

INFLUENCE OF CAMEL MILK COMPONENTS (*Ver-Mol-1 and Ver-Mol-2*) ON CANCER CELL CULTURE

Saitmuratova Oguljan Khudaiberganovna^{1,2}, Sagdiev Nail Zhadidovich¹, Zakirov Yorkin Uzuevich³

¹Institute of Bioorganic Chemistry named after acad. AS Sadykov AS RUz , Doctor of Biological Sciences, Leading Researcher, Associate Professor of the Department of Histology, Cytology and Immunology, TashPMI (Uzbekistan),

²Institute of Bioorganic Chemistry. Acad. AS Sadykova AN RUz , head of the laboratory of bioregulators, candidate of chemical sciences (Uzbekistan),

³Tashkent Pediatric Medical Institute, Doctor of Medical Sciences, Professor, Head of the Department of Histology, Cytology and Immunology TashPMI (Uzbekistan)

ABSTRACT

This work reflected in this article concerns the actions of Ver-Mol-1 and Ver-Mol-2 in different concentrations on different cultured cancer cells.

It has been established that Ver-Mol-1 and Ver-Mol-2 do not exhibit cytotoxic activity in regard to Hela cells (cervical cancer) at the implemented concentrations. AKAT cells (small intestine cancer) are more sensitive to the action of Ver-Mol-1 and Ver-Mol-2 (33-40%).

Keywords: Ver-Mol-1, Ver-Mol-2, substances, camel milk.

ARTICULATION OF ISSUE

Camel's milk has long been used in folk medicine for the treatment of a number of diseases.

The unique therapeutic properties of camel's milk are conditioned by the presence in it of such active natural ingredients as alpha-hydroxy acids, ascorbic acid, antioxidants, proteins and immune complexes, vitamin A, B vitamins, antibacterial agents [2,3].

Consumption of fresh camel milk helps to achieve better resistance to illnesses [4,5]. Scientists noted that lyophilized camel milk blocked the growth of cancer cells (BT-474-thorax)[6].

Likewise, the works of Arab scientists, highlight the inhibiting activity of camel milk on HepG2 (hepatoma) and MCF7 (breast cancer) cells in concentrations of 2.5, 5, 10 and 20 Mg/ml. It was shown that camel's milk causes apoptosis, increasing the activation of caspase-3 mRNA and the forms of activated oxygen [7].

In addition, the antitumor and immunomodulating activity were also found to be in camel's urine [8]. The Arab scientists have developed a substance derived from camel milk and urine, which according to them can successfully suppress cancer growth.

We also have been studying the biological activity of drugs isolated from camel milk and particularly, Ver-Mol-2, which possessed antiviral, interferon-inducing, anti-anememic, hypoglycemic features [9-11].

The objectives of the study include studying the effects of Ver-Mol-1 and Ver-Mol-2 on various cultured cancer cells.

MATERIALS AND METHODS

We studied samples of camel milk from the farming enterprises located in the Karakalpakstan region.

Cytotoxicity was assessed biochemically using the MTT method.

To determine the cytotoxic effect of the substances, B-16 cells (*skin cancer*), AKAT (*small cell carcinoma*) and Hela (*cervical cancer*) were placed on 96-well boards in the amount of 20-30 thousand cells/ml of 100 µl of RPMI 1640 medium with 10% calf embryo serum and were cultured at 37 ° C in a CO₂ incubator. After a day, proteins were administered in the form of 100, 10 and 1 µg/ml per 100 ml of the medium, the cells were cultivated for 24 hours and then MTT [3- (4,5-dimethylthiazol-2-yl) -2,5-diphenyl-2H-tetrazolium bromide] was added into cells to identify living cells. After one hour of incubation, the wells containing monolayer culture of B-16 cells were carefully drained of medium, then DMSO was added and incubation continued for 20 minutes and after it the optical density of the solution was measured at a wavelength of 620 nm.

RESULTS AND DISCUSSION

In this paper we studied the actions of Ver-Mol-1 and Ver-Mol-2 on three lines of cell cultures. The data are given in Tables 1 and 2.

TABLE 1

Cells. Doses, µg/ml	Suppression of inclusion MTT per cell,%			Growth Suppression Cells,%		
	B-16 (Skin cancer)	Hela (Cervical cancer)	AKAT (Cancer of the small intestine)	B-16 (Skin cancer)	Hela (Cervical cancer)	AKAT (Cancer of small intestine)
Control group	0%	0	0	0	0	0
100	18.2	0 (111)	33	17	0	30
10	0.7	0 (124)	11	1	0	10
1	0	0 (143)	11	0	0	9

* - the table reflects cytotoxic activity

Cells without exposure to substances were taken as control, where the level of MTT incorporation into cells equals to 100% (100% of living cells). Cisplatin was used by us as a positive control, indicating the sensitivity of cells to the effects of drugs. As can be seen from Tables 1, Ver-Mol-1 in the dose of 100 µg/ml inhibits the growth of B-16 cells by 18%, the growth of AKAT cells by 33%, and causes proliferation in the Hela cell culture. Cisplatin inhibits incorporation of MTT in B-16, AKAT and Hela cells by 98.5%, 84.5%, 44.4% at dose of 100, 10, and 1 µg/ml, respectively. Effects of Ver-Mol-2 on cell culture

TABLE 2

Cells Doses, µg/ml	Suppression of inclusion MTT per cell,%			Growth Suppression Cells,%		
	B-16 (Skin cancer)	Hela (Cervical cancer)	AKAT (Cancer of small intestine)	B-16 (Skin cancer)	Hela (Cervical cancer)	AKAT (Cancer of small intestine)
Control group	0	0	0	0	0	0
100	19	0 (141)	40	20	0	35
10	12	0 (131)	10	16	0	10
1	14	0 (121)	7	12	0	9

* - the table shows cytotoxic activity

As can be seen from Table 1, Ver-Mol-2 in doses of 100 µg/ml also inhibits the growth of B-16 cells by 19%, AKAT by 40%, and Hela cells grow under Ver-Mol-2 as well as with Ver-Mol-1. It can be said that AKAT-cells of small intestine cancer are more sensitive than other cell lines. Ver-Mol-2 suppresses cellular growth more than Ver-Mol-1 in general.

CONCLUSION

Preparations of Ver-Mol-1 and Ver-Mol-2 at concentration of 100 µg/ml, 10 µg/ml and 1 µg/ml do not exhibit cytotoxic activity against Hela cells. AKAT cells are more sensitive to the effects of Ver-Mol-1 and Ver-Mol-2.

REFERENCES

1. Sharmanov T.Sh. The healing properties of koumiss and shubat. 1991.
2. Narmuratova M.Kh., Konuspaeva G.S., Ivashchenko A.T, Loiseau J., Faye B., Serikbaeva A.D. Study of the physicochemical composition of camel's milk of the South Kazakhstan region // Bulletin of KazNU, Biology series. - Almaty, 2008. - No. 1 (36). - pages 176-178.
3. www.emirates.su/forum/threads/18-Verlovezhskaya-moloko .
4. <http://tonus.by/pitanie/milk/netradicionnye-vidymoloka> . Html
5. Baldandorzhiya Ts. Ts. Investigation of the chemical composition of milk of bactrian camel's milk. Transbaikal and the development of biotechnology of a fermented products: Dis. Cand. Tech. Sciences: 03.00.23 Ulan-Ude, 2005, P.154

6. Sidgi S.A. Hasson A. In Vitro Apoptosis Triggering in the BT-474 Human Breast Cancer Cell Line by Lyophilised Camel's Milk.// Asian Pacific Journal of Cancer Prevention, Vol 16, 2015
7. Hesham M. Korashy et al., Camel Milk Triggers Apoptotic Signaling Pathways in Human Hepatoma HepG2 and Breast Cancer MCF7 Cell Lines through Transcriptional Mechanism.// J Biomed Biotechnol .2012.
8. Nujoud Al-Yousef., Ameera Gaafar. Camel urine components display anti-cancer properties in vitro.// Journal of Ethnopharmacology. (2012), <http://dx.doi.org/10.1016/j.jep.2012.07.042>
9. Yakubova F.T., Saitmuratova O.H., Saytkulov A.M. A study of the antiviral activity of Ver-Mol-1 and Ver-Mol-2 based on camel milk. DAN RU. №4. 2011. P. 324.
10. Saitmuratova O.Kh., Yakubova FT, Sagdiev N.Zh., Saitkulov A.M. Study of interferon-inducing activity of Ver-Mol-2 in vitro in experimental animals. The Uzbek Biological Journal , P. 3-4, 2011.
11. Saitmuratova O.Kh., Suleymanova G.I., Kazantseva D.K., Sagdiev N.Zh. Anti-anemic properties of Ver-Mol -1,2 from natural camel milk. Republican Scientific Conference "Urgent problems of biology, ecology and soil science". Collection of abstracts. 2006., P. 111
12. Saitmuratova O.Kh. , Yakubova F.T., Sagdiev N.Zh. Hypoglycemic properties of Ver-Mol -2 Mat.scientific-practical conference "Urgent problems of physical-chemical biology dedicated to the 80th anniversary of acad. of AS of RUz Tashmuhamedov B.A. Apr. 14. 2015.