

PROCEEDINGS OF THE FOURTH INTERNATIONAL CONFERENCE

«VIBROACOUSTICS IN MEDICINE» - СПб.: Вита Нова,

2007. – 113 с.: ил.

ISBN 978- 5-93898-139-3

Military Medical Academy named after S.M. Kirov, St.Petersburg, Russia

Kovelenov Alexey Yurevich, Dr.Med Sci., senior lecturer

Research of the efficiency of vibroacoustic therapy method in prophylaxis of influenza and other ARD

Influenza and other acute respiratory diseases (ARD) are the most common infectious diseases of human organism. According to the Ministry of Health and Social Development of the Russian Federation data, ARD are the first in the structure of infectious pathologies and make 80-90 % of all infectious diseases.

Considering the ability of influenza to cause annual epidemics and pandemics all over the world, influenza can be called a problem of global value. During the epidemics period, about 5 -20% of the population get sick. During pandemic, when there is a sharp change in the properties of the virus, every second person gets sick. As a rule, new strains of influenza first appear in China and the South East Asia, and then rapidly spread worldwide.

Influenza causes huge economical damage. And this damage is for the human being (loss of working days, expenditures on medicine) as well as for the society. Direct and indirect losses during a seasonal flash of influenza may amount to 40 billion rubles that makes nearly about 75% of losses from all other infectious diseases.

In the Armed forces of the Russian Federation, ARD also leads among other infectious diseases causing an essential loss of working and combat ability of the staff.

Besides direct harm to human health, influenza can worsen other diseases, which results in special danger to people with the accompanying chronic pathology, decreasing the immunoresistance. High risk groups for influenza and other ARD include elder people, newborns, soldiers on call, clinical patients, etc.

Till today, prophylactic vaccinations for ARD still experience problems.. Firstly, current vaccines protect only from viruses of influenza while more than 150 types of microorganisms are capable of causing ARD. Secondly, the efficiency of influenza vaccines both national and foreign is a priori unstable due to continuous antigenic drift of the activator. Therefore, the results of vaccination for influenza considering cost-efficiency are far from being optimal.

Insufficient efficiency of vaccination determines a very high urgency of development of nonspecific methods of influenza prophylaxis and also the means aimed at prevention of its adverse consequences - complications, exacerbations of chronic diseases, lethality etc.

The given methodical recommendations were the results of clinical-epidemiological researches which were conducted in the department of infectious diseases (with the course of medical parasitology and trophic diseases) of the Military Medical Academy named after S.M.Kirov. The main task was the studying of the efficiency of vibroacoustic method for the prophylaxis of severe influenza and ARD, and also seasonal increase of these infections sick rate.

The researches conducted showed that the introduction of complex prophylactic and treatment measures during influenza and ARD i.e., the vibroacoustic method decreases sick rate for these infections during their seasonal increase, reduces sickness severity and amount of complications during the development of the disease.

The physiological mechanism of microvibration prophylactic influence on tissues and organs.

Microvibration, as a resource, is used by organism for performing many functions. The most essential is the participation of microvibration energy in the formation of pumping function of venous and lymphatic vessels. The presence of valves in the vessels transforms any mechanical fluctuations, whether it is the variable tone of the vessels or other microvibration, into forward movement of blood and lymph, forming microvibrating pumps. The essence of any disease is the accumulation of the damaged cells which is a serious problem and requires many resources. The fact of the accumulation of the damaged cells speaks for insufficient resources of utilization of active damaging factors. Accumulation of the damaged cells in different tissues is the initial cause of influenza. Since the utilization of high-molecular proteins and the rests of the dead cells occur through lymphatic vessels and microvibration is the only unique and irreplaceable energy allowing the provision of lymphatic flow from tissues, it is clear that the resources of microvibration mostly determine organism ability to maintain cleanliness of tissues and organs. The accumulation of dead functional cells in the organs leads to their functional worsening. Since all that is removed from the tissue finally enters the blood system and is processed by kidneys and liver, their limited functions may limit speed of blood purification (general utilization speed). Therefore, microvibration influence on kidneys and liver make the basics of the method of influenza prophylactic treatment.

Earlier researches made by department of infectious diseases of The Military Medical Academy showed that the vibroacoustic influence on liver and kidneys in the patient with chronic hepatitis B and C leads to an authentic increase in the serum concentration of interferon α and γ (several times increase) which is directly proportional to microvibration application duration. Using "Vitaфон-1K" device for treatment of patients with chronic viral hepatitis (without applying traditional antiviral therapy) helped to reach stable remission in almost 40% of the patients.

There are data on insufficiency of interferon formation in patients with influenza and other ARD during severe disease. Low reaction of blood cells in reply to interferon inductors activity is often noted in patients with ARD.

Thus, the ability of "Vitaфон" to intensify the metabolic processes in the main organs of utilization - kidneys and liver, and strengthen the production of biologically active substances can increase general resistance of organism to infections which decreases influenza and other ARD sick rate, and during the disease to ease it and increase efficiency of traditional therapy.

Results of the research

From November 2003 to March 2005, 376 men at the age of 15-17 working for one of St.-Petersburg organizations were under supervision. In the specified period, the prophylactic vaccination for influenza in the given group was not performed.

Survey and medical documents analyzed helped to select a group of people getting sick with ARD three or more times a year. This group consisted of 23 people.

The selected group (No 1) was examined for blood cells ability to synthesize interferon α and γ (IFN- α , IFN- γ). As inducers of IFN- α , B-myctogen prodigiosan was used and as inducers of IFN- γ , T-myctogen fetohemagglutinin (FHA). 22 people in comparative group (No 2) were getting sick once a year. The research was conducted according to the method described in [4]. The data obtained are presented in Table 1.

Table 1. Comparative parameters of induction of interferon synthesis (IFN- α and IFN- γ) in persons who are often and seldom sick with ARD

Groups	Concentration of IFN- α (ME/ml)		Concentration of IFN- γ (ME/ml)	
	spontaneous	inducible	spontan eous	inducible
Group No 1 (n = 23)	3.0 \pm 0.2	32.2 \pm 3.8	0.8 \pm 0.1	24.3 \pm 2.1
Group No 2 (n = 22)	3.2 \pm 0.3	68.4 \pm 5.6*	1.2 \pm 0.3	36.4 \pm 4.0*

*-distinctions are authentic with corresponding parameters of group No. 1 (p <0.05)

Presented data show that blood cells in persons often sick with ARD authentically react poorly to inducers of interferon synthesis. The parameters of induced concentration of IFN- α are more than twice and that of IFN- γ are 1.5 times less in group No.1 compared to group No.2.

It is most possible that the decreased ability of blood cells to synthesize interferon is one of the reasons of frequent ARD episodes in group No 1.

Considering the biological effects of microvibration, its ability to increase the frequency of intercellular contacts, thereby activating the immunocompetent cells and increasing their responsiveness, we researched influence of vibroacoustic therapy with "Vitafon" on inducibility of blood cells in persons often sick with ARD. Group No.1 was divided into two sub groups No.1a (11 people) and No.1b (12 people). People from group No.1b were treated with microvibration in accordance with developed application methods, and group No.1a was a comparative group. Blood sampling was made in 15 minutes after the last procedure in order to analyze interferon concentration. The data obtained are presented in Table 2.

Table 2. Influence of vibroacoustic action on the parameters of the induction of interferon synthesis (IFN- α and IFN- γ) in persons often sick with ARD

Groups	Concentration of IFN- α (ME/ml)		Concentration of IFN- γ (ME/ml)	
	spontaneous	Inducible	spontaneous	inducible
Group No 1a (n = 11)	2.8 \pm 0.2	33.5 \pm 3.6	0.6 \pm 0.1	22.2 \pm 2.5
Group No 1b (n = 12)	3.5 \pm 0.4	50.8 \pm 5.1*	0.8 \pm 0.2	30.5 \pm 3.8*

*-distinctions are authentic with the corresponding parameters of group No 1a (p <0.05)

The data presented in Table 2 demonstrate authentic stimulating influence of vibroacoustic procedures on the ability of blood cells to synthesize interferon in reply to inductors activity.

The data obtained served as substantiation for researches of prophylactic efficiency of microvibration in people often sick with ARD.

People from group No.1b were treated with vibroacoustics for the whole supervision period (November 2003 – March 2005) except for two summer months (July-August):

Table 3. The scheme of using "Vitaфон" for the prophylaxis of influenza and ARD sick rate (scheme No 1 – resource set)

Weeks	Days of week	No of procedures per day	The number of procedures per day/region, mode/time of effect (minutes)			
			1	2	3	4
			«M4»+«K» right Mode «2»	«M4»+«K» left. Mode «2»	«M4»+«K» right Mode «2»	«M4»+«K» left. Mode «2»
1	Saturday or Sunday	Four procedures with an interval of 70 \pm 10 minutes morning or evening	10	10	10	10
Same till the research end						

Table 4. The scheme of using "Vitaфон" for prophylaxis of influenza and ARD sick rate (scheme No 2 - supportive)

Weeks	Days of week	No of procedures per day	The number of procedures per day/region, mode/time of effect (minutes)

			1	2
			«M4»+«K» right Mode «2»	«M4»+«K» left. Mode «2»
1	Tuesday, Thursday	2 procedures: 3-4 hours before sleep and indirectly before sleep	5	5
2	Tuesday, Thursday		10	10
3	Tuesday, Thursday		15	15
Same till the research end				

These schemes show that vibroacoustic therapy applied to liver and kidneys. Organism homeostasis and immunity directly depend on the function of these two organs. They don't have any muscular fibers of their own and consequently are impoverished by microvibration even in healthy person, especially with inactive life style.

During the period of supervision, the cases of ARD, duration of treatment and number of complications in both subgroups of examined persons were recorded.

Data of sick rate for groups of supervised persons are presented in Table 5.

Table 5. Comparative parameters of ARD sick rate in persons who received and didn't receive vibroacoustic therapy

Groups	Average no. of cases of ARD during the period of supervision.
Group No 1a (therapy not applied)	4,5
Group No 1b (therapy applied)	1,4

Presented data show that average number of ARD cases in group of people received vibroacoustic therapy was 3.2 times less than for comparative group. During the period of supervision, 49 cases of ARD were registered in group No 1a, whereas in group No 1b only 17. Out of 66 cases of respiratory infections, 36 were registered in 2003-2004, 30 - in 2004-2005. Serologically deciphered were 43 cases from 66. In 2003-2004, influenza A (52.2 %), adenoviral infection (30.4 %) prevailed while in 2004-2005 this was influenza A and B (40.0 %), and parainfluenza (15.0 %). In compared groups, the number of deciphered nosological forms was approximately equal.

Thus, vibroacoustic therapy performed according to our methods leads to considerable decrease of influenza and ARD sick rate in people who often get sick. The index of prophylactic efficiency of the developed methods of using "Vitaфон" for the given category of people makes about 3.2.

If the disease was getting worse, patients were taken to hospital and vibriacoustic therapy discontinued, while traditional therapy was used, including antiviral drugs (rimantidine, arbidol),

symptomatic drugs (antigrippin), and inhalations. In case of complications (pneumonia, sinusitis), the patient would be moved to hospital. Duration of treatment, number of complications and total work-losses for comparative groups are presented in Table 6.

Table 6. Comparative parameters of the duration of treatment, number of complications and total work-losses for people who received and did not receive vibroacoustic therapy

Groups	No of cases of ARD with severe duration	Average bed-day	No of days of work loss
Group No 1a (therapy not applied)	5 (10.2%)	8.0 ± 1.1	392
Group No 1b (therapy applied)	1 (5.9%)	6.9 ± 0.8	117

As the Table shows, in group No.1a - out of 47 cases of ARD five had severe duration (10.2 %), whereas in group No.1b - out of 17, only one (5.9 %). In all the cases it was pneumonia.

The data presented in Table 6 show clear tendencies for reduction of number of complications and duration of treatment in group of patients who received vibroacoustic therapy. Total work loss in group of the patients who received vibroacoustic therapy was 3.35 times less.

Thus, the researches conducted have shown high prophylactic efficiency of vibroacoustic therapy with "Vitaфон" in patients often sick with acute respiratory diseases. The prophylactic schemes of using the device have reduced ARD sick rate by 3.2 times in the given category of persons and reduced the work loss caused by this infection by 3.35 times and substantially ease its duration.