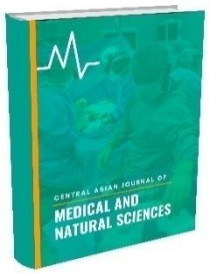
CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES



Volume: 04 Issue: 05 | Sep-Oct 2023 ISSN: 2660-4159

http://cajmns.centralasianstudies.org

Prospects for the Prevention of Micronutrient Insufficiency in Children with National Pharmaconutrient Products

1. **Rustamova Khabiba Khasanovna**
2. **Feruza Saidova**
3. **Rasulov Saydullo Kurbanovich**

Received 2nd Aug 2023,
Accepted 19th Aug 2023,
Online 26th Sep 2023

[1, 2] Scientific candidate, Samarkand State Medical University

[3] Scientific supervisor – MDc, Samarkand State Medical University

Abstract: The aim is to study the content of macro- and microelements in the composition of the national food product - grape shinny for the prevention and nutritional support of micronutrient deficiency in the Mother-child system.

Purpose - Development of new methods for early diagnosis, nutritional support using national food products with a high content of pharmacological nutrients (grape shinny) in the prevention of deficiency, macro- and microelements in the "Mother-child" system.

Results. The composition of grape shinny revealed a high concentration of calcium, potassium, zinc, iron, copper and in trace concentrations of abiogenic, toxic elements, which confirms the safety for humans.

Conclusions. Nutritional and micronutrient support using little-studied and little-used national food products: grape shinny, containing a high concentration of pharmacological nutrients, should be recommended in order to optimize the growth and development of children and the micronutrient status of the body and its functions, accelerate recovery processes and improve the quality of life.

Key words: micronutrients, microelements, “Mother-child”, deficiency, fruit and fruit products, grape tire, correction, prevention.

In the Samarkand region, the incidence of rickets in children under 1 year of life is 27.8%, frequent acute respiratory infections - 49.3%, insufficient stay in the fresh air less than 20 minutes a day - 38.6%, the time of birth of the child (autumn-winter period) - 32.4%, perinatal factors - 32.1%, anaemia - 25.5%, which play a significant role in the development of micronutrient deficiency[7.10].

The issues of clinical nutrition of nutritional support in the "Mother-Child" system include the problems of micronutrient insufficiency of pregnant and lactating women: anaemia, obesity, diabetes mellitus, cardiovascular risk, etc., in children - protein-energy insufficiency, rickets, anaemia, food

allergies and intolerances, often sick children, functional digestive disorders, etc. [2,3,4,6,9]. Based on the above data, the provision of medical and social assistance for the protection of mothers and children, taking into account the shortage of micronutrients, is as follows: a comprehensive assessment of the health status of mothers and children, from primary health care to specialised medical institutions, allows to solve not only medical problems, but also social, environmental and other problems with the subsequent development of preventive measures in target groups. Studies on the prevention of micronutrient deficiency and nutritional support with the help of national products containing macro- and micronutrients in the "Mother-Child" system have not been conducted in the conditions of Uzbekistan.

The purpose of the study. Study of the content of macro- and microelements in the composition of the national food product - grape shinni for the prevention and nutritional support of micronutrient deficiency in the "Mother-Child" system.

Material and research methods.

To prevent and correct the deficiency of micronutrients, the content of macro- and microelements in food products rarely used by the local population - grape shinni (patoka), was determined in the laboratory of activation analysis of the Institute of Nuclear Physics of the Academy of Sciences of the Republic of Uzbekistan with the neutron activation method. We studied only 23 different chemical elements included according to the classification of Bogatov A.V. (2004) in the group of macroelements (calcium, magnesium, potassium, sodium, chlorine), biogenic essential microelements (iron, copper, zinc, manganese, chromium, selenium, molybdenum, iodine, cobalt), conditionally essential trace elements (bromine, nickel, cadmium), brain elements (gold, silver) and abiogenic neutral (rubidium, scandium, lantasium), as well as abiogenic toxic or aggressive (mercury, antimony), the physiological role of which has not been sufficiently studied in the composition of products of natural plant origin - grape shinni.

The study of the sugar content in the grape shinni was carried out in the laboratory of the Khovrenko winery in Samarkand.

For safety for use by the population on the basis of the requirements of SanPIN grape shinni, studies were carried out: sanitary and bacteriological, radionuclide substances, pesticides and toxic elements in the laboratory of the sanitary and epidemiological service of the city of Samarkand. Sanitary and bacteriological study was carried out according to the requirements of SanPiN № 0366-19. Determination of radionuclide substances Cs-137, Sr-90 according to the requirements of SanPiN-0366-19 was carried out on the gamma beta spectrometer MKS-AT-1315 +20° C, 63% humidity. Toxic elements of STM and pesticide content were carried out at the request of SanPiN 0366-19.

According to laboratory analysis in the winery, the sugar content of grape shinni was 70%.

For the first time in the Zarafshan Valley region, we investigated the content of macro- and microelements of grape shinni rarely consumed by children and adults. For comparison, the standard content of trace elements in plants is taken[5].

In order to support and correct the deficiency of macronutrients, grape shinni was studied (Table. 1).

Table 1. Content of macroelements in grape shinny (µg/g)

Product	Ca	Na	Cl	Mg	K
Shinny (molasses) grape (n=3)	350-620	150	150	100	5800
Standard content in plants[5]	12000	1500	2000	1200	15000

From Table 1 it can be seen that the content of high concentration organic calcium salt contained in grape shinny (molasses) is 350-620 mcg/g. This product can be recommended as a prevention and correction of calcium deficiency for nursing women and children over 1 year of age (the use of grape shinny in children under 1 year of age is being studied) in the form of basic nutrition and complementary foods. If hypocalcemia is established, calcium supplements are prescribed along with food products.

The content of organic sodium and chlorine was found to be lower than standard samples - up to 150 µg/g. Grape shinny, as containing organic sodium and chlorine, is recommended for the prevention of sodium and chlorine deficiency in at-risk groups, as well as for loss of sodium and chlorine through vomiting in various digestive disorders and diseases. With established signs of hyponatremia, correction is carried out with sodium and chlorine preparations or ordinary table salt in the form of hypertonic solutions.

Potassium in the form of organic salt is moderately concentrated in grape shinny - 5800 mcg/g. Such a high-potassium product can be recommended to nursing women and children with established signs of hypokalemia for correction and nutritional support for preventive purposes.

The concentration of magnesium in grape shinny is lower than standard samples - 100 mcg/g. Grape shinny with a moderate magnesium content as nutritional support can be recommended for children over 1 year of age and nursing women at risk of magnesium deficiency for prevention and correction; with established hypomagnesemia, nutritional support including magnesium preparations.

From the group of essential microelements, we examined the content of cobalt, manganese, chromium, selenium, molybdenum and iodine grown in the Zarafshan Valley region as part of grape shinni (Table 2). (табл.2).

Table 2. Content of microelements in the composition of grape shinny (µg/g)

Element	Grape shinny (n=3)	Standard content in plants[5]
Co	0,07	0,1
Mn	3,4	300
Fe	78	160
Zn	177-960	40
Cu	6-15	10
Se	0,01	0,5
I	-	0,1
Cr	0,21	1,3
Mo	0,26	0,5
Br	0,47	6
Ni	0,5	1
Au	0,002-0,005	0,002
Ag	0,078	0,15
Hg	0,05	0,01
Sc	0,03	0,01
Rb	44	20
Sb	0,05	0,02
La	0,005	0,6

Table 2 shows that cobalt in a low concentration in the composition of vineyard shinni is 0.07 μg/g. Nutritional support from local flora products is an important part of prevention in the Mother-Child system from the cobalt deficiency risk group. With an established shortage of cobalt, drugs containing cobalt are recommended: vitamin B12 and its combined drugs (cobavit, picovit, complivit, duovit, oligovit, etc.).

From the products of the vineyard, the high iron content turned out to be grape shinni (78 μg/g). The physiological norm of iron for adults is 10 mg/day (for men) and 18 mg/day (for women), children's need for iron depending on age is from 4 to 18 mg/day. In plant products, all iron belongs to non-haemic, it is absorbed by no more than 10%. Vitamin C promotes the absorption of non-haemic gland. In case of iron deficiency in pregnant and lactating women and young children, nutritional support from local flora products containing high concentration of iron from fruit and fruit food products - grape shinni - is recommended. Preliminary studies have shown the high efficiency of grape shinni in anaemia of various genesis, scientific research is being conducted in this direction.

As part of fruit and fruit food products, the most rich in zinc were shinni from the vineyard - 960 μg/g, which is more than 20 times higher than standard samples. The daily requirement for zinc, depending on the age of children, is 3-12 mg. Based on the above data, we consider the most optimal and safest, anti-tricktion support for the prevention of zinc deficiency in the "Mother-Child" system with the help of foods rich in this trace element (shinni from the vineyard) It should be noted that children from 8 months of age instead of sugar and sugar-containing products recommend zinc-rich natural sweets used as national products - vineyard shinni.

To prevent conditions related to copper deficiency, it is important to know the content of this trace element in traditional food products of the population. Studies conducted in this direction have established that the copper content turned out to be high (from 50 to 100 μg/g) of the chinni of the vineyard The standard of copper in plants is 10 μg/g[5].

Manganese in the composition of grape shinni in low concentration - 3.4 μg/g, it can be recommended for the prevention of manganese and iron deficiency because manganese is a synergist of iron, and contributes to its absorption from the intestines.

Selenium, as an essential microelement in a low concentration, contains less than 0.1 μg/g. For preventive purposes, nutritional support of products containing selenium and therapeutic with selenium preparations for Keshan disease, with full parenteral nutrition, quashiorkor, phenylketonuria and "maple syrup odour disease" leads to normalisation of biochemical parameters and positive therapeutic effect. The obtained data [1] indicate a direct damaging effect of selenium on human tumour cells. Based on these concepts, long-term use of grape shinni in the diet can be useful in the prevention of tumour diseases.

There is no iodine in the grape shinni. All this gives grounds that Zarafshan Valley is considered a biogeochemical zone for iodine deficiency, which should be taken into account when carrying out preventive measures.

Low-concentration chromium in grape shinni - 0.21 μg/g. In the blood channel, chromium specifically binds to transferrin, which serves as a carrier not only of iron, but also of chromium. It is well studied that chromium is able to enhance the action of insulin in all metabolic processes regulated by this hormone. The need for chromium varies. within 50-200 μg per day. At the same time, the generally accepted diet contains 33-125 μg of chromium. Especially poor in chrome sugar-rafined and bread made of highly refined wheat flour (2.7 μmol/kg). If we take into account that sugar also increases the loss of chromium from the body, it is quite possible to assume that there is a significant insufficiency of this element in the "Mother-Child" system. Based on the data obtained, the introduction of grape

chinchny into the diet of a nursing mother and child reduces the risk of developing chromium deficiency.

Molybdenum in low concentration was detected in grape chinchny - 1.0 μg/g. The biological role of molybdenosis and molybdenum deficiency has not been studied.

Of the conditionally essential microelements, bromine and nickel in the composition of grape chinchny are lower than standard samples. Data in the literature on the functional role in the mother and child's body are not sufficiently covered, in this regard, nutritional support for deficient states requires further development.

Brain elements in the body are presumably involved in the conduction of brain impulses of mammals, the functional role in the body of children of these elements remains unexplored, perhaps they are involved in metabolic processes in the body. We have studied gold and silver from brain elements in food products. In the studied products, gold and silver are contained in very low concentrations and below standard samples - from 0.002 μg/g to 0.078 μg/g

Of the abiogenic elements, we have studied rubidium and scandium. Thus, rubidium in concentrations of up to 44 μg/g, contained in grape shinni. Due to the fact that rubidium of the highest concentration is contained in healthy foods, it can be considered closer to essential trace elements. Scandium in very low quantities exists in food products - up to 0.03 μg/g, it is obvious that it does not have a significant role. Abiogenic elements took their place in the metabolism of animals due to their weak reactivity, despite the wide prevalence in the lithosphere, participated in the metabolism of marine forms of organisms, which determined their further competition in the metabolism of terrestrial species (leading to pathology).

We have studied mercury from aggressive toxic elements in food composition. In the studied products, the mercury content ranges up to 0.05 μg/g. The clinical picture of methylmercury poisoning is the most studied. In the analysis of other abiogenic and toxic elements (antimony and lantasium) in the composition of grape shinni grown in the Zarafshan Valley region, very low values of the content of these elements (from 0.0005 μg/g to 0.005 μg/g) were revealed. This indicates a guarantee of the safety of this food product grown by us for mother and child.

Thus, in the study of macro- and microelements in the composition of grape shinni, high concentrations of calcium, potassium, zinc, iron, copper and in trace concentrations of abiogenic, toxic elements were revealed, which confirms the safety for humans. Nutritional support is an important part in the prevention of children with micronutrient deficiencies. It allows you to improve the quality of life, reduce the frequency of diseases, optimise the results of treatment.

1. Radionuelids, bacteriological studies, toxic substances and pesticides in the composition of grape shinni were studied to determine suitability for use according to SanPIN requirements. According to the results of the research, the sanitary and epidemiological laboratory gives the following conclusions:
2. According to the results of studies, radionuclides Cs-137, Sr-90 are within the recommended norm and fully meet the requirements of SanPiN No. 0366-19 No. 3 p. 44.
3. Conclusion SanPiN No. 0366-19: date of collection 01/08/2020. Grape shinny - total microbes MAFAM CFU 1.0 GOST 10444.15-94 -4.6x10\2 (norm - 5x10\3); BGKP GOST 31747-2012 - not identified; Pathogens: pathogenic flora, incl. Salmonella in 25.0 GOST 31659-2012 - not identified; Fungi CFU in 1.0 GOST 10444.2-2013 – not identified.
4. Grape shinny to comply with the requirements of SanPiN content of toxic elements, private labels, pesticides: SanPiN 0366-19 GOST 26929-94 GOST 26927-26130-26334-86 conclusion: Grape

shinny - meets the requirements of SanPiN 0366-19 (protocol No. 0211-12/ 03 1-2 2020 January 15).

Thus, nutritional and micronutrient support using little-studied and little-used national food products: grape shinny, containing high concentrations of micronutrients, should be recommended in order to optimize the growth and development of children and the micronutrient status of the body and its functions, accelerate recovery processes and improve the quality of life.

Literature:

1. Авцын А.П., Жаворонков Ф.Ф., Риш М.А., Строчкова Л.С. Микроэлементозы человека. Москва. 1991.
2. ВОЗ. Кормление и питание грудных детей и детей раннего возраста. //Методические рекомендации для Европейского региона ВОЗ с особым акцентом на республики бывшего Советского Союза. //ВОЗ. Европейская серия - 2001. Дания. – 369 с.
3. Игамбердиева П.К., Усманов Р.Д., Данилова Е.А. Исследование макро- и микроэлементного состава лекарственных растений южной Ферганы и перспективы применения их при лечении заболеваний. Фармацевтический журнал. 2015. № 3. С. 7−11.
4. Коденцова В.М. Вржесинская О.А. Рисник Д.В. Анализ отечественного и международного опыта использования обогащенных микроэлементами пищевых продуктов и йодирования соли. Микроэлементы в медицине. 2015 16(4): 3−20.
5. Кист А.А. Феноменология биогеохимии и бионеорганической химии. Ташкент. 1987.
6. Лашина Е.Л., Коляскина М.М.,Лягутина А.П.Клинический опыт применения специализированных пищевых продуктов в составе диетического питания при болезнях желудочно кишечного тракта. Материалы двадцать пятой Объединенной Российской Гастроэньерологической Недели. 7-9 октября 2019 г. Москва. С.70.
7. Расулов С.К., Бобомуратов Т.А., Джураева З.А. Медико-социальная охрана материнства и детства с учетом дефицита микронутриентов: нутриционная поддержка и профилактика. Lamdert akadeny Publishing 2022. Republic of Moldova Turope. Монография.198 с. www.morebooks.shop.
8. Сайдулло Расулов. Узум махсулотларининг шифолиги (ампелотерапия) ва микронутриентар. Тошкент. 2013. 136 б.
9. Хорошилов И.Е. Клиническое питание и нутриционная поддержка. Санкт-Петербург 2018.
10. Шарипов Р.Х., Расулова Н.А.. Взаимосвязь факторов риска риска развития рахита с уровнем 25(ОН)Д в сыворотке крови у детей. Журнал «Вестник врача» №1 Самарканд 2017 стр. 40-43