Summary

THE USE OF PULSED MAGNETIC STIMULATION SYSTEM OF MEDICAL REHABILITATION OF PATIENTS WITH DEGENERATIVE DISORDERS OF THE SPINE IN RAILWAY EMPLOYEES

Loboiko V. V.

Offered us medical and rehabilitation complex using pulsed magnetic stimulation for the prevention and treatment of complications of destructive-degenerative disorders of the spine in patients with low back pain lumbar zone greatly increases the effectiveness sanogenetic mechanisms to improve trophic processes in the spinal segments, both in the area of formation of pathological disorders and in areas distal lower extremities.

The positive dynamics of functioning structures neyromorfolohichnyh spinal nerve under the influence of pulsed magnetic stimulation provides improved hemodynamic performance throughout the vascular bed in the lower extremities.

It was established that the basis sanogenetic improve the mechanisms of blood vessels, are processes that define their tone, elasticity and adequacy of response to treatment and rehabilitation influence factors.

High efficiency pulsed magnetic stimulation achieved by potentsiyuchoyi its effect on biological effects, which are formed in the body using standard treatments for osteoarthritis.

Keywords. *Transport medicine, osteochondrosis, diagnostic, preventions of complications, physiotherapy, impulse magnetic stimulation.*

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MODULATING EFFECTS OF BIOACTIVE WATER NAFTUSSYA FROM LAYERS TRUSKAVETS' AND POMYARKY ON SOME METABOLIC PARAMETERS

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Background. Previously we have been carry out comparative investigation **immediate** effects of Bioactive Water Naftussya from layers Truskavets', Pomyarky and Skhidnyts'a on neuro-endocrine-immune complex at men with its dysfunction. The aim of this study is the influence of the use of the **course** of Bioactive Water Naftussya from layers Truskavets' and Pomyarky on some metabolic parameters at similar patients. **Materials and methods.** The object of observation were 20 volunteers: ten women and ten men aged 33-76 years without clinical diagnose but with dysfunction of neuro-endocrine-immune complex and metabolism. In daily urine and venous blood we determined the content of electrolytes, nitrogenous metabolites and lipids. After examination volunteers within 7 days used bioactive water Naftussya (250 mL three times a day) from Truskavets' or Pomyarky layer, then repeated the tests listed. **Results.** Weekly use of Bioactive Water Naftussya increases in the normal level of plasma chloride and sodium, normalizes low level of bicarbonate and decreases within the normal levels of potassium and phosphate. Urinary excretion of sodium and chloride increases while excretion and concentration of uric acid decreases, as the urine concentration of

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phosphates. The index lithogenicity urine decreased from 112% to 103% norm standard. Initially reduced level of plasma triacylglycerides increases, while decreases in the normal level of cholesterol in low-density lipoprotein composition. No significant differences between the effects of Bioactive Water Naftussya both fields generally not found. **Conclusion.** Bioactive water Naftussya both Truskavets' and Pomyarky layers causes favorable normalizing effects on abnormalities parameters of metabolism, which is a manifestation of its adaptogenic properties.

Keywords: bioactive water Naftussya, electrolytes, nitrogenous metabolites, lipides.

Introduction

Previously we [13] have been carry out comparative investigation **immediate** effects of Bioactive Water Naftussya (BAWN) from layers Truskavets', Pomyarky and Skhidnyts'a on neuro-endocrine-immune complex. No significant differences between the effects of BAWN all fields generally not found. They causes approximately equal immediate effects on 29 parameters of neuro-endocrine-immune complex different from effects of Control (distillated, filtered, well) Waters.

The aim of this study is the influence of the use of the **course** of BAWN from layers Truskavets' and Pomyarky on some metabolic and biophysical parameters at similar patients. Previous post published as abstracts [12].

Material and research methods

The object of observation were 20 volunteers: ten women and ten men aged 33-76 years without clinical diagnose but with dysfunction of neuro-endocrine-immune complex and metabolism, characteristic for premorbid (intermediate between health and illness) state. Echoscopy kidney (echocamera "Radmir") stones not found. First volunteers collected daily urine, in which we determined the content of electrolytes and nitrogenous metabolites, and then on an empty stomach in the morning they took samples of venous blood for biochemical tests.

Among electrolytes estimated calcium (by the reaction with arsenazo III), magnesium (by the reaction with colgamite), phosphate (phosphate molibdate method), chloride (mercury rodanide method), sodium and potassium (flame photometry method) as well as bicarbonate (reverse titration method). Uric acid estimated by uricase method, creatinine by Popper's method as described in the handbook [3]. Also determined plasma concentration of triacylglycerides (metaperiodate-acetylacetone colorimetric method) and total cholesterol (direct method by reaction Zlatkis-Zach) as well as its distribution as part of lipoproteins high-density/б (applied enzymatic method G Hiller [4] after precipitation nonб-lipoproteins using dextransulfate/Mg^{2+}), very low-density/прев (calculated by level of triacylglycerides) and low-density/в (calculated by balance) as described in the handbook [3]. Use analyzers "Pointe-180" ("Scientific", USA), "Reflotron" ("Boehringer Mannheim", BRD) and flame spectrophotometer.

After examination volunteers within 7 days used Bioactive Water Naftussya (250 mL three times a day), then repeated the tests listed.

Normal values for surveyed contingent (including age and gender) were obtained from the database of Truskavets' Scientific School of Balneology.

Results processed using the software package "Statistica 5.5".

Results and discussion

No significant differences between the effects of BAWN from layers Truskavets'and Pomyarky generally not found. Because both groups for further

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analysis were combined.

For the purpose of adequate comparative assessment as an initial condition registered data and their changes as a result of the use of Bioactine Water Naftussya they are transformed into normalized parameters Id and Z, calculated by formulas [10]:

Id=V/M;

Z=(Id-1)/Cv; where

V is individual value indicator (variable);

M is its Mean Norm;

Cv is coefficient of variation in normal rate.

This approach allows us to estimate changes in indicators expressed in different units (мM/L, mM/L, mM/24h, units), firstly, on one scale, and secondly, in view of their "physiological cost" which determined by variability of indicators. For example, abnormal levels of calcium in plasma (Cv=0,065) 5% (Id=0,95)

approximately equally notable as the abnormality its urinary excretion (Cv=0,214) 18% (Id=0,82), as evidenced by roughly the same Z-scores: -0,80 and -0,85 respectively (Tables 1 and 2).

If we accept gradation by which the deviation from the average norm in a range of ±0,5 y are ignored, ±0,5ч1,0 y is slight and more than ±1,0 y is moderate, the following picture emerges.

The initial state surveyed continent as a whole is characterized by a moderate decrease in plasma levels of sodium and magnesium, and a slight decrease levels of chloride, calcium, phosphate, bicarbonate and uric acid, whereas creatinine level increased slightly (Table 1).

Regarding the urinary excretion may state moderate reduction of sodium, calcium, phosphates and slight decrease in magnesium, potassium and creatinine, whereas moderately increased excretion of urates (Table 2).

For plasma lipid spectrum is typical moderate decrease cholesterol as part of VLD LP, combined with a slight increase of its content as part of LD and HD LP (Table 3).

Fig. 1 illustrates both quantitative and qualitative effects of drinking BAWN. As you can see, the degree of reduction in plasma triacylglycerides and sodium excretion transformed from moderate to slight. Slightly reduced bicarbonate level quite normalized. Moderately reduced

Table 1

Effects of weekly consumption of bioactive water Naftussya on the blood levels of nitrogen metabolites and electrolytes

Variables	Statistic parame-ters	Baseline (20)	After drink course (20)	Change as direct differences (20)
Creatinine Mean Norm=68,5 µM/L Cv=0,208	V Id Z	78,2±1,7 1,14±0,02*** +0,68±0,12***	76,4±1,8 1,12±0,03*** +0,56±0,13***	-1,8±2,4 -0,03±0,03- 0,12±0,17
Uric Acid Mean Norm=340 M/L Cv=0,181	V Id Z	291±13 0,86±0,04** -0,73±0,21***	296±12 0,87±0,03*** -0,66±0,18***	+5±4 +0,01±0,01 +0,07±0,07
Calcium Mean Norm=2,30 mM/L Cv=0,065	V Id Z	2,21±0,05 0,96±0,02* -0,60±0,31*	2,18±0,03 0,95±0,01*** -0,80±0,19***	-0,03±0,02 -0,01±0,01 -0,20±0,16
Phosphate Mean Norm=1,20 mM/L Cv=0,167	V Id Z	1,10±0,05 0,91±0,04* -0,52±0,25*	1,05±0,04 0,87±0,03*** -0,77±0,17***	-0,05±0,02* -0,04±0,02* -0,25±0,12*
Magnesium Mean Norm=0,90 mM/L Cv=0,056	V Id Z	0,84±0,01 0,93±0,01*** -1,18±0,17***	0,84±0,01 0,93±0,01*** -1,23±0,16***	0,00±0,01 0,00±0,01 -0,05±0,18
Potassium Mean Norm=4,55 mM/L Cv=0,104	V Id Z	4,53±0,13 0,99±0,03 -0,05±0,27	4,43±0,11 0,97±0,02 -0,25±0,24	-0,09±0,02*** -0,02±0,01* -0,20±0,05***
Sodium Mean Norm=145,0 mM/L Cv=0,034	V Id Z	138,7±1,7 0,96±0,01*** -1,27±0,34***	147,7±1,6 1,02±0,01 +0,55±0,33	+9,0±1,9*** +0,06±0,01** +1,82±0,39***
Chloride Mean Norm=101,5 mM/L Cv=0,032	V Id Z	98,4±1,4 0,97±0,01* -0,95±0,42*	105,6±1,3 1,04±0,01*** +1,26±0,40***	+7,2±1,5*** +0,07±0,02** +2,21±0,47***
Bicarbonate Mean Norm=26,1 mM/L Cv=0,167	V Id Z	22,7±0,4 0,87±0,02*** -0,77±0,09***	24,5±0,3 0,94±0,01*** -0,37±0,07***	+1,8±0,4*** +0,07±0,02** +0,40±0,09***

Notes. p<0,05*; <0,01**; <0,001***

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Table 2

Effects of weekly consumption of bioactive water Naftussya on diurese and urinary excretion of nitrogen metabolites and electrolytes

Variables	Statistic parame-ters	Baseline (20)	After drink course (20)	Change as direct differen-ces (20)
Diurese Mean Norm=1,40 L/24 h Cv=0,274	V Id Z	1,36±0,14 0,97±0,10 -0,11±0,38	1,52±0,09 1,09±0,07 +0,32±0,25	+0,16±0,14 +0,12±0,10 +0,42±0,36
Creatinine Mean Norm=11,0 mM/24 h Cv=0,300	V Id Z	8,2±0,8 0,74±0,07*** -0,86±0,24***	9,2±0,9 0,84±0,08 -0,53±0,27	+1,1±1,0 +0,10±0,09 +0,33±0,29
Uric Acid Mean Norm=3,00 mM/24 h Cv=0,250	V Id Z	3,54±0,34 1,18±0,11 +0,72±0,45	2,94±0,24 0,98±0,08 -0,08±0,32	-0,60±0,40 -0,20±0,13 -0,79±0,54
Calcium Mean Norm=4,38 mM/24 h Cv=0,214	V Id Z	3,26±0,42 0,74±0,10* -1,20±0,45**	3,58±0,27 0,82±0,06** -0,85±0,29**	+0,33±0,49 +0,07±0,11 +0,35±0,53
Phosphate Mean Norm=25,2 mM/24 h Cv=0,294	V Id Z	15,4±2,3 0,61±0,09*** -1,32±0,32***	15,9±1,7 0,63±0,07*** -1,26±0,23***	+0,5±1,6 +0,02±0,07 +0,06±0,22
Magnesium Mean Norm=4,10 mM/24 h Cv=0,256	V Id Z	3,36±0,35 0,82±0,08* -0,70±0,33*	3,86±0,44 0,94±0,11 -0,23±0,42	+0,50±0,45 +0,12±0,11 +0,48±0,43
Potassium Mean Norm=65 mM/24 h Cv=0,269	V Id Z	53±6 0,82±0,09 -0,66±0,33	60±3 0,92±0,05 -0,29±0,20	+7±6 +0,10±0,09 +0,37±0,32
Sodium Mean Norm=225 mM/24 h Cv=0,211	V Id Z	162±17 0,72±0,07*** -1,33±0,35***	191±12 0,85±0,05** -0,71±0,25**	+29±19 +0,13±0,08 +0,62±0,39
Chloride Mean Norm=167,5 mM/24 h Cv=0,172	V Id Z	159±17 0,95±0,10 -0,30±0,57	198±15 1,18±0,08* +1,04±0,50*	+39±22 +0,23±0,13 +1,35±0,77

the use of BAWN causes the most pronounced effect on the exchange of chloride, sodium and uric acid. Despite the downward trend only urinary concentration uric acid and increased concentration of creatinine and magnesium urine lithogenicity index, calculated by formula: $(Ur \cdot Ca/Cr \cdot Mg)^{0,25}$, decreases from 0,82±0,04 to 0,76±0,02 (direct difference: -0,06±0,03*), to wit from 112% to 103% norm standard (0,73±0,04).

Our data, in principle, consistent with the long-known, obtained both in the clinic and in experiments on dogs and rats [1,5,6,7,11,14], but different from the recently published [9].

Conclusion

Weekly use of Bioactive Water Naftussya increases in the normal level of

level of plasma sodium transformed into a slightly elevated. On the other hand, slightly increased uric acid excretion is quite normal. Such balneoeffects we treat as normalizing, that is physiologically favorable. Reducing initially normal levels of potassium and cholesterol, both general and as part LDLP, is in the normal range, and the same level of plasma phosphate only slightly exceeds the lower limit. Such balneoeffects are physiologically neutral. Instead initially normal level of chloride excretion and moderately reduced level of chloride in the plasma increases to moderately elevated.

It is evident that

Table 3

Effects of weekly consumption of bioactive water Naftussya on the blood lipids

Variables	Statistic parame-ters	Baseline (20)	After drink course (20)	Change as direct differen-ces (20)
Triacylglycerides Mean Norm=1,47 mM/L Cv=0,250	V Id Z	0,96±0,11 0,66±0,08*** -1,35±0,32***	1,16±0,11 0,80±0,07** -0,82±0,29**	+0,20±0,11 +0,13±0,07 +0,53±0,30
Cholesterol total Mean Norm=5,39 mM/L Cv=0,184	V Id Z	5,55±0,22 1,03±0,04 +0,15±0,20	5,23±0,20 0,97±0,03 -0,17±0,18	-0,32±0,10** -0,06±0,02** -0,31±0,10**
VLD LP Cholesterol Mean Norm=0,68 Cv=0,250	V Id Z	0,44±0,05 0,66±0,08*** -1,35±0,32***	0,53±0,05 0,80±0,07** -0,82±0,29**	+0,09±0,05 +0,13±0,07 +0,53±0,30
LD LP Cholesterol Mean Norm=3,35 mM/L Cv=0,184	V Id Z	3,62±0,22 1,08±0,06 +0,41±0,33	3,27±0,17 0,98±0,05 -0,13±0,29	-0,35±0,13* -0,10±0,04* -0,54±0,21*
HD LP Cholesterol Mean Norm=1,36 mM/L Cv=0,179	V Id Z	1,49±0,11 1,11±0,09 +0,61±0,49	1,43±0,08 1,06±0,06 +0,32±0,36	-0,06±0,06 -0,05±0,05 -0,29±0,25

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plasma chloride and sodium, normalizes low level of bicarbonate and decreases within the normal levels of potassium and phosphate. Urinary excretion of sodium and chloride increases while excretion and concentration of uric acid decreases, as the urine concentration of phosphates. The index lithogenicity urine decreased from 112% to 103% norm standard. Initially reduced level of plasma triacylglycerides increases, while decreases in the normal level of cholesterol in low-density lipoprotein composition. No significant differences between the effects of Bioactive Water Naftussya both fields generally not found. Bioactive water Naftussya both Truskavets' and Pomyarky layers causes favorable normalizing effects on abnormalities parameters of metabolism, which is an additional manifestation of well-known its adaptogenic and sanogenic properties [2,7,10,11].

Fig. 1. Z-scores (Mean±SE) for parameters sensitive to the influence of bioactive water Naftussya

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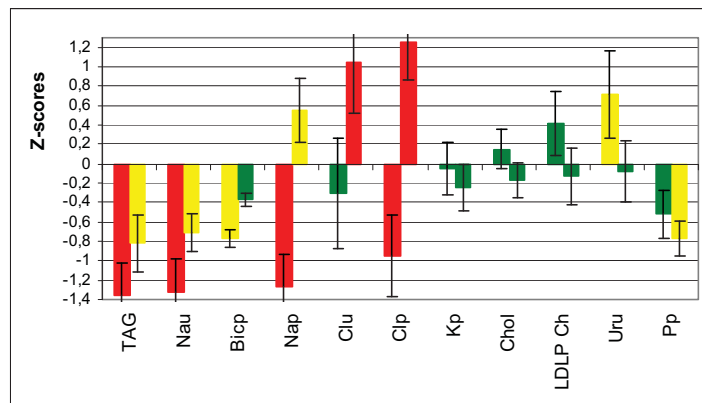
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Резюме

МОДУЛЮЮЧА ДІЯ БІОАКТИВНОЇ ВОДИ НАФТУСЯ ТРУСКАВЕЦЬКОГО І ПОМІРЕЦЬКОГО РОДОВИЩ

Гоженко А.І., Сидорук Н.О.

Тижневе вживання Нафтусі підвищує в межах норми рівень в плазмі хлориду і натрію, нормалізує знижений рівень бікарбонату та знижує в межах норми рівні калію і фосфату. Екскреція з сечею хлориду і натрію зростає, а сечової кислоти – знижується, при цьому знижується і її концентрація, як і концентрація фосфатів. Попри відсутність суттєвих змін концентрацій в сечі креатиніну, кальцію і магнію, розрахований на їх основі початково підвищений індекс літогенності сечі нормалізується, знижуючись від 0,82±0,04 до 0,76±0,02, тобто від 112% норми (0,73±0,04) до 103% норми.

Початково знижений рівень триацилгліцеридів підвищується від 66% норми до 80 % норми, натомість знижується в межах норми рівень холестерину в складі ліпопротеїнів низької густини.

Суттєвих відмінностей між ефектами Нафтусі обох родовищ в цілому не виявлено.

Ключові слова: *біологічно активна вода Нафтуся, електроліти, азотисті метаболіти, ліпіди.*

Резюме

МОДУЛИРУЮЩЕЕ ДЕЙСТВИЕ БИОАКТИВНОЙ ВОДЫ НАФТУСЯ ТРУСКАВЕЦКОГО И ПОМИРЕЦКОГО МЕСТОРОЖДЕНИЙ

Гоженко А.И., Сидорук Н.А.

Недельное применение Нафтуси повышает в пределах нормы уровень в плазме хлорида и натрия, а также нормализует сниженный уровень бикарбоната и снижает в пределах нормы уровни калия и фосфата. Экскреция с мочой хлорида и натрия возрастает, а мочевой кислоты - снижается, при этом снижается и ее концентрация, как и концентрация фосфатов. Несмотря на отсутствие существенных изменений концентраций в моче креатинина, кальция и магния, рассчитанный на их основе изначально повышенный индекс литогенности мочи нормализуется, снижаясь от 0,82 ± 0,04 до 0,76 ± 0,02, то есть от 112% нормы (0, 73 ± 0,04) до 103% нормы.

Изначально сниженный уровень триацилглицеридов повышается от 66% нормы до 80% нормы, зато снижается в пределах нормы уровень холестерина в составе липопротеинов низкой плотности.

Существенных различий между эффектами Нафтуси обоих месторождений в целом не выявлено.

Ключевые слова: *биологически активная вода Нафтуся, электролиты, азотистые метаболиты, липиды.*

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