Published in: Reflexotherapy – 2003. No. 4 (7) – pp. 41-45.

Authors: Tarakanov A.V., Grinberg I.Z., Milyutina N.P.
Department of emergency medical aid at the State Medical University – Rostov-on-Don, department of clinical tests ZAO "OKB RITM" (Taganrog), department of biochemistry and microbiology at State University – Rostov-on-Don.

Title: Universal mechanisms of SCENAR-effect in oxidative stress

Key words: SCENAR therapy, free-radical oxidation, early postinfarction angina, insomnia.

Annotation: The effectiveness of SCENAR is shown in comparison with complex therapy of postinfarction angina after small-focal myocardial infarction and monotherapy of chronic insomnia in emergency aid doctors. The sanogenetic effects achieved in both cases are conditioned by antiradical effect of SCENAR-therapy (limiting generation of active forms of oxygen). The anti-radical effect of SCENAR-therapy is universal for various pathological processes.

UNIVERSAL MECHANISMS OF SCENAR-EFFECT IN OXIDATIVE STRESS

SCENAR is a registered trade mark of ZAO OKB "RITM" (Taganrog), standing for the abbreviation of the name "**S**elf-**C**ontrolled **E**nergo-**N**euro **A**daptive **R**egulation". The medical technology of SCENAR is based on use of high-amplitude but harmless electrical impulses with automatic harmonization of their parameters to the functional condition of the body, changing in the process of the performed procedure. Many theoretical and practical aspects of SCENAR are analyzed in the "SCENAR-therapy and SCENAR expertise" digest which has been regularly published since 1995. Massive opportunities of its effective use in different areas of clinical medicine are shown there. Earlier published works allow us to suppose that some general, universal sanogenetic mechanisms establish the base of effective use of SCENAR in various diseases and pathological states.
Disorders in oxidative-antioxidative systems (oxidative stress) are involved in the pathogenesis of many diseases which are completely different in terms of pathophysiology and clinic.
Significant part is assigned to lipid peroxidation (LP) in the pathogenesis of ischemic or reperfusion damages of myocardium, as well as the atherogenesis and damage of atherosclerotic plaques on the background of decreasing anti-radical protection. Accumulation of primary and secondary products of LP causes membrane destruction, dissociates oxidative phosphorylation, and provokes paroxysm of coronary vessels [7]. Early postinfarction angina (EPIA) is one of the modern problems in cardiology. EPIA as a clinical syndrome is marked by occurrence of anginous attacks at rest or as a result of light load soon after acute myocardial infarction (6 hours to 4 weeks) [6; 10]. In the clinical practice, EPIA is regarded as one of the forms of instable angina due to its specific characteristics in its clinical presentation. EPIA worsens the prognosis in patients

with ischemic heart disease, especially in the period of 6 to 12 months, and the lethality can reach up to 50-57% [6].
The stabilization of clinical course is believed to be the main aim of the conservative therapy, especially when surgical treatment is impossible. This tactics includes prolonged supporting therapy as prophylaxis of repeated episodes of destabilization which can cause repeated infarction; it also includes prophylaxis of complications, and supporting patient's quality of life on a comparatively satisfactory level [6].
Because EPIA occurs in patients on the background of a performed treatment, and it is often refractory to the performed pharmaceutical therapy, new methods of treatment, including electroneurostimulation are discussed [11]. Research of Russian scientists in 1980s shows that transcutaneous transcranial stimulation causes manifested analgesia in patients with acute myocardial infarction [9]. Transcranial stimulation enhanced formation of postinfarction cicatrix in patients with acute myocardial infarction; it also improved the clinical course of the disease and decreased the signs of blood circulation deficiency, and decreased relapses of anginous pains [4]. Generalizing research found stress-inhibiting effect of reflexotherapy, as the anti-radical effect is a particular case of this action.

Special surveys made in different countries found that 28-45% of the population suffer from sleep disorders, as half of them require pharmaceutical corrections. According to statistical data, there are more than 7 million people in Russia (living in cities) who are not satisfied with their sleep [3]. Insomnia (or dissomnia) is the most often disorder, which is defined as a condition when the patients find it difficult to initiate and support their sleep, in combination with sleepiness during the day, weakness, and decrease of working capacity. Insomnia worsens patients' quality of life: work productivity decreases, professional growth slows down, attention concentration is damaged, and the risk of road traffic accidents increases [8]. One of the general reasons for insomnia is deprivation of sleep, connected with specific characteristics of the professional activity (work in shifts, night shifts). It is commonly acknowledged that employees of emergency aid teams work in conditions of permanent psychological and emotional tension, and even risk, 24 hours a day, as sometimes sleep is possible for 3-4 hours only. These can cause nervous and psychological disorders and chronic insomnia.

Sleep disorder is one of the indications to use methods of reflexotherapy, though we could not find evidence that oxidative-antioxidative system of blood plasma is involved in development of SCENAR therapeutic effects in patients with insomnia.

Objectives of the research
To study specific SCENAR-effects under general clinical criteria and the condition of oxidative-antioxidative systems of the body in patients with early postinfarction angina (EPIA) and insomnia, compared to conventional methods of treatment.

Aims of the research

1. To study the intensity of free-radical processes in EPIA patients' blood at sanatorium stage of treatment and rehabilitation after small-focal myocardial infarction (SFMI). To show the effectiveness and safety of the new method of combined treatment consisting of SCENAR impact on patient's cutaneous covering.
2. To perform comparative evaluation of the effectiveness of insomnia treatment in emergency aid doctors using conventional pharmaceutical drug Zopiklon (Imovan) and SCENAR. To study the impact of the performed therapy on changes of oxidative-antioxiadtive system of blood plasma.

Materials and methods

Patients with acute myocardial infarction were treated in the regional Cardiology Sanatorium in Rostov-on-Don. The rehabilitation actions were taken to eliminate complaints and symptoms (pharmaceutical therapy), restoration of physical capacity and psychological status, professional abilities of the patients and their ability to support independently their everyday routines.

Two groups of patients were formed using random sampling technique. The first group included patients after SFMI (n=11), whose treatment was performed with modern EPIA treatment approaches [6; 10]. The second group included 9 patients with SFMI and with 10 sessions of SCENAR therapy, added to pharmaceutical therapy, as the procedures were performed every 2^{nd} or 3^{rd} day of the stay at the Sanatorium.

The pharmaceutical therapy was unified as much as possible and included Aspirin (0.125 mg/day); selective b1-adrenoblocker without vasodilation properties: Atenolol – average daily dose of 31.2±3.3 mg or Metoprolol (Egiloc) with average daily dose of 34.9±5.3 mg; isosorbide mononitrate (monomac) with average daily dose of 44.2±2.0 mg. Inhibitor angiotensin was an obligatory drug - converting ferment – enalapril maleate (renitec), average daily dose of 5.6±1.2 mg.

The effectiveness of antianginal therapy was evaluated considering number of angina attacks, their duration and severity, and needs of sublingual taking of nitroglycerine, electro-cardiogram data, and exercise tolerance test.

132 doctors of mobile teams of emergency aid were questioned at the Department of Emergency Medical Aid at State University of Rostov-on-Don: (57 men and 75 women), and 90 doctors of other specializations who had not had night shifts by the moment of the survey (primary care physicians, pediatricians; 17 men and 73 women).

A protocol was developed for the purposes of the research, which included personal data, complaints, index of hemodynamics, concomitant diseases. The evaluation of sleep parameters was implemented with 5-degree scale and the following categories: time of falling asleep, duration of sleep, number of night awakenings, quality of the sleep, number of night dreams, and quality of morning awakening. If the total score is 22 and more, it shows normal sleep. A score of 19-21 points shows marginal disorders which do not require pharmaceutical corrections, a score of less than 19 points shows sleep disorder.

Emergency aid doctors with sleep disorders in the first group took sleeping medicine from the cyclopyrrolones group – Zopiklon (imovan), 7.5 mg, for 10

nights, 0.5 hours before bedtime. The second group had 10 sessions of SCENAR therapy every second day. The effectiveness of this treatment was evaluated on the base of repeated questioning. During the treatment the doctors did not have shifts.

Results

Table 1 shows that in SFMI the conventional treatment (group 1) reduces angina attacks with 45.5%, as the taken nitroglycerine pills decreased with 39.2%. Additional use of SCENAR shows more than doubled improvement. Nevertheless, comparison in relative values does not always show the real image of the process. Thus, in the first group only 27.3% of patients did not have painful fits after discharging from the Sanatorium. This index is 100% in the second group.

Let us have a look at dynamics of LP in patients with EPIA after SFMI. Table 2 shows that conventional treatment (1^{st} group) increases generation of active forms of oxygen (AFO) which is registered through method of chemical luminescence at luminol activation (Sm). This increase shows a larger generation of superoxide anion radical, and, which is more dangerous – hydroxyl radical.

Excessive generation of AFO in the first group intensifies PL of the plasma lipoprotein which is manifested by a reliable increase of levels of malonic aldehyde (MA). As an intermediate product, MA causes significant modification of protein amino acids, lipids and nucleic acids. Use of SCENAR in combined therapy inhibits the excessive generation of AFO. This has impact on PL products. In the second group reliable decrease of primary PL products was stated – diethenoid conjugate (DC) and unreliable decrease of secondary products (MA), and tertiary products – Schiff Bases (SB).

Thus, SCENAR-therapy in combined treatment of patients with EPIA after SFMI significantly increases antianginal effectiveness of the treatment, stabilizes the generation of active forms of oxygen and decreases PL intensity.

Data on clinical effectiveness of Imovan and SCENAR-therapy in insomnia patients are presented in Table 3.

Table 1
Comparative effectiveness of different methods f combined treatment in early postinfarction angina after small-focal myocardial infarction (M±m).

Indicator	1st group (conventional treatment)		2nd group (conventional treatment +SCENAR-therapy)	
Number of patients	11		9	
Average age, years	51.7±1.9		50.6±9.1	
Points of tests	Before treatment	After treatment	Before treatment	After treatment
Frequency of anginous fits per 24 hours	2.00±0.16	1.09±0.18***	1.56±0.17	0.11±0.10***
Number of nitroglycerine pills per 24 hours	2.55±0.24	1.55±0.16***	3.33±0.2	0.22±0.12**
Lack of fits, %	9.1	27.3	30	100*

Note: asterisks present the difference between the indicators before and after the treatment – reliable when: * - d< 0.05; ** - d < 0.01

Table 2
Intensity of PL and luminol – H_2O_2 – induced chemoluminescence (CL) of blood plasma in different methods of combined treatment in early postinfarction angina after small-focal myocardial infarction (M±m).

Indicator	n		DC	MA	SB	H, mm	Sm x 10^4 relative units
1st group (conventional treatment)	11	Before	27.64±1.84	34.35±2.08	1.74±0.19	54.91±3.04	70.73±4.48
		after	27.17±1.64	45.96±2.65***	1/62±1.14	70.73±3/56**	114.46±5.87***
2nd group (conventional treatment +SCENAR-therapy)	9	before	18.84±1.05	34.05±1.38	2.27±0.18	75.88±4.23	101.75±5.65
		After	14.99±1.65*	31.03±1.21	1.96±0.21	70.25±3.54	102.63±4.98

Note: asterisks present the difference between the indicators before and after the treatment – reliable when: * - d< 0.05; ** - d < 0.01; *** - d< 0.001

Table 3
Effectiveness of Imovan and SCENAR-therapy in treatment of insomnia

Therapeutic method	N	Quality of sleep (average total score)	
		Before treatment	After treatment
Imovan	17	16.8±2.4	23.7±1.2***
SCENAR-therapy	18	16.7±1.8	23.1±1.7 ***

Note: asterisks present the difference between the indicators before and after the treatment – reliable when: *** - d< 0.001

Among the questioned emergency aid doctors, 54 (41%) had normal sleep, 29 people (22%) had marginal state of sleep, and 49 (37%) had insomnia. The results of the survey made in doctors of other specializations defined that insomnia in this group is 20% less frequent than in the group of emergency aid doctors. After evaluation of the offered therapy it was stated that the treatment is equally effective in both groups. After Imovan and SCENAR-therapy the subjective evaluation of sleep increased with 41-38%, which responds to normal sleep, considering the average total score of 23.7 - 23.1. High results were stable in both groups a month after the treatment was finalized. Though, the treatment in different groups came with different value. Side effects after Imovan treatment – sleepiness in the morning and weakness were stated in 1% of patients, and 2% had complaints of a metal taste in the mouth. Side effects were not stated after SCENAR-therapy.

Evaluation data of oxidative-antioxidative systems are presented in table 4.

Intensity of PL and luminol – H_2O_2 – induced chemoluminescence (CL) of blood plasma at treatment of insomnia (M±m).

Indicator	n		DC Nmol/ml	MA Nmol/ml	SB	H, mm	Sm x 10^4
Imovan	17	Before	19.8±1.56	34.7±2.23	1.87±0.14	30.8±3.55	51.7±5.81
		after	20.4±1.26	34.6±2.98	2.02+0.15	55.4±3.26***	112.7±7.94***
SCENAR-therapy	18	before	21.2±1.22	41.7±1.34	2.59±0.12	28.7±3.63	62.1±4.71
		After	18.8±1.46	38.7±1.12	2.22±0.13*	29.4±2.15	63.2±4.32

Note: asterisks present the difference between the indicators before and after the treatment – reliable when: * - d< 0.05; *** - d< 0.001

The presented data shows that after Imovan treatment, generation of active forms of oxygen increases. Intensity of CL rapid flash (H, mm) increased with 79.8%, light sum of CL (Sm) increased with 118%, which shows high-level generation of superoxide anion radical and hydroxyl radical. Unreliable tendency of increase of primary, secondary and tertiary PL products is stated in this group.

Use of SCENAR in insomnia treatment had a stabilizing effect on the process of peroxidation. No further growth of AFO generation was stated. Decrease of PL products was registered, and the level of SB reliably decreased with 14.3%, which gives evidence of morphological and functional properties of blood plasma lipoproteins.

Discussion of the results and conclusion

Empirical observations showed afferent visceral reflection on the corporal surface as dots and accumulation of dots (theory of acupuncture dots system). They are linked into linear spatial complexes - channels. The dots and the channels are reflected “somatic homologues” of afferent systems of organs. We assist (directly and through CNS) the regulation of internal organs’ condition by affecting the somatic homologues through SCENAR. SCENAR processes biologically active dots, their accumulations and surrounding tissues (this is a zonal electrostimulator).

Proceeding from these premises comparing the specific SCENAR-effects, we intentionally selected two completely different processes in terms of physiopathology and pathobiochemistry. Using almost similar methods of SCENAR-therapy considering the principals of its implementation [5], we derived unidirectional effects: positive sanogenetic and anti-radical effect. Similar results were obtained in acute myocardial infarction, burn disease, bronchial asthma in adults and children. Use of SCENAR-therapy along with conventional therapy allows the body to mobilize its extra reserves, and of course, it is connected with regulatory and legal aspects of the matter, especially in EPIA patients. Use of SCENAR both in combined and monotherapy derives more significant clinical results and has unidirectional biological mechanisms of sanogenesis, consisting of oxidative stress inhibition.

Bibliography

1. Berkinbaev S.F. Postinfarction angina: clinical course and tactics of differentiated therapeutic approach: Dissertation abstract of Doctor of Medical Science – M., 1993 – p. 35.
2. Vasilenko A.Z. Acupuncture and reflexotherapy. Evolution of methodology and theory – Taganrog, 1998 – p.110.
3. Veyn A.M., Levin Y.I. – Insomnia// Clinical medicine – 1998 – No. 8 – p.52-55.
4. Golikov A.N., Pavlov V.A., Karev V.A. and others – Influence of transcranial electrostimulation of opioid systems on reparative processes in myocardial infarction patients. // Cardiology , 1989- No. 12, p.45.
5. Gorfinkel Y.V. Theoretical and practical bases of increased SCENAR-therapy// SCENAR-therapy and SCENAR-expertise: compilation of articles, No.2 – Taganrog, 1999 – pp.16-18.
6. Zimin Y.V. Early postinfarction angina// Cardiology – 1993, No.3 – pp.67-73.
7. Lankin V.Z., Tihaze A.K., Belyankov Y.N., - Free-radical processes in cardiovascular diseases// Cardiology – 2000 – No. 7 – pp.48-58
8. Levin Y.I., Kovorv G.V. Sleep disorders and pharmaceutical correction in pshychoneurological practice// Psychiatry and pshychopharmacotherapy – 2003 – No.3 – pp.116-119.
9. Mkrtchyan V.R., Estrin V.A., Central electro analgesia and impulsive electro anesthesia in treatment of complicated myocardial infarction// Complications of acute myocardial infarction – M; 1982 – pp.124-133.
10. Shumakov V.A., Sledzevskaya I.K., Atanasova N.V., Malinavskaya I.E. – Modern ideas of early postinfarction angina and treatment tactics// Medical care – 1997 – No.2 – pp. 15-19.
11. Jackson G., Treatment of refractory angina//Medicography – 1999 – No.2 – pp.107-112.

The article is provided with the assistance of:

RITM OKB ZAO
Petrovskaya 99,
Taganrog 347900
Russian Federation
www.scenar.com.ru

and

RITM Australia Pty Ltd
7 Belsham Road
Kariong NSW 2250
Australia
www.scenar.com.au

Translated from Russian to English Language by: Mrs. Veselina Petkovap August 2008, Mladost 329, Sofia 1712, Bulgariap http://syntagma.dir.bg