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CAMEL MILK; AN ADJUNCTIVE SUPERFOOD FOR DIABETES CASES

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ABSTRACT

Defects in insulin secretion by the pancreas and due to the cells may not respond properly to insulin, hyperglycemia or diabetes will be occurred and cause to the failure in the eyes, heart, kidneys and liver function. Nowadays, researchers looking for natural adjunct treatments to control diabetes. Camel milk is having anti-diabetic activity possibly because of insulin like protein (about 52 units/liter), that covered by fat micelles and can be an effective alternative for insulin to treat type 1 and 2 and gestational diabetes. It is proved that camel milk is safe and effective in improving long-term glycemic in the human patients and animal's models. In one study, daily consumption of 500 mL raw camel milk for 16 week in type 1 diabetic patients (average age 20 years) decreased daily insulin dose and blood sugar. Also raw camel milk in type 1 diabetic cases for 52 week and 3 months caused to significant reduction in HbA1c, mean blood glucose and 30% reduction in required insulin dose. Type 2 diabetics cases consumed 500 mL pasteurized camel milk for two months, that mean insulin concentration was significantly increased by the camel milk, but fasting blood sugar, lipid profile, blood pressure and insulin resistance did not influence. Therefore, according to the studies, raw camel milk in type 1 diabetes patients caused to increase insulin secretion, reduce required insulin and insulin resistance. Camel milk has immune-modulatory effects on the pancreas β-cells. Camel milk influences insulin secretion via the proper activity of the pancreatic cells and insulin receptors. Also this special milk improves diabetes complications such as dysfunction in the kidney and liver function and diabetic wounds. In general, although according to the clinical trials, the raw camel milk by 500 mL/day improved risk factors in diabetic patients. But it appears that more scientific studies are needed to confirm the effectiveness of processing's methods of camel milk on diabetes cases.

INTRODUCTION

There are various anti-diabetic drugs to treat diabetes but they have several negative effects on the patients' health (1). Although the proper treatment of diabetes includes insulin injection continuously to maintain blood glucose level, but nowadays, the researchers following some natural alternative healings for insulin. Camel milk contains insulin like proteins, which does not form coagulum in the acidic condition of stomach that may be an effective alternative for insulin (2). It is concluded that the incidence risk of diabetes in people who regularly consume camel milk, is much lower than those who don't use camel milk. Camel milk may prepare about 60% of the insulin in diabetic patients (3). Raw camel milk has immune-modulatory effects on beta-cells of the pancreas, increase insulin secretion, reduces required insulin and insulin resistance and improves the glycemic control in type 1 diabetes patients (4, 5). It is detected a high amount of insulin in the camel milk (about 52 U/L) that reduce blood sugar and required insulin dose about 30–35% in type 1 diabetes patients Camel milk improves the diabetes complications such as obesity, inflammation, wounds and oxidative stress damages (3).

The anti-diabetic properties of camel milk.

It is revealed that camel milk contains insulin like protein and amino acids sequence same with insulin and can be absorbed from the intestine without being destroyed in the stomach (3). The reason is presence of fat micelles in the camel milk that cover insulin and keep it safe in acidic environment of stomach, and transfer insulin to circulatory system in the diabetic patients (6).

Lactoferrin of camel milk has immune- modulatory effects on pancreas beta-cells and reduces required insulin doses in diabetes 1 and 2 patients (7). Obviously, camel milk effects on regulating of blood glucose are including; effect on insulin receptor function, signaling and glucose transport in the insulin-sensitive tissues, effect on the growth and activity of the pancreatic beta-cells in insulin secretion and negative modulation on the glucagon receptor (8).

Camel milk effect on the diabetes wounds and kidney and liver failures.

According to the recent studies, camel milk whey proteins or derived peptide improved wounds healing in diabetic cases. The anti-oxidative activity of camel milk whey proteins enhances the proliferation of immune cells and accelerates the wound healing process during diabetes. The camel milk can normalize renal and liver failures in the diabetic patients (9). Hypoglycemia effects of camel milk improved kidney and liver function in nephropathy; proteinuria and cardiovascular challenge as major complications in type 1 and 2 diabetes mellitus (10).

Some documented evidences on diabetic's cases recovered by camel milk.

Daily consumption of 500 mL raw camel milk for 16 week in type 1 diabetic patients (average age 20 years) decreased daily insulin dose and blood sugar (2). Also raw camel milk in type 1 diabetic cases for 52 week and 3 months caused to significant reduction in HbA1c, mean blood glucose and 30% reduction in required insulin dose (11, 12).

Type 2 diabetics cases consumed 500 mL pasteurized camel milk for two months, that mean insulin concentration was significantly increased by the camel milk, but fasting blood sugar, lipid profile, blood pressure and insulin resistance did not influence (9). (13) reported using of camel milk compared with cow milk in type 2 diabetic patients for 2 months showed significant increase in serum insulin concentration, and decreased in blood glucose and the required insulin dose.

One study on 50 type 1 diabetic patients clearly indicated that camel milk mixed with insulin was an adjunctive therapy in management of type 1 diabetes and the daily doses of insulin may be reduced by 66% after 12 week (13). Fermented camel milk significantly reduced fasting blood sugar, postprandial glucose, HbA1c, and HOMA-IR in type 2 diabetes patients but hypoglycemic effects on glucose tolerant was not detected (14).

How to use camel milk for diabetic cases.

Raw camel milk consumption for treatment is more common and beneficial and heating may destroy its therapeutic efficacy (15). But without heating, storage at high temperature with low hygiene conditions may spoil camel milk (16).

Pasteurizing in high temperature, boiling, cooling, freezing and freeze drying of camel milk may be leads to decrease the insulin concentration, and the efficiency of camel milk in control of blood glucose level and diabetes will be decreased (17). Hence, caring about temperature for processing of camel milk is very important to save therapeutic properties of camel milk.

REFERENCES

1-Rathmann, W.; Giani, G. (2004). Global Prevalence of Diabetes: Estimates for the Year 2000 and Projections for 2030: Response to Wild et al. Diabetes Care. 27(10): 2568–2569.

2-Mohamad, R.H.; Zekry, Z.K.; Al-Mehdar, H.A.; Salama, O.; El-Shaieb, S.E.; El-Basmy, A.A.; et al. (2009). Camel milk as an adjuvant therapy for the treatment of type 1 diabetes: verification of a traditional ethnomedical practice. J Med Food. 12(2):461–5.

3-Shori, A.B. (2015). Camel milk as a potential therapy for controlling diabetes and its complications: a review of in vivo studies. J Food Drug Anal. 23:609–18.

4- Agrawal, P.P.; Swami, S.C.; Beniwal, R.; Kochar, D.K.; Sahani, M.S. and Tuteja, F.C. (2003). Effect of camel milk on glycemic control, risk factors and diabetes quality of life in type-1 diabetes: A randomized prospective controlled study. J Camel Pract Res.10(1):45–50.

5-Aqiba, A.I.; Kulyar Muhammad, F.A.; Ashfaq, K.h.; Bhutta ZAhmad, Shoaib M.; Ahmed, R. (2019). Camel milk insuline: Pathophysiological and molecular repository. 88: 497–504.

6-Shamsia, S.M. (2009). Nutritional and therapeutic properties of camel and human milks. Int.J. Genet. Mol. Biol., 1:52–8.

7-Moreno-Navarrete, J.M.; Ortega, F.J.; Bassols, J.; et al. (2009). Decreased circulating lactoferrin in insulin resistance and altered glucose tolerance as a possible marker of neutrophil dysfunction in type 2 diabetes. J Clin Endocrinol Metab. 94:4036–44.

8- Ayoub, M.A.; Palakkott, A.R.; Ashraf, A. and Iratni, R. (2018). The molecular basis of the anti-diabetic properties of camel milk. Diabetes Res Clinic Prac.146: 305–312.

9- Ebaid, H.; Abdel-Salam, B.; Hassan, I.; Al-Tamimi, J.; Metwalli, A. and Alhazza, I. (2015). Camel milk peptide improves wound healing in diabetic rats by orchestrating the redox status and immune response. Lipids Health Dis.14:132.

10- Molitch, M.E.; Defronzo, R.A.; Franz, M.J. and Keane, W.F. (2004). Nephropathy in diabetes. Diabetes Care. 27, S79.

11-Agrawal, R.P.; Beniwal, R.; Kochar, D.K.; Tuteja, F.C.; Ghorui, S.K.; Sahani, M.S.; et al. (2005). Camel milk as an adjunct to insulin therapy improves long-term glycemic control and reduction in doses of insulin in patients with type-1 diabetes A 1 year randomized controlled trial. Diabetes Res. Clin. Prac. 68(2):176–7.

12- El-Sayed, M.K.; Al-Shoeibi, Z.Y.; Abd El-Ghany, A.A. and Atef, Z.A. (2011). Effects of camel's milk as a vehicle for insulin on glycaemic control and lipid profile in type 1 diabetics. Am J Biochem Biotechnol.7:179e89.

13- Agrawal, R. P.; Jain, S.; Shah, S.; Chopra, A. and Agarwal, V. (2011). Effect of camel milk on glycemic control and insulin requirement in patients with type 1 diabetes: 2-years randomized controlled trial. Eur J Clin Nutr 65: 1048 – 1052.

14- Fallah, Z.; Feizi, A.; Hashemipour, M. and Kelishadi, R. (2018). Effect of fermented camel milk on glucose metabolism, insulin resistance, and inflammatory biomarkers of adolescents with metabolic syndrome: A double-blind, randomized, crossover trial. J Res Med Sci. 23:32

15- Claeys,W.L.; Cardoen, S.; Daube, G.; De Block, J.; Dewettinck, K.; Dierick, K.; et al. (2013). Raw or heated cow milk consumption: Review of risks and benefits. Food Control. 31(1): 251–262.

16- El-Ziney, M.G. and Al-Turki, A.I. (2007). Microbiological quality and safety assessment of camel milk (Camelus dromedaries) in Saudi Arabia (Qassim region). Appl Ecology Environmental Res. 5(2): 115–122.

17- Manal MEM, S.h. and Eman, A.M. (2014). Evaluation of Therapeutic Efficiency of Camel Milk on Alloxan-induced Diabetic Rats. J Am Sci. 10(2):53-60.