The activity of camel milk to treated immunity changes that induced by *Giardia lamblia* in male rats

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Abstract
The current study was aimed to detect the activity of camel milk to treat the immunity changes induced by *G. lamblia*. 20 male rats using and divided into four groups (5 rats in each group); control group that received normal saline, second group rat injected intraperitoneally with *G. lamblia* at dose 7X10⁷ cyst/ml. third group rat injected intraperitoneal *G. lamblia* at dose 7X10⁷ cyst/ml and treated with 0.5ml of camel milk for 2 weeks. Fourth group: rat injected intraperitoneally with *G. lamblia* at dose 7X10⁷ cyst/ml and treated with 1ml of camel milk for 2 weeks. The results, after two weeks, show significant changes (P < 0.05) in concentrations of IL-2, IL-6, and IL-8 in the group that injected with *G. lamblia* compared with the control group. The results, after four weeks, demonstrated high significant changes (P < 0.05) in concentrations of IL-2, IL-6, and IL-8 in the group that injected with *G. lamblia* compared with the control group. After using camel milk, concentrations of IL-2, IL-6, and IL-8 in the group are treated groups (after two and four weeks) demonstrated non-significant changes (P < 0.05) with the control group. It was concluded that camel milk possesses activity as an immunity enhancer.

Keywords: *G. lamblia*; camel milk; interleukins

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Introduction
Camel milk, an awesome wellspring of proteins, has enormous natural impacts related to the improvement of irresistible sicknesses [1-3]. These organic exercises are predominantly because of the nearness of peptides and protein in milk [4]. Camel's milk is not pretty the same as other milk of ruminant; having low sugar, low cholesterol, excessive minerals (iron, sodium, magnesium, zinc, and copper), low protein, high nutrient C, B2, and E and high centralizations of insulin. Milk has no unfavorably inclined homes and it tends to be devoured by using lactase missing people and those with feeble safe frameworks [5]. The most referred to employments of camel's milk are as medication against immune system ailments, dropsy, iron deficiency, jaundice, splenomegaly, tuberculosis, diabetes, heaps and asthma [6]. The etiological operator of Giardiasis, *Giardia duodenalis* (syn. *G. intestinalis*, *G. Lamblia*) is one of the most commonplace intestinal protozoan whips of the human [7-8]. *G. lamblia*, is a causative operator, in reality, the most normally distinguished intestinal parasite just as most regular protozoal intestinal parasite detached around the world; especially the disease is more typical in kids than in grown-ups [9]. The colonization of trophozoites in the small digestive tract brings about a decrease in the stature of the microvilli and along these lines lost absorptive surface region [10]. This loss of absorptive surface prompts the mal-ingestion of electrolytes, glucose, and water, with lessens disaccharidase motion [11]. In this way, the point of the present examination is to recognize the job of camel milk in rodents that tainted with *G. lamblia*.

Material & methods
Model of animal
20 male rats in this study, (wt 200-250 gm with age 4-6 month) obtained from college of Veterinary / University of Kirkuk.
**G. lamblia cyst**

Growth of *G. lamblia* were acquired from the feces of kids with intense symptomatic giardiasis. The blister was detached by the strategies by [12]. Densities of sores were evaluated in a hemocytometer [13]. The last suspension was changed in accordance with 7×10⁷ cysts/ml.

**Camel milk**

This investigation was directed during the period stretched out from March to June 2019. Two groups of dromedary camel exist in Badiat Tikrit governorate/Iraq, were utilized in this investigation. These groups relied upon common brushing. Milk tests (250 ml) were gathered in cleaned bottles and moved in a cool box to the research center of clinical pathology, Kirkuk Technical College.

**Design of experiment**

20 male rats were used in this study and then divided as follow (each group consist five rats): Male rat received standard pellet diet only. Male rat injected (intraperitoneal) with *G. lamblia* dose 7×10⁷ cyst/ml. Male rat injected (intraperitoneal) with *G. lamblia* dose 7×10⁷ cyst/ml and treated with 0.5 ml of camel milk for two weeks. Male rat injected (intraperitoneal) with *G. lamblia* dose 7×10⁷ cyst/ml and treated with 1 ml of camel milk for two weeks.

**Detection of Interleukins**

The ELISA (Enzyme-Linked-ImmunoSorbent Assays) method was used for the interleukins detection according to the manufacturer’s instructions supplied by BioSource Company. Interleukin concentrations were detected after two and four weeks from infections to all groups of study.

**Statistical analysis**

The Data have been analyzed by using the program of Minitab for analysis. A statistical change between the capacities of the agencies has once analyzed the use of ANOVA.

**Results**

**Interleukin concentrations after two weeks**

IL-2, IL-6, and IL-8 in an infected group demonstrated increased (P<0.05) compare to the rat of control. IL-2, IL-6 and IL-8 concentrations in third and fourth groups show no significant changes (P < 0.05) with the rat of control as shown in figures (1-3).

**Interleukin concentrations after two weeks**

IL-2, IL-6, and IL-8 in an infected group demonstrated high significant increased (P<0.05) compared with the rat of control. IL-2, IL-6 and IL-8 concentrations in third and fourth groups show no significant changes (P < 0.05) with the rat of control as shown in figures (4-6).
Discussion

In the present investigation, G. lamblia leads to expanded IL-2, IL-6 and IL-8 fixations. In the investigation of [14], they alluded that the contamination with G. lamblia lead to expanded IL-2 and IL-4 focuses on contrast and control gathering. Since G. lamblia is essentially a luminal parasite, the gut-related lymphoid tissue is probably going to assume a significant job in resistant reaction [15]. Thus, the explanation of significant levels of interleukins in present examination is expected to are required from the get-go in the disease to control parasites however not to control contaminations later on [16]. After the treatment by utilizing camel milk interleukins operators back to ordinary extents. The powerful insusceptible framework parts in camel milk may help battle sicknesses. As far as anyone knows, the little size of antibodies, found in the camel milk empowers simple focusing on and infiltration of remote infection-causing substances annihilation by the insusceptible framework [17]. Additionally, camel milk contains different immunoglobulins basically IgM, IgG, IgA, and IgD are found in camel milk all through lactation, drinking milk will improve the safe framework, that may clarify the job of camel milk to treatment the invulnerability changes that actuated by G. lamblia [18-19]. Prior investigations have indicated the antigenotoxic and anticytotoxic effect of camel milk in opposition to cisplatin-instigated toxic high-quality in mice [4]. The utilization of camel milk ensured the workouts of CAT and SOD in CYP-infused mice. These discoveries are in concurrence with the investigations that show that camel milk has immunopotentiating houses and counteracting [3].

Reference