

Shapovalova A. A., Babov K. D., Badiuk N. S. Mineral natural table waters as a component of sanatorium-resort children rehabilitation complexes in the remission of oncological diseases. *Journal of Education, Health and Sport*. 2017;7(10):277-282. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.1312595>
<http://ojs.ukw.edu.pl/index.php/johs/article/view/5663>

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part B item 1223 (26.01.2017).
1223 Journal of Education, Health and Sport eISSN 2391-8306 7

© The Authors 2017;

This article is published with open access at Licensee Open Journal Systems of Kazimierz Wielki University in Bydgoszcz, Poland

Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non Commercial License

(<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

This is an open access article licensed under the terms of the Creative Commons Attribution Non Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted, non commercial

use, distribution and reproduction in any medium, provided the work is properly cited.
The authors declare that there is no conflict of interests regarding the publication of this paper.
Received: 10.10.2017. Revised: 27.10.2017. Accepted: 30.10.2017.

MINERAL NATURAL TABLE WATERS AS A COMPONENT OF SANATORIUM- RESORT CHILDREN REHABILITATION COMPLEXES IN THE REMISSION OF ONCOLOGICAL DISEASES

A. A. Shapovalova, K. D. Babov, N. S. Badiuk

State Institution "Ukrainian Research Institute of Medical Rehabilitation and
Balneology of the Ministry of Health of Ukraine", Odessa, Ukraine
Ukrainian Research Institute of Transport Medicine of the Ministry of Health of
Ukraine, Odessa, Ukraine

Abstract

Urgency. High rates of oncological diseases (11.5-12.0 per 10.000 of children's population) dictate the need for comprehensive approaches to the organization of the rehabilitation process. **The objective:** to justify the advisability of using mineral natural table water in the period of oncopathology remission in children under conditions of sanatorium-and-spa rehabilitation. **Materials and methods.** The algorithm of the children's examination included the study of anamnesis, complaints, initial nonspecific adaptive-adaptation reactions (according to the general clinical analysis of blood). The general rehabilitation complex (GRC) included a dose-sparing motion regimen; climatotherapy, diet food, therapeutic exercises in special medical groups, singlet-oxygen cocktail, phytotea (holosas with ascorbic acid), psychological support. In addition to GRC in 2 therapeutic complexes (TC) mineral natural table waters (MW) *Truskavetskaya Akva-Eko* mineral water (TC1 after treatment of solid tumors) and *Morshinskaya* (TC2 after treatment of oncohematological diseases). **Results.** The general tendency to the mend of sick children state under the influence of TC1 was established in comparison with GRC. It manifested in significant changes of various

levels ($P < 0.05$, $P < 0.01$) of all symptom-complexes without exception. At the end of the rehabilitation course with the usy TC2, 50% of children reported a decrease of rapid fatigue, 30% decreased irritability, 27.7% improved appetite, and 22.2% decreased flatulence. Pain syndrome in the right upper quadrant disappeared in 16.7% of the children, and in 33.3% of the patients epigastric pain disappeared. LK1 caused a significant increase of children with adaptive training reactions and quiet activation, decrease in the reactions of increased activation; the disappearance of stress and excessive activation reactions. The use of TC2 facilitated a threefold decrease in the frequency of manifestations of the IV degree of stress of nonspecific adaptation reactions of low level, the disappearance of initial stress reactions in 33.3% of children, doubling the frequency of training reactions while maintaining the frequency of quiet activation reactions and the tendency to increase the reactions of increased activation. **Conclusion.** Additional in cycles assignment to the GRC MW *Truskavetskaya Akva-Eko* and *Morshinskaya* for the children after solid tumors and oncohematological diseases treatment allows to reliably reduce the manifestations of asthenic, pain and dyspeptic syndromes and to ensure the optimization of nonspecific adaptive reactions of the body.

Key words: mineral natural table water, reaction of adaptation, oncohematological disease, solid tumor.

Introduction. The problem of sanatorium-and-spa rehabilitation of children with malignant neoplasms is grounded in high rates of oncological diseases, which make up 11.5-12.0 per 10.000 of children's population and occupies the 7th place in the structure of children's disability. Polychemotherapy, radiation treatment of malignant neoplasms in children cause various disorders from the hepatobiliary system, gastrointestinal tract, bone, cardiovascular, endocrine, immune systems, psycho-emotional sphere. These violations require integrated approaches to the organization of the rehabilitation process [1, 2].

In our previous works the use of mineral waters (MW) in the rehabilitative treatment of children with oncohematological pathology has been substantiated [3, 4]. However, the use of mineral natural table waters (MNTW) for these purposes has not been studied to date.

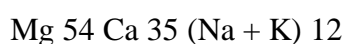
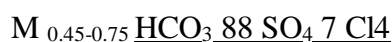
The objective: to justify the advisability of MNTW use in the remission of oncological processes in children under conditions of sanatorium - and - resort rehabilitation.

Materials and methods

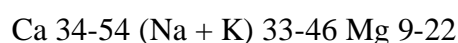
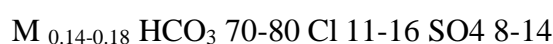
Anamnesis, complaints, initial nonspecific adaptive-adaptation reactions (according to the general clinical analysis of blood) [5, 6] have been examined in the children under observation.

The general rehabilitation complex (GRC) included a dose-sparing motion regimen; climatotherapy, diet food, therapeutic exercises in special medical groups, singlet-oxygen cocktail, phytotea (holosas with ascorbic acid), psychological support. In addition to GRC treatment complexes (TC) included drinking of MNTW:

- TC1 - 28 children after the treatment of solid tumors - with the administration of MNTW *Truskavetskaya Aqua-Eco* (bicarbonate-magnesium-calcium).



- TC2 - 30 children after the treatment of oncohematological diseases - with the administration of MNTW *Morshinskaya* (bicarbonate of various cationic composition).



MW were prescribed 3 - 4 times a day at the temperature of 30-35°C, at a dose of 3 mg / kg of body weight per administration, 30-40 minutes before a meal [7].

All the studies were conducted in accordance with the Council of Europe Convention “On the Protection of Human Rights and Human Dignity in Connection with the Application of Biology and Medicine Achievements”; Convention on human rights and biomedicine (ETS N 164), dated 04. 04. 1997 and Helsinki Declaration of the World medical association (2008). Parents of each child signed consent to participate in the study.

Results and its discussion

Significant changes in the manifestations of asthenic, pain and dyspepsia syndromes in children under the influence of GRC and TC1 were observed for all signs of these syndromes (Tables 1 -3).

Table 1.

Dynamics of manifestations of asthenic syndrome in children after treatment of solid tumors under the influence of TC1, (M ± m), scores

Asthenic syndrome	before the treatment	after the treatment	
		GRC	TC1
Increased fatigue, weakness	0.45 ± 0.07	0.35 ± 0.06	0.18 ± 0.02 *
Anxiety	0.33 ± 0.08	0.28 ± 0.05	0.12 ± 0.01 *
Vertigo	0.15 ± 0.04	0.11 ± 0.07	0.02 ± 0.01 **
Headache	0.51 ± 0.07	0.45 ± 0.04	0.09 ± 0.01 **
Irritability	0.59 ± 0.09	0.49 ± 0.08	0.19 ± 0.05 **
Emotional lability, depressed mood	0.26 ± 0.07	0.19 ± 0.03	0.09 ± 0.04 *

Note: * P <0.05; ** P <0.01.

The general tendency to the improvement of the sick children condition, which manifested itself in significant changes of different levels ($P < 0.05$; $P < 0.01$) of all symptom-complexes without exception should be noted. This was especially true of a significant ($P < 0.01$) reduction in dizziness, headache, irritability in asthenic syndrome; disappearance or significant ($P < 0.01$) pain reduction in the right hypochondrium and epigastric area; minimization of dyspeptic syndrome manifestations (worsening of appetite, bitterness, faintness, constipation, diarrhea).

Table 2.

Dynamics of pain syndrome manifestations in the children after the treatment of solid tumors under the influence of TC, ($M \pm m$), scores

Pain syndrome	before the treatment	after the treatment	
		GRC	TC1
Right hypochondrium	0.77 ± 0.13	0.68 ± 0.11	0.1 ± 0.03 *
Epigastrium	0.59 ± 0.08	0.45 ± 0.09	0.1 ± 0.03 *
Intestine	0.77 ± 0.13	0.1 ± 0.05	0

Note: * $P < 0.01$

Table 3.

Dynamics of dyspeptic syndrome in children after treatment of solid tumors under the influence of TC1, ($M \pm m$), scores

Dyspeptic syndrome	before the treatment	after the treatment	
		GRC	TC1
Impairment of appetite	0.42 ± 0.07	0.35 ± 0.05	0.1 ± 0.03 **
Bitterness	0.26 ± 0.06	0.21 ± 0.08	0.03 ± 0.002
Dullness	0.19 ± 0.06	0.12 ± 0.03	0.06 ± 0.03
Constipation	0.4 ± 0.09	0.3 ± 0.08	0.05 ± 0.009 **
Diarrhea	0.28 ± 0.04	0.28 ± 0.04	0.06 ± 0.002 **

Note: * $P < 0.05$; ** $P < 0.01$.

At the end of the rehabilitation course with TC2, 50% of children reported a decrease of rapid fatigue, 30% decreased irritability, 27.7% improved appetite, and 22.2% decreased flatulence. Pain syndrome in the right hypochondrium disappeared in 16.7% of the children, and in 33.3% of the patients epigastric pain disappeared.

The dynamics of non-specific body adaptation reactions under the TC1 influence (table 4) indicates that the supplementary administration of MW *Truskavetskaya Akva-Eco* causes a significant increase in the percentage of children with adaptation reactions of training

and quiet activation, a decrease in the reactions of increased activation; the disappearance of stress reactions and excessive activation.

Table 4.

Changes in non-specific body adaptation reactions after treatment of solid tumors under the influence of TC1, (%)

Period of study	Types of adaptation reactions, absolute number of patients, %				
	Stress	Training	quiet adaptation	increased activation	Undue activation
Before treatment	5(19.2)	4(15.4)	7(26.9)	6(23.1)	4(15.4)
After treatment	*0	12*(46.2)	14*(53.8)	3*(11.5)	0*

Note:* P> 0.01.

The use of TC2 complex contributed to a threefold decrease in the frequency of manifestations of the IV degree of nonspecific adaptation reactions of low level stress, the disappearance of the initial stress reactions in 33.3% of children, the doubling of the frequency of training reactions while maintaining the frequency of reactions of quiet activation and tendency to the increase of excessive adaptation reactions. In 44.4% of the children the index of humoral and cellular parts of the immune response ratio was improved after the treatment. The tendency to resolve the affector and effector links of the immune response, normalizing the ratio of specific and non-specific protection was revealed in 33.3% of children.

The results obtained are coordinated with the data of [4] and recommendations of [8], according to which the use of mineral (hydrocarbonate, chloride, sulfate) waters with mineralization up to 2 g / l without active specific components and connections or with a minimum of their content is proposed to achieve the most pronounced sparing effect in children with oncopathology.

MW internal intake affects the body both at the systemic and cellular level, which is manifested by activation of chemical, enzymatic, oxidation-reduction, physiological processes, normalization of the functional state of the nervous system, endocrine glands, restoration of the regulation of immunological reactivity, metabolism, reparation processes [9].

The use of MW can restore the functional state of the gastrointestinal tract, normalize the adaptive mechanisms, the activity of the nervous, endocrine and immune systems [4].

Conclusion

Additional course administration to the general rehabilitation complex mineral waters *Truskavetskaya Akva-Eko* and *Morshinskaya* for children after treatment of solid tumors and oncohematological diseases allows to reliably reduce the manifestations of asthenic, pain, dyspeptic syndromes and to ensure the optimization of nonspecific adaptive reactions of the body.

References:

1. Kuliev S. A., Kolygin B. A. Consequences of antitumor therapy in children /. - St. Petersburg: Hippocrates, 2011. - 184 p.
2. Poberskaya V. O., Yanchenko T. S., Yevseyeva S. L., et al. Comparative assessment of the rehabilitation of children with cancer in the outpatient and sanatorium-resort stages of rehabilitation / *Medical Rehabilitation, Resorts, Physiotherapy*. - 2010. - №1. - P. 3 - 7.
3. Panenko A. V., Belichenko T. A., Polshchakova T. V., Ivanitskaya E. A. Substantiation of the use of mineral waters in the rehabilitation treatment of children with oncohematological pathology // *Medico-Rehabilitation, Balneology, Physiotherapy*. - 2010. - №2. - P. 8 - 12.
4. Zolotareva T. A., Belichenko T. A., et al. To the question of the use of mineral waters in early rehabilitation treatment of children with oncohematological pathology / *Medicochna Reabulitacija, Balneology, Fizioterapiya*. - 2010. - №4. - P. 26 - 29.
5. Goryachkovsky A. M. *Clinical biochemistry in laboratory diagnostics: reference manual* / A. M. Goryachkovsky. - 2 nd Ed., Pererab. and supplemented. - Odessa: Ecology, 2005. - 616 p.
6. Tatkov O.V. *Adaptation issues in the practice of a spa doctor*. - Ivanovo: Printing. Equipment, 2006. - P. 247 - 267.
7. Babov K. D. (Ed.), Poberskaya V. O. *Rehabilitation of children with oncohematological diseases in sanatorium and resort conditions. Manual* /— Odessa: Optimum, 2010 - 160 p.
8. Moiseenko R. O., Poberskaya V. O., Bilichenko T. O., et al. *Organization of rehabilitation of children with oncohematological diseases in sanatoria of Ukraine: methodical recommendations* / – Kiev, 2009. - 22 p.
9. Babov K. D., Nikipelova E. M. *Mineral waters of Ukraine* / Spec. edition: UNESCO, 2005. - 210 p.