

The Prevalence of Brucellosis Among Sheep in Al Muthanna Governorate

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Abstract

Brucellosis is one of the most widespread zoonotic diseases that causes a great economic loss in most countries, particularly in low- and middle-income countries, and those where no eradication programs are applied. The study covered the period of 6 months (Started from February to July 2021) to investigate the prevalence of brucellosis in sheep slaughtered in three districts slaughterhouses of Al Muthanna governorates. A total of 315 blood samples of slaughtered sheep of both sexes (114 males, 201 females), were examined using of Rose Bengal cart test (RBT), results indicated that, out of all samples tested, (12) of both sexes were found positive reactors (3.80%) including (9) females (2.85%) and (3) males (0.95%). The infection rate of this zoonotic disease varied among the studied districts in the governorate, hereby, the present result represents Al Khudhur, district which recorded the highest infection rate (4.55%) followed by Al Rumaitha district (3.64%), whereas Al Samawah district recorded the lowest prevalence (2.61%). The present calculated results could establish a foundational data base regarding the occurrence of this disease in the sheep population of Al Muthanna governorates. The current results of the study recommend the need for more detailed study covers the incidence of brucellosis in large samples of sheep annually and isolation of the local bacterial strains in Al Muthanna governorates.

Keywords: Brucellosis, infection rate, sheep

Introduction

Sheep husbandry has been practiced in Iraq, particularly in Al Muthanna governorate since earliest times. Its approximate number is (333,500) around (4%) of total Iraqi sheep population (1). Sheep and their derivatives are significant contributors to the economic landscape of Al Muthanna governorate. The nomadic practices adopted by the predominant herd owners have rendered their meat and milk indispensable components of the daily indigenous cuisine. Consequently, any potential zoonotic ailment demands thorough acknowledgment rather than mere superficial attention. Brucellosis, a bacterial disease induced by the gram-negative *Brucella* species, impacts both humans and domesticated animals as well as wildlife. These outcomes lead to significant economic implications in livestock productivity as a consequence of abortion, reproductive inefficiency, sterility, decreased milk production, and noteworthy public health issues (2). According to World Health Organization (WHO), this zoonotic disease considered as a neglected disease in developing countries (3), and it was reported in almost all domestic animals, particularly, sheep in the Middle East, The Arabian Gulf area and Mediterranean countries (4). The prevalence of brucellosis in sheep populations is the highest among other ruminants worldwide (5). *Brucella melitensis* is consider as primary cause of brucellosis in sheep acting as reservoir for maintenance, spread and transmission (6). Several studies covered brucellosis prevalence have been carried out in Iraq (7). In the province of Mosul, the incidence rate

of ovine brucellosis was recorded at 15.9% across various samples from sheep herds (8). Furthermore, a prevalence of 25.6% was observed through the utilization of the Rose Bengal test and the 2-mercaptoethanol test in goats (9). Few reports concerning brucellosis in sheep are available in the literature covered Al Muthanna governorate, it is an important problem that deserves further attention owing to its potential impact on public health in general and its effect on food security in this governorate, particularly it recognized as potential military, civilian and agricultural bioterrorism agents (10). This present study endeavor sought to elucidate the frequency of this zoonotic ailment in sheep that have been slaughtered and are conventionally utilized as meat sources for human consumption across various regions of Iraq. Furthermore, it could provide a database for further epidemiological studies that enhance the evaluation and update of the control programs for brucellosis inside Iraq.

Materials and Methods

Study design

The study was implemented in Al-Muthanna Governorate, the period of 6 months (February to July 2021). The blood samples were collected from (315) clinically healthy sheep Which were slaughtered at three districts in Al Muthanna governorate as followed (Alsamawah (n = 115), Al Rumaitha (n = 110), Al Khudhur (n = 110).

Samples collection and serological test

Serum samples were extracted from blood which withdraw from sheep at slaughter

house then stored at a temperature of 4°C and using the Rose Bengal cart test (RBT) (Granada, Spain). Identification of each sample were also added including , sex , area of the study and so on.

Results

Results indicated that brucellosis in the sheep studied will have infection rate of (3.80%), including (9) females (2.85%) and (3) males (0.95%). The prevalence of this zoonotic disease varied among the studied district in the governorate, however in general, Al Khudhur district recorded the highest infection rate (4.55%) followed by Al Rumaitha district (3.64%), whereas Al Samawah district indicate the lowest prevalence (2.61%) (Table 1, 2, 3).

As it shown in tables (1,2,3), the female infection rate higher than that in males all over the studied districts. In Al Samawah district the prevalence recorded the lowest value (2.61%) in both sex and (2,38%, 2.74%) in male, female respectively (Tab.1). While in Al Rumaitha district the result revealed that prevalence of brucellosis in both sex was (3.64%) and in male, female (2.94%, 3.95%) respectively, (Tab.2). The prevalence of sheep brucellosis in Al Khudhur district recorded the highest value (4.55%) among the three district of Al Muthanna governorate, as well as it showed the highest prevalence (5.56%) among females in the three districts, (Tab.3).

Table 1: Infection rate of sheep brucellosis in Al-Samawah district .

	Total Number	Negative	Positive	Prevalence%
Total	115	112	3	2.61
Male	42	41	1	2.38
Female	73	71	2	2.74

Table 2: Infection rate of sheep brucellosis in Al-Rumaitha district

	Total Number	Negative	Positive	Prevalence%
Total	110	106	4	3.64
Male	34	33	1	2.94
Female	76	73	3	3.95

Table 3: Infection rate of sheep brucellosis in Al-Khudhur district

	Total Number	Negative	Positive	Prevalence%
Total	110	105	5	4.55
Male	38	36	1	2.63
Female	72	69	4	5.56

Discussion

In Iraq, brucellosis is one of the most critical endemic zoonotic diseases (11). It has been recorded a widespread in humans and domestic animals' populations (12). One of the most important animal diseases in the world is brucellosis as reported by different organizations such as World Health Organization (WHO), and Food and Agriculture Organization (FAO), consumption dairy products from sick animals or their unpasteurized milk has a great impact on the body's general health (13).

In terms of recent studies on animals, there is no recent local study that has touched on brucellosis in Al Muthanna governorate, thus our study aimed to gain initial data on brucellosis prevalence in sheep population that reared in three districts of Al Muthanna governorate to gain a better understand on the epidemiological situation and to effectively control brucellosis in Iraq. This research relies on the (RBT) as a random diagnostic tool, specifically a single dilution serum agglutination test commonly employed for the surveillance of infection within entire populations of ruminant animals. (14).

The prevalence of brucellosis in Al-Khudhur and Al-Rumaitha districts showed the highest value among the tested sheep. The first districts is located in the southern part of Al Muthanna governorate center (Al Samawah district) and the second one in the north, both are representing the borders areas that connecting Al Muthanna governorate to other Iraqi governorates.

these results was lower than that recorded by (15) in sheep, and goat herds (16.4%) in Kirkuk governorates. This study revealed that prevalence of brucellosis in females was higher than that in males among all studied districts, while there is variability in the frequency of the disease across different Iraqi localities, this aligns with findings reported by researchers globally, but our results coincide with (16), (17), (18), the parallels observed can be attributed, at least in part, to the comparable conventional methods of sheep husbandry and the analogous management strategies implemented across the districts under study. The geographical location of Al Muthanna governorate in the southwestern Iraq is shared a long penetrable international border with Saudi Arabia, one of the most important factors in Muthanna Governorate that led to the spread of brucellosis is the uncontrolled movement of sheep to and from neighboring areas. On the contrary, the domestic exchange of asymptomatic or carrier animals could potentially contribute to the transmission of the disease. Even there is a low incidence rate that recorded in this study, the need to an effective collaboration between Animal and Human Health sectors is very necessary. Accordingly, the local government should improve the coordination between the two sectors in order to develop a local project for elimination, prevention and eradication of the disease.

Conclusions

The current study is conducted in three districts of Al Muthanna governorate, the highest infection rate (4.55%) recorded in Al

Ali M. A.

Khudhur district is alarming, take in account that control strategies have to continue accordingly.

Conflicts of interest

The authors declare that there is no conflict of interest

Ethical Clearance

This work is approved by The Research Ethical Committee

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انتشار مرض البروسيلا بين الأغنام في محافظة المثنى

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الخلاصة

مرض البروسيلا هو أحد أكثر الأمراض الحيوانية المنشأ انتشاراً والتي تؤثر على الصحة العامة مسببة خسائر اقتصادية كبيرة في معظم البلدان، وخاصة في البلدان المنخفضة والمتوسطة الدخل التي لا يتم تطبيق أي برنامج لاستئصالها. الدراسة شملت فترة 6 أشهر (بدأت من شباط الى تموز 2021) لغرض معرفة مدى انتشار داء البروسيلا في الأغنام المذبوحة في مجازر ثلاث اقصية في محافظة المثنى. تم فحص إجمالي (315) عينة دم من الأغنام المذبوحة من كلا الجنسين (114 ذكراً، 201 أنثى) باستخدام اختبار الـ روز البنغال وقد اظهرت النتائج أنه من إجمالي العينات التي تم فحصها هنالك (12) عينة من كلا الجنسين قد سجلت تفاعلاً إيجابياً (3.80%) منها (9) إناث (2.85%) و (3) ذكور (0.95%). وقد تباينت نسبة الإصابة بهذا المرض بين الاقصية المدروسة في المحافظة، حيث تمثل النتيجة الحالية قضاء الخضر والتي سجلت أعلى نسبة انتشار (4.55%) يليها قضاء الرميثة (3.64%)، بينما قضاء السماوة سجل أدنى معدل انتشار (2.61%). النتائج المدروسة الحالية يمكن أن تشكل قاعدة بيانات أساسية فيما يتعلق بحدوث هذا المرض في قطعان الأغنام في محافظة المثنى. النتائج الحالية للدراسة توصي بالحاجة إلى دراسة أكثر تفصيلاً تغطي مدى حدوث داء البروسيلا في عينات كبيرة من الأغنام سنوياً وعزل السلالات المحلية للمسببة للمرض في محافظة المثنى.

الكلمات المفتاحية: مرض البروسيلا، معدل الإصابة، الأغنام.