Quantum Quest 2024

Materials Of CISM Students Scientific and Practical Conference

Republic of Kazakhstan, Almaty

March 27, 2024

УДК 614 (069)

ББК 51.1

П 71

ISBN 978-601-269-480-2

Preventive and clinical medicine: abstracts of the 2nd International Student Scientific and Practical Conference/ Caspian Public University, Caspian International School of Medicine; editorial board: Zh.K. Ismailov [and others]. – Almaty

The collection includes abstracts of reports of participants in the International Student Scientific and Practical Conference on the topic: “QUANTUM QUEST.” The theses highlight current problems of medicine and medical education. The topics cover research in the field of modern trends in the development of the theory and practice of medicine, problems and prospects for the development of healthcare, methodology and practice of the development of modern medical education through the eyes of students.

Conference Report: Quantum Quest 2024

The Caspian International School Of Medicine was abuzz with excitement as it hosted the prestigious “Quantum Quest” on March 27, 2024. This event, a cornerstone of scientific inquiry and student innovation, was meticulously organized by the Student Scientific Board in collaboration with BB partners, marking a significant milestone in the school’s history.

Quantum Quest opened with an inaugural ceremony that set the tone for the day’s intellectual pursuits. The event saw an overwhelming participation from students eager to showcase their research and findings in various scientific domains. The air was charged with anticipation and a collective spirit of discovery.

The competition was structured to challenge the brightest minds and foster a collaborative environment. Students presented their projects with poise and confidence, engaging with judges and peers in meaningful discourse. The presentations were not only a testament to their hard work but also reflected the high caliber of mentorship provided by their guides.

The first prize was awarded to Rashi Chandra, whose research stood out for its originality and potential impact. Under the expert guidance of Mirsaliyev Mirkhoshim and ELkendi Taufic, Rashi’s work shone brightly as a beacon of student excellence.

The second prize was claimed by a dynamic trio: Bee Bee Hajira, Kalakata Gnanasekhar Reddy, and Jangili Bharat. Their collaborative effort, nurtured by Ainur Yerlan’s mentorship, demonstrated the power of teamwork and collective intellect.

Securing the third prize was Toke Sharavani, whose dedication and perseverance under Tolegen Gauhar’s guidance were truly commendable. Sharavani’s project reflected a deep understanding of scientific principles and a strong commitment to research.

As the event unfolded, respected teachers and board members welcomed students, participants, and guests with open arms. Their presence underscored the supportive community at Caspian International School Of Medicine and their commitment to fostering academic excellence.

The closing ceremony was a heartfelt tribute to all those who contributed to Quantum Quest’s success. It celebrated not just the winners but every participant who dared to question, explore, and innovate.

In conclusion, Quantum Quest was more than just a competition; it was a celebration of young minds driven by curiosity and guided by knowledge. The event left an indelible mark on all attendees, inspiring them to continue their quest for scientific truth.

Congratulations once again to all winners and participants for pushing the boundaries of science and setting new benchmarks for future Quantum Quests.

CONTENT

RESEARCH OF FREEZE-DRIED CAMEL MILK «EXTRASHUBAT» AND THE POSSIBILITY OF ITS USE FOR THE TREATMENT AND PREVENTION OF TYPE 2 DIABETES MELLITUS

Gollapalli Sanjana

Consultant: Tolegen Gaukhar

Caspian International School Of Medicine

Camel milk is a natural product that has dietary and medicinal properties. Camel milk is also widely used in the field of alternative medicine. It has been scientifically proven that camel milk has the ability to help in the treatment of cancer and leukemia, due to the presence of substances that remove compounds from the body that provoke the development of cancer. In addition, such milk is used during the treatment of tuberculosis, ulcers and some other gastrointestinal problems. It is recommended to use this product for problems with the pancreas, liver and intestines, as well as diabetes mellitus.

Since ancient times, camel milk has been valued not only for its nutritional value, but also for its medicinal properties. Many authors have studied the microbiota of national lactic acid products, including shubat [1-9]. Scientists have also found that camel milk helps to stabilize diabetes mellitus, because it contains a high concentration of insulin. The therapeutic value of camel milk in the treatment of stomach ulcers and hepatitis was investigated by academician T.Sharmanov and collaborators [1]. Also, scientists [2] have successfully treated chronic enteritis and intestinal symbiosis using camel milk.

Camel milk is considered a rich source of protein – it contains lysozyme, lactoferrin, lactoperoxidase, immunoglobulins, as well as a protein that determines peptidoglycans, which was found only in camel milk [3]. It was also found that camel milk contains a low amount of β-casein and lacks β-lactoglobulin, so it can be consumed by people suffering from allergies to cow's milk [1-4]. The lactose of camel milk, compared with cow's milk, is easily metabolized, accordingly, it can be recommended to people with lactose intolerance [4].

The vitamin C content in camel milk is three times higher than in cow's milk and one and a half times higher than in mother's milk. In the authors' studies, camel milk was found to contain high levels of minerals such as sodium, potassium, iron, copper, zinc, selenium and magnesium [5]. According to the result of the authors, who studied the nutritional value of camel milk, the average protein content was 4.02± 0.1% and varying from 3±0.3% to 4.5± 0.2%. The main carbohydrate of milk is milk sugar – lactose, its amount in camel milk was 3.8 ± 0.1% and ranged from 3.3 ± 0.2% to 4.7±0.3%. The moisture content in camel milk varied from 87.5±0.8% to 91.6±0.6% with an average value of 89.5±0.4%. The average fat content in camel milk was 2.8±0.2% with changes in the range from 2±0.1% to 3.4±0.3% [6]. There is some information about the positive effect of camel milk and shubat in diabetes mellitus, that treatment with shalom leads to normalization of intracellular function of the pancreas, and the number of patients with a normal type of glycemic curves increases. In Kazakhstan, there were cases of a steady decrease in blood sugar in patients who consumed shubat at home. This issue is very important and interesting: the number of diabetic patients in the world is

increasing every year. It is necessary to comprehensively study the effect of camel milk and shubat on patients with diabetes mellitus in clinical settings.

Diabetes mellitus ranks third in the list of causes of death after cardiovascular and oncological diseases. About 1 million people worldwide suffer from this disease. In Africa, Asia and the Middle East, it is common practice for diabetics to self-medicate with camel milk. Studies have revealed that camel milk contains a high concentration of insulin – 150 U/ml, although insulin is present in women's, cow's and goat's milk, it is broken down in the acidic environment of the stomach. This does not happen with camel milk, which does not react to acid and in this case does not form coagulate.

The use of camel milk for ulcers, if we take into account that the common cause of ulcers is bacteria, then the bactericidal properties of camel milk will be effective. The complete healing of ulcers in 57.5% of patients after consuming camel milk is described in the works of a number of researchers. The protein that recognizes peptidoglycan (BRP) is related to heparin, which allows us to conclude about its role in the development of blood vessels (during wound healing) – this is important for the treatment of gastric and duodenal ulcers.

The synergistic effects of BRP, lactoperoxidase and lactoferrin slow down the growth of Gram-negative bacteria, for example, Helicobacter pylori, which cause ulcers. Lactoperoxidase remains resistant to pH acidity and protein breakdown, and therefore it is active in both the stomach and intestines. The connecting link is that the reason for the use of camel milk in the treatment of stomach cancer was the fact that after the treatment of stomach ulcers with antibiotics, remission of stomach cancer occurs [7].

Keywords: Camel milk, fur coat, diabetes mellitus

The object of research: The product of the company "BBPartners" LLP "ExtraShubat" freeze-dried camel milk.

The purpose of the study: To study freeze-dried camel milk "ExtraShubat" and the possibility of its use for the treatment and prevention of type 2 diabetes mellitus.

Milk contains both organic and inorganic substances. The first ones include proteins, fats, carbohydrates, vitamins, etc., and the inorganic ones include water and minerals. The chemical composition of camel milk in comparison with cow's milk [10-12] is presented in Table 1.

Table 1 – Chemical composition of camel and cow's milk

Name	Protein, %	lipids, %	Lactose, %	Sb, %	pH	Titratedacidity, ^{o}T

Camelmilk	4,18±0,02	3,92±0,08	3,53±0,04	12,35±0,04	6,35±0,05	18,2±0,05
Cow'smilk	3,36±0,05	4,45±0,05	4,6±0,05	12,41±0,05	6,4±0,05	16,5±0,05

According to Table 1, camel milk was characterized by a relatively higher protein content (4.18%) than cow's milk (3.36%). MJ was higher in cow's milk and amounted to 4.45%, while the fat content of camel milk was 3.92%. In terms of milk sugar content, camel milk showed a lower result (3.53%) than cow's milk (4.6%). The CB content in the samples was approximately the same. The indication of the active acidity of cow's and camel's milk showed an identical result (6.4 and 6.35, respectively). Also, the research results showed that the titrated acidity of cow's milk (16.5%) was slightly lower than in camel milk (18.2%). It should be noted that the chemical composition of both cow and camel milk also depends on many factors: breed, health status, feeding diet, animal welfare conditions, etc.

Clinical research methods:

Clinical observations (collection of complaints, examination)

General clinical blood tests and biochemical analysis with determination of glucose, cholesterol, LDL, HDL (Invitro Laboratory).

A survey of patients who participated in studies to identify and evaluate the antidiabetic effect of dry camel milk in patients with DM2.

In this study, patients with type 2 diabetes took 2 capsules of camel milk powder three times a day for 6 weeks, cow's milk powder served as a comparison of the therapeutic effect of the drug "ExtraShubat". Camel milk supplementation has been found to reduce fasting blood glucose levels, blood glucose levels 2 hours after meals, and serum total cholesterol. In the studies of the authors [15-16], there is also a significant increase in serum levels of osteocrine, amylin and GLP-1 in the camel milk group, which indicates an improvement in the condition of adipose tissue and skeletal muscles. The addition of camel milk powder significantly increases the relative content of Clostridium_sensu_stricto-1a and Eubacterium_eligens_group compared with cow's milk after 6 weeks of use. This study has shown that camel milk powder can be used as a functional food for the treatment of type 2 diabetes.

Diabetes is a common chronic disease and metabolic disease in which the body cannot effectively control glucose homeostasis. Diabetes can cause serious damage to the heart, eyes, kidneys, blood vessels, and nerves. Type 2 diabetes mellitus (DM2) is a widespread form classified by metabolic disorders with hyperglycemia and considered as a major health problem associated with higher morbidity and mortality. As a result, more and more research has focused on the development of antidiabetic drugs and functional foods, especially for the

treatment of DM2, which accounts for about 90% of diabetes, which can be prevented and cured with medication and a healthy lifestyle. Over the years, many types of traditional food therapy and natural remedies have been used to treat diabetes, however, the reliability and effectiveness of only some of them has been evaluated. In Africa, Asia and the Middle East, there is a traditional belief that regular consumption of camel milk can help in the prevention and control of diabetes, and epidemiological research has also shown a significantly lower incidence of diabetes in people who consume camel milk than in those who did not consume it. The hypoglycemic function of camel milk has been confirmed in rats with streptozotocin diabetes [13-20], characterized by a decrease in fasting glucose and glycosylated hemoglobin. Hydrolysates of insulin-like and whey proteins may be the main ingredients of the hypoglycemic action of camel milk. Insulin-like properties have been proven by reducing the need for insulin in patients with type 1 diabetes mellitus [13-18]. However, the question of whether these proteins can resist digestion by gastrointestinal proteases was still a matter of debate.

Another likely active ingredient with a hypoglycemic effect may be whey protein or its hydrolysate. It was also found that camel serum protein has an inhibitory effect on dipeptidyl peptidase IV [19], which control insulin secretion. It is also reported that camel whey protein hydrolysate has greater antioxidant and immunomodulatory activity than bovine and other serum proteins [19].

Thus, the aim of this study was to evaluate the antidiabetic effect of camel milk powder in patients with DM2. Considering that patients with DM2 have an increased cardiovascular risk and may develop complications such as diabetic foot, the protective effects of probiotic camel milk on the lipid profile in patients with DM2 were also evaluated.

We conducted a 6-week study to examine the effect of camel milk on type 2 diabetes. Patients with type 2 diabetes were recruited from medical clinics visiting hospitals. The inclusion criteria were the age of 35-68 years, the absence of diseases of the gastrointestinal tract and the willingness to refrain from consuming other milk, probiotic products and fermented dairy products during the study, but otherwise adhere to previous eating habits. The exclusion criteria were pregnancy or lactation in women, cancer, allergies or intolerance to camel or cow's milk. After the introductory phase, the participants were divided into two groups and received camel milk powder and cow's milk powder (control), respectively, for 6 consecutive weeks (three times a day, 2 capsules each time). All samples of camel milk powder were provided by BBPartners. The nutrient content of camel milk and cow's milk powder is given in Chapter 2 above. Blood glucose, serum lipid profile and sample collection were performed at the end of the introductory phase and at the end of the study. During the

study, participants were interviewed weekly about side effects, symptoms, or changes in quality of life.

References

- AbdAlmageed E.S.T.E. Properties of milk powder made from the milk of cow, goat and camel: a dissertation of M.Sc in Food Science and Technology / University of Khartoum. – Khartoum, 2009. – P. 1-3.
- Thomas M.E.C., Scher J., Desobry S. Milk powder ageing: effect on physical and functional properties // Critical Reviews in Food Science and Nutrition. – 2004. – Vol.44, № 5. – P. 297-322. 11 Wu H., Guang X., Al-Fageeh M.B. et al. Camelid genomes reveal evolution and adaptation to desert environments // Nature Communications. – 2014. – № 5. – P. 51-88.
- Gader A.G.M.A., Abdulqader A.A. The unique medicinal properties of camel products: A review of the scientific evidence // Journal of Taibah University Medical Sciences. – 2016. – Vol.11, № 2. – P. 98-103.
- Brezovečki A., Čagalj M., Dermit Z.F., Mikulec N., Ljoljić D.B., Neven A. Camel milk and milk products // Mljekarstvo. – 2015. – Vol.65, № 2. – P. 81-90.
- FAO stat. http://faostat3.fao.org. (20.03.2018.)
- FAO stat. Camel milk. www.fao.org/ag/againfo/themes/en/dairy/camel.html. (14.07.2019.)
- Farah Z., Mollet M., Younan M., Dahir R. Camel dairy in Somalia: limiting factors and development potential // Livestock Science. – 2007. – Vol.110, № 1-2. – P. 187-191. 123
- Khan B.B., Iqbal A. Production and composition of camel milk // Pak. Agri. Sci. – 2001. – Vol.38, № 3-4. – P. 64-68.
- Knoess K.H., Makjdum A.J., Rafig M., Hafeez M. Milk production potential of the dromedary with special reference to the province of Punjab // World Animal Rev. – 1986. – Vol.57. – P. 11-21. 19 Ismail M.D., AI-Mutairi S.E. Production parameters of Saudi camels under improved management system // In Proc. Int. Conf. Camel Production and Improvement. – Tobruk, Libya, 1990.
- Farah Z. Composition and characteristics of camel milk // 1 Dairy Res. – 1993. – Vol.60. – P. 603-626.
- Konuspayeva G., Faye B., Loiseau G. Variability of vitamin C content in camel milk from Kazakhstan // J. Camelid Sci. – 2011. – Vol.4. – P. 63-69.
- Singh M.B., Lakshminarayana J., Fotedar R. Nutritional status of adult population of Raika community in Jodhupur desert district of Rajasthan // J. Hum. Ecol. – 2009. – Vol.26, № 2. – P. 77-80.
- Shabo Y., Brazel R., Margoulis M., Yagil R. Camel's milk for food allergies in children // Immunol. Allerg. – 2005. – Vol.7. – P. 796-798.
- Hanna J. Over the hump. In: Jack Hanna's Animal Adventures // TV series (USA). – 2001.
- Konuspayeva G. Variabilité Physico-Chimique et Biochimque dulait des grands Camélidés (Camelus bactrianus, Camelus dromedaries et hybrids) au Kazakhstan: Thése Doctrat / University of Montpelleir. – France, 2007.
- Ahmed A.A.H., Sayed R.G., Sayed M. Nutritional value and sanitary evaluation of raw Camel's milk // Emir. J. Food Agric. – 2014. – Vol.26, № 4. – P. 317-326.

- Meiloud G.M., Bouraya I.N.O., Samb A., Houmeida A. Composition of Mauritanian camel milk: Results of First Study // Intern. J. Agric. Biol. – 2011. – Vol.13, № 1. – P. 145-147.
- Shuiep E.S., Elzubeir E.M., Ibtisam O.A., El-Owni O., Musa H.H. Influence of seasons and management on composition of raw camel (Camelus dromedaries) milk in Khartoum state // Sudan. Trop. Subtrop. Agro. Ecos. – 2008. – Vol.8. – P. 101-106. Faye B., Konuspayeva G., Messad S., Loiseau G. Discriminant milk components of bacterian camel (Camelus bacterianus), dromedary (Camelus dromedarius) and hybrid // Dairy Sci. Tech. – 2008. – Vol.88. – P. 6.
- Khaskheli M., Arain M.A., Chaudhry S., Soomro A.H., Qureshi T.A. Physico-chemical quality of camel milk // Journal of Agriculture & Social Sciences. – 2005. – Vol.1, № 2. – P.164-166.