there was a redistribution of patients by type of diurnal profile of SBP and DBP. Thus, by the value of $DI\ SBP$ before treatment 4 patients (8,2%) had normal levels of night decrease SBP – «dippers», 35 (71,4%) were characterized by lack of nocturnal decline of SBP – «non-dippers» and 10 patients (20,4%) with nocturnal hypertension were related to «night-peakers». After treatment it was observed an increase in «dippers» and «non-dippers» by 6,1% ($p > 0,2$) and the reduction of «night-peakers» by 12,2% ($p < 0,1$).

By the value of $DI\ DBP$ among patients before treatment «non-dippers» prevailed – 28 persons (57,1%), 12 patients (24,5%) belonged to the type «dippers», and 9 patients (18,4%) to «night-peakers». After applied treatment it was observed an increase in «dippers» by 12,2% ($p < 0,2$), reduction of «night-peakers» – 14,3% ($p < 0,05$), with almost unchanged number of «non-dippers».

Table

**ABPM parameters in the studied patients before
and after treatment (M±m)**

ABPM parameters		Studied patients (n=49)	
		1	2
Mean daily parameters	SBP, mm Hg	133,71±2,18	130,90±1,75
	SBPV, mm Hg	16,93±0,63	15,56±0,50
	TI SBP, %	47,62±4,57	42,61±4,38
	DI SBP, %	3,82±1,19	5,01±0,79
	MR SBP, mm Hg	52,6±2,77	44,20±3,14*
	DBP, mm Hg	79,76±1,64	76,26±1,42
	DBPV, mm Hg	13,96±0,52	12,42±0,46*
	TI DBP, %	30,03±4,44	23,65±4,49
	DI DBP, %	5,50±1,23	7,03±0,85
	MR DBP, mm Hg	46,28±3,01	37,00±2,79*
Mean daytime parameters	HR/min	70,19±1,53	69,01±1,53
	SBP, mm Hg	135,33±2,33	132,92±1,70
	SBPV, mm Hg	16,36±0,66	15,48±0,54
	TI SBP, %	37,32±5,13	33,15±4,11
	DBP, mm Hg	81,35±1,77	78,50±1,59
	DBPV, mm Hg	13,74±0,63	12,49±0,56
	TI DBP, %	27,72±4,80	20,91±4,32
Mean nighttime parameters	HR/min	72,45±1,64	71,02±1,72
	SBP, mm Hg	129,92±2,19	126,29±1,98
	SBPV, mm Hg	15,83±0,93	14,54±0,76
	TI SBP, %	65,59±5,52	59,75±6,05
	DBP, mm Hg	76,66±1,55	72,86±1,33
	DBPV, mm Hg	12,49±0,56	10,98±0,42*
	TI DBP, %	34,65±4,84	27,40±4,98
	HR/min	64,49±1,55	63,41±1,30

1 – before treatment, 2 – after 4 months of treatment; * – $p < 0,05$ compared with data before treatment.

Thus, according to the study, it is defined that 4-month application of ALA and Zn sulfate as an additional complex to basic treatment of patients with type 2 DM who had non-Q-MI, determines the decrease in MR SBP and MR DBP, mean daily and nighttime DBP variability and has a positive effect on diurnal profiles of SBP and DBP. The level and degree of loading by DBP at all time periods, the level of mean daily and nighttime SBP and its variability in our study had only a tendency to decrease.

Conclusion: The use of ALA and Zn sulfate for 4 months in patients with type 2 DM who had non-Q-MI, causes a decrease in BP morning rise,

daily and nighttime DBP variability and improves daily profiles of SBP and DBP.

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КЛІНІЧНИЙ ВИПАДОК СИНДРОМУ ЖИРОВОЇ ЕМБОЛІЇ

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Комунальне некомерційне підприємство «Вінницька центральна районна клінічна лікарня» Вінницької районної ради

м. Вінниця, Україна

Жирова емболія (ЖЕ) – це множинна оклюзія судин краплинами жиру, які найчастіше попадають в кров’яне русло при переломах тру-