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Grape Shinny For Prevention And Nutritional Support Of Micronutrient Deficiency In Mothers And Children

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Abstract

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.To prevent and correct micronutrient deficiency, the content of macro - and microelements in food products rarely used by the local population - grape shinny (molasses), was determined in the laboratory of activation analysis of the Institute of Nuclear Physics of the Academy of Sciences of the Republic of Uzbekistan by neutron activation method. The study of the sugar content in the composition of grape shinni was conducted in the laboratory of the Khovrenko winery in Samarkand.In mothers and their infants, the high-risk group for micronutrient imbalance was the highest, 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.

Key words: micronutrients, trace elements, "Mother-child", deficiency, fruit and fruit products

1. INTRODUCTION

The health of mothers and children, including the fight against micronutrient insufficiency, is one of the primary tasks of health care in the Republic of Uzbekistan, as evidenced by the adoption in 2010 of the law of the Republic of Uzbekistan "on the prevention of micronutrient insufficiency among the population". The announcement of 2016 as the "Year of healthy mother and child" is also reflected in the resolution of the Cabinet of Ministers "on further improvement of implemented measures in the field of healthy nutrition of the population of the Republic of Uzbekistan" No. 102 dated 25.04. 2015, PCM No. 251 dated 29.08.2015 "on approval of the concept and set of measures to ensure healthy nutrition of the population of the Republic of Uzbekistan for the period 2015-2020", where it is indicated: "conducting research on issues of micronutrient deficiencies", "priority conduct fundamental research in the study of the reasons for the development of common diseases related to nutrition, study of the prevalence of micronutrient deficiencies, anemia, iodine deficiency, etc.," order MOH RUz № 352 from 2.09.2015, the order of the MOH of RUz №421 from 02.11.2015 city on the implementation of the above Pcrus.

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

The issues of clinical nutrition and nutritional support in the "Mother-child" system include problems of micronutrient insufficiency of pregnant and nursing women: anemia, obesity, diabetes mellitus, cardiovascular risk, etc., in children-protein and energy insufficiency, rickets, anemia, food allergies and intolerances, often ill children, functional digestive disorders, etc[1,2,3,4,5]. Based on the above data, the provision of medical and social assistance for the protection of motherhood and childhood, taking into account the lack of micronutrients, is as follows: comprehensive assessment of the health status of mothers and children, from primary health care to specialized medical institutions, allows us to solve not only medical problems, but also social, environmental and other problems, followed by the development of preventive measures in target groups.

2. MATERIAL AND METHODS

Early diagnosis of micronutrient deficiency was carried out by a comprehensive assessment of the state of health of the mother and child according to the algorithm developed by us, by filling out a questionnaire) 400 mothers and their children.

To prevent and correct micronutrient deficiency, the content of macro - and microelements in food products rarely used by the local population - grape shinny (molasses), was determined in the laboratory of activation analysis of the Institute of Nuclear Physics of the Academy of Sciences of the Republic of Uzbekistan by neutron activation method. Researched all 23 different chemical elements classification Bogatov A. V.(2004) in the group of the macronutrients (calcium, magnesium, potassium, sodium, chlorine), nutrient essential trace elements (iron, copper, zinc, manganese, chromium, selenium, molybdenum, iodine, cobalt),

conditionally essential microelements (bromine, Nickel, cadmium), brain-elements (gold, silver) and abiogenic neutral (rubidium, scandium, of lancisi) and abiogenic toxic or corrosive (mercury, antimony), the physiological role which has been insufficiently studied, in the composition of products of natural plant origin - grape shinny.

The study of the sugar content in the composition of grape shinni was conducted in the laboratory of the Khovrenko winery in Samarkand.

For safety to use by the population based on the requirements of the SanPiN grape shinni, studies were conducted: sanitary-bacteriological, radionuclide substances, pesticides and toxic elements in the laboratory of the sanitary-epidemiological service of the city of Samarkand. Sanitary and bacteriological research was carried out according to the requirements of SanPiN No. 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 ISS-at-1315 +20° C, 63% humidity. Toxic elements of STM and the content of pesticides were carried out at the request of SanPiN 0366-19.

Data on the composition and use of grape shinny in medicine are poorly covered in the literature. It should be noted that many people do not even know what shinny is, when, and how to use it, what are its useful properties and benefits, methods of application for nutritional and medicinal purposes. Since the development of refined sugar and up to the present time, mankind has become accustomed to the daily use of sugar and its derivatives. As a result, we get an artificial, chemically processed product that can cause a number of problems, especially in children, such as micronutrient deficiency, allergic diseases, lagging growth and development of children, anemia, decreased immunity, functional digestive disorders, predisposition to infections, frequent sick children, pathology of the endocrine, cardiovascular, hematopoietic and other systems[6,7].

3. RESULTS AND DISCUSSION

The results of our comprehensive assessment of maternal health showed that 67.9% of mothers suffered from anemia during pregnancy, 64.2% from toxicosis, 27.3% from threatened conditions, 25.5% from high blood pressure, 50.9% from inflammatory diseases, and 19.4% from chronic diseases.at the same time, 57.6% of pregnant women used various medications, and 61.2% of those who did not consume enough grain and legumes, low-consumption vegetables, fruits and greens - 60%, milk and dairy products-55.8%, meat and meat products-60.6%, fish products-75.6% women. Often using artificial (navat, sugar) sweets were-85.7%, tea-91-100% of mothers. 44.2% of mothers consider insufficient social security of the family, and 52.1% of mothers surveyed have low knowledge of caring for a healthy and sick child.

A comprehensive assessment of the health status of children showed: 21.8% of children were born with a low cry, early introduction of complementary foods to children - 37%, often ill - 35.8%, functional intestinal disorders - 35.7%, allergic rashes-25.5%, signs of rickets - 52%, cracks in the corners of the mouth - 31.5%, gratuitous screaming – 32.7%, flinching – 34.5%, convulsions - 4.8%, signs of anemia-13.9% of children. Violations of the rules of nutrition, care and tempering - from 40 to 50% of children. From the complex of children examined for micronutrient deficiency revealed: low risk group-57%, moderate risk group-35% and high risk group-8%.

Thus, mothers and their infants were at the highest risk of developing micronutrient imbalances, indicating that mothers lacked knowledge of nutrition, healthy lifestyles, proper child care, and poor medical culture, especially in rural areas. The questionnaire method of interviewing mother and child is an effective and simple method for assessing the state of health in the "Mother-child" system in primary health care. Based on the results obtained during the survey, it is possible not only to assess the state of health of the mother and child, but also to conduct a plan of preventive measures, as well as further health promotion of the younger generation.

It was found that nursing women and children from the early months of life use artificial refined sugar in the form of sugar syrup, granulated sugar and navvat, as well as as additives to food products. In order to replace artificial sugar with a natural sugar-containing pharmaconutrient product, we tried to study the macro-and microelement composition of grape shinny, since sugar and navvat do not contain macro - and microelements.

It should be noted that the grape shinny is grown by the authors themselves and is consumed daily as a natural food product as a nutritional support in exchange for artificial refined sugar for 30 years. The accumulated experience is proof of the benefits and safety of this product. Based on these considerations, we have conducted research on the composition of vineyard products (fresh and dried, gurob, Ovar from the vineyard, etc.), including grape shinny in order to develop recommendations for its wide use.

The sugar content of the grape shinny according to laboratory analysis in the winery was 70%.

For the first time, we studied the content of macro - and microelements rarely used by children and adults in the Zarafshan valley region. For comparison, the standard content of trace elements in plants is taken[8].

For the purpose of nutritional support and correction of macronutrient deficiency, grape shinny was studied(table 1).

Table 1

The content of macronutrients in grape shinnie (µg/g)

Product	Ca	Na	Cl	Mg	K
Shinny (molasses) grape (n-3)	350-620	150	150	100	5800
Standardcontentinplants [9]	12000	1500	2000	1200	15000

Table 1 shows that the content of high-concentration organic calcium salt is contained in the composition of grape shinny (molasses) - 350-620 mcg/g. This product can be recommended as a prevention and correction of calcium deficiency for nursing women and children older than 1 year (the use of grape shinny in children under 1 year is being studied) as a basic food

and as a complementary food. With established hypocalcemia, along with food, calcium preparations are prescribed.

The content of organic sodium and chlorine was found below the standard samples - up to 150 mcg/g. Grape shinny, as containing organic sodium and chlorine, is recommended for the prevention of sodium and chlorine deficiency from the risk group, as well as for the loss of sodium and chlorine with vomiting in various digestive disorders and diseases. With established signs of hyponatremia, correction is performed with sodium and chlorine preparations or ordinary table salt in the form of hypertonic solutions.

Potassium in the form of organic salt moderate concentration in the composition of grape shinny - 5800 mcg/g. This high-potassium product can be recommended for nursing women and children with established signs of hypokalemia for correction and nutritional support for preventive purposes.

In the composition of grape shinny, the concentration of magnesium is lower than the standard samples - 100 mcg/g. Grape shinny with moderate magnesium content as a nutritional support can be recommended for children older than 1 year and nursing women at risk of magnesium deficiency for prevention and correction, with established hypomagnesemia nutritional support with the inclusion of magnesium preparations.

We from the group of essential trace elements studied the content of cobalt, manganese, chromium, selenium, molybdenum and iodine grown in the Zarafshan valley region as part of the grape shinni (table 2).

Table 2

The content of trace elements in the composition of grape shinni (mcg/g)

Element	**Grapeshinny (n=3)**	**Standardcontentinplants[9]**
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 the low concentration of cobalt in the composition of the vineyard shinny is 0.07 micrograms/g. Nutritional support from local flora products is an important part of prevention in the "Mother-child" system with a risk group for cobalt deficiency. In case of established cobalt deficiency, preparations containing cobalt are recommended: vitamin B_{12} and its combined preparations (kobavit, picovit, Complivit, duovit, oligovit, etc.).

From the products of the vineyard, the high iron content was found to be grape shinny (78 mcg/g). The physiological norm of iron for adults is 10 mg/day (for men) and 18 mg/day (for women), the need for iron in children, depending on age, is from 4 to 18 mg/day. In plant products, all iron is non-heme, it is absorbed no more than 10%. Vitamin C promotes the absorption of non-heme iron. In case of iron deficiency in pregnant and nursing women and young children, nutritional support is recommended from local flora products containing high concentrations of iron from fruit and fruit foods-grape shinny. Preliminary studies have shown that grape shinny is highly effective for anemia of various origins, and scientific research is being conducted in this area.

In the composition of fruit and fruit food products, the most rich in zinc were chinnies from the vineyard – 960 mcg/g, which is more than 20 times higher than the standard samples. The daily requirement for zinc, depending on the age of children, is 3-12 mg. Nutritional support for zinc deficiency is carried out in non-medicinal ways – with the help of food products-grape shinny for healthy children, and-prescription of zinc medications for children at risk for micronutrient deficiency (it should be remembered that in order to prevent zinc deficiency in the body of children at risk, its content in the diet should be at least 15-20 mg/day).

Based on the above data, we consider it the most optimal and safe, nctrition support for the prevention of zinc deficiency in the Mother-child system with the help of food products rich in this trace element (chinnies from the vineyard) It should be noted that for children from 8 months of age, instead of sugar and sugar-containing products, we recommend zinc-rich natural sweets used as national products – chinnies of the vineyard.

To prevent conditions associated with copper deficiency, it is important to know the content of this trace element in traditional food products of the population. Studies conducted by us have found that the copper content was high (from 50 to 100 micrograms/g) of the vineyard shinny. The standard of copper in plants is 10 micrograms/g[5].

Manganese in the composition of grape shinny in a low concentration of 3.4 mcg/g, it can be recommended for the prevention of manganese and iron deficiency, because manganese is a synergist of iron, and promotes its absorption from the intestine.Samarkand medical institute Selenium, as an essential trace element in a low concentration contains less than 0.1 micrograms/g. For preventive purposes, nutritional support with products containing selenium and therapeutic with selenium preparations for Keshan disease, full parenteral nutrition, phenylketonuria and "maple syrup smell disease" leads to normalization of biochemical parameters and a positive therapeutic effect. The obtained data[1] indicate a direct damaging effect of selenium on human tumor cells. Based on these concepts, long-term use in the diet of grape shinny can be useful in the prevention of tumor diseases.

There is no iodine in the grape shinny. All this suggests that the 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 shinny – 0.21 mcg/g. In the bloodstream, chromium specifically binds to transferrin, which serves as a carrier of not only iron, but also chromium. It has been well studied that chromium can enhance the action of insulin in all metabolic processes regulated by this hormone. The need for chromium fluctuates. in the range of 50-200 mcg per day. At the same time, the generally accepted diet contains 33 -125 mcg of chromium. Refined sugar and bread made from highly refined wheat flour(2.7 mmol/kg) are particularly poor in chromium. If we consider that sugar also increases the loss of chromium from the body, then it is quite possible to assume that there is a significant deficiency of this element in the Mother-child system. Based on the data obtained, the introduction of grape shinny into the diet of a nursing mother and child reduces the risk of developing chromium deficiency.

Low concentrations of molybdenum were detected in grape shinny - 1.0 mcg/g. The biological role of molybdenum and molybdenum deficiency has not been studied.

From conditionally essential trace elements bromine and Nickel in the composition of grape shinny below the standard samples. Data in the literature on the functional role in the body of the mother and child are not sufficiently covered, in this regard, nutritional support for deficient conditions requires further development.

Brain elements in the body are presumably involved in the conduction of impulses in the mammalian brain, the functional role of these elements in the body of children remains unknown, perhaps they are involved in metabolic processes in the body. Of the brain items in the food composition, we studied the gold and silver. In the studied products, gold and silver are contained in very low concentrations and below standard samples - from 0.002 mcg/g to 0.078 mcg/g

We have studied rubidium and scandium from abiogenic elements. So, rubidium in a concentration of up to 44 mcg/g, is contained in the grape shinny. Since rubidium is found in the highest concentration in healthy foods, it can be considered closer to essential trace elements. Scandium is very low in quantity, existing in food products - up to 0.03 mcg/g, obviously, it does not have a significant role. Abiogenic elements took their place in the metabolism of animals due to their weak reactivity, despite their widespread occurrence in the lithosphere, they participated in the metabolism of marine forms of organisms, which determined their further competition in the metabolism of land species (leading to pathology).

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

Nutritional support for micronutrient deficiency is provided by non-medicinal methods – by using food products containing pharmaconutrients for healthy children, and-by prescribing medications containing macro-and microelements for children at risk with established micronutrient deficiencies.

4. CONCLUSIONS

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

To determine the suitability for use according to the requirements of SanPiN, radionuclides, bacteriological studies, toxic substances and pesticides in the composition of grape shinny were studied. Based on the results of research, the sanitary and epidemiological laboratory gives the following conclusions:

1. Grape shinny according to the results of research radionuclides Cs-137, Sr-90 within the recommended norm and fully meets the requirements of SanPiN No. 0366-19 No. 3 p. 44.
2. Conclusion of SanPiN No. 0366-19: date of capture 08.01.2020 Grape shinny-General microbes MAFAM CFU 1,0 GOST 10444,15-94 -4, 6X10\2 (norm-5x10\3); bgkp GOST 31747-2012-not identified; Pathogens pathogenic flora V. T. CH. Salmonella in 25,0 GOST 31659-2012-not identified; fungi CFU in 1,0 GOST 10444,2-2013-notidentified.
3. Grape shinny to meet the requirements of SanPiN content of toxic elements, STM, 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 shinni 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.

5. REFERENCES

[1] Khoroshilov I. E. Clinical nutrition and nutritional support. Saint Petersburg 2018.36-46 p

[2] Who. Feeding and nutrition of infants and young children. // Guidelines for the who European region with a particular focus on the republics of the former Soviet Union. //WHO. European series-2001. Denmark. - 369 p.

[3] Lashina E. L., Kolyaskina M. M.,Lyagutina A. P. Clinical experience in the use of specialized food products as part of dietary nutrition in diseases of the gastrointestinal tract. Materials of the twenty-fifth United Russian Gastroenterology Week. October 7-9, 2019 Moscow, 70 p.

[4] Igamberdieva P. K., Usmanov R. D., Danilova E. A. Research of macro-and microelement composition of medicinal plants of southern Ferghana and prospects of their application in the treatment of diseases. Pharmaceutical magazine. 2015. №. 3. 7 - 11 p.

[5] Kodentsova V. M. Vrzhesinskaya O. A. Risnik D. V. Analysis of domestic and international experience in the use of food products enriched with trace elements and salt iodization. Microelements in medicine. 2015 16(4): 3−20 p.

[6] Avtsyn A. P., Zhavoronkov F. F., Rish M. A., Strochkova L. S. human trace Elements. Moscow. 1991.421 p

[7] Sharipov R. H., Rasulova N. A. Correlation of risk factors for rickets development with level 25 (ON)D in the blood serum of children. The journal "Vestnik of the doctor" №1 in Samarkand 2017. 40-43 p.

[8] Kist A. A. Phenomenology of biogeochemistry and bioneorganic chemistry. Tashkent, 1987. 1189-1202 p.

[9] SaydulloRasulov. Uzummahsulotlari of chipology (ampelotherapy) VA micronutrients. Toshkent. 2013. 136 p.