

Prevalence and risk factors of caseous lymphadenitis in sheep and goats of Batna area (Algeria)

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Abstract

An epidemiologic investigation of caseous lymphadenitis of the small ruminants (23 herds) was carried out in the Batna area (Algeria). The disease prevalence at the sheep and the goat was 8.9 and 1.6% respectively. This disease was more frequent in the adults. Clinically, the disease did not affect the animal's general state. The internal disease form was not observed in 38 carcasses. The risk factors in the appearance of the disease were: bad hygiene, the precarious shelters and the breeding of several species in the same farm.

Keywords: Caseous Lymphadenitis, Prevalence, Risk Factor, Small Ruminants, Algeria

Introduction

The abscesses disease is a syndrome characterized by a specific caseous lymphadenitis which the incriminated agents are multiple: *Corynebacterium pseudotuberculosis*, *Staphylococcus aureus* subsp. *anaerobius* (micrococcus of Morel) and *Arcanogenum pyogenes* (Boukerrou et al., 1985; de La Fuente et al., 1995; Figueroa and Maier, 2007). The disease is encountered most often in sheep, goats and other animals. It was described in several regions of the world. It provokes important economic losses for the animal industry. It is also considered as a zoonose. (Lopez et al., 1966; Peel et al., 1997; Peake et al., 2006). The objective of this work is to study the prevalence of this disease in the small ruminants (sheep's and goats) of Batna region (Algeria), but also to determine the risk factors the most incriminated in this pathology.

Materials and Methods

The epidemiological survey was conducted in an agricultural region in eastern Algeria (Batna) between 2007 and 2008. It focused on 18 herds, led in extensive breeding, constituted mainly by sheep and some goats. The number of animals in the breedings varies between 39 and 102 heads. In each farm, an epidemiological investigation was conducted through a questionnaire concerning animal numbers in the breeding, species,

age, diet, range, housing environment, prophylaxis and diseases observed. In the field, for each herd, a detailed clinical examination was realized on animals presenting abscesses or ganglionic hypertrophies. Pus collected is emptied into a tube of swabs, then placed in an icebox and transported to the laboratory. In the microbiology laboratory, a macroscopic examination was performed to determine the main characteristics of pus (consistency, odor, color). The samples will be divided into 2 lots, then sowed on agar sheep blood and incubated for 48 hours at 37°C aerobically for the first lot and anaerobically for the second lot. Each type of colony will be object of Gram staining. The identification of germs will be carried out by the method described by certain authors (de la Fuente et al., 1985; Sayed et al., 1995). At the slaughterhouse, an examination of the carcass and viscera was performed to detect lesions on the external lymphatic nodes and various internal organs. The point prevalence was calculated for all data as the number of infected animals divided by the number of individual's sampled $\times 100$.

Results

The abscesses disease is known by farmers in the region under the name "Khanzir". Our investigation revealed that it was present in all farms visited with a frequency of 4.5% in both species. In sheep, the incidence of disease was 8.9%. Adults were more affected than young (8.1 vs 0.8%). (Table 1).

Prevalence in goats was lower than that of sheep (1.6 vs 8.9%). In goats the disease is also more common in adults over a year (1.6 vs. 0%). Clinically, the disease has evolved according to chronic mode. Animals suffering from this disease have primarily presented an infringement of lymphatic nodes of the front of the body (Table 2). They had a variable size depending on the location. Of the 44 animals examined, the region of the head and neck accounted for the largest number of lesions observed with 31.8% for the supratharyngial, 20.5% for the parotid and 15.9% for the mandibular region. The internal form of the disease was not observed on 38 carcasses slaughtered at the abattoir of the region. Among the parameters most favoring appearance of the disease, poor hygiene (38.6%), the shelters (34%) and the breeding of several species of animals in a farm (sheep, goats, cattle, poultry, rabbits) seemed to be the most critical factors in the onset of disease (Table 3). Other factors, such as external parasites (ticks and scabies) and the wounds of the skin of animals during the shearing or by foreign bodies (wire, barbed, etc.), also plays a role in the emergence of these abscesses. The preliminary analysis of 15 samples of pus showed the presence of the following microorganisms: *Corynebacterium pseudotuberculosis*, *Staphylococcus aureus*, *Streptococcus* sp, *Bacillus cereus* and *Micrococcus luteus*. These results are consistent with those found by de La Fuente et al. (1997), Figuerora and Maier (2007) and Malone (2007).

Table1: Prevalence of abscesses disease in small ruminants (n = 971)

Specie		≤ 1 year	> 1 year
Sheep	Total number	261	480
	Prevalence (%)	0,8	8,1
Goats	Total number	47	183
	Prevalence (%)	0	1,6

Table 2: Location of abscesses lymph nodes in small ruminants (n = 44)

Lymph Node	Frequency	%
Supratharyngial	14	31,8
Parotidal	9	20,5
Mandibular	7	15,9
Pre-pectoral	5	11,4
Pré-scapular	3	6,8
Pre-femoral	1	2,3
Popliteal	1	2,3
Ischial	1	2,3
Supramammary	3	6,8
Inguinal	0	0
Axillary	0	0

Table 3: Predisposing risk factors to the abscesses disease observed in 18 farms

	Yes (%)	No (%)
Shelters	34	6,8
Poor hygiene	38,6	2,27
External parasites	25	15,90
Skin injuries	18,18	22,72
Animal species in the same shelter	31,80	9,09
Food shortage	11,36	29,54

Discussion

Several authors claim that the disease abscess is a disease found in all farms (Malone and Fee, 2006; Figuerora and Maier, 2007). The prevalence of infection in small ruminants depends on the animal environment (de La Fuente et al., 1997). The results observed in our study corroborate those of Musa (1998) and Malone and Fee (2006). The frequency of the disease can be high in young animals (Malone and Fee, 2006). Goats seem to be more resistant than sheep to this disease (El Sanousi et al., 1989). In Australia, the observed prevalence rate of caseous lymphadenitis in sheep was estimated at approximately 26% (Paton et al., 2003). In Great Britain, 45% of farmers claimed to have seen abscesses in their sheep (Binns et al., 2002). Concerning the allocation of abscesses on the animal's body, a higher frequency in the anterior region (head, neck, pre-pectoral and pre-scapular lymph nodes) was founded (Carillo et al., 2005). In Sudan, clinical observation showed a frequency of 12.1% of abscesses on the head, neck and shoulders (El Sanousi et al., 1989). External parasites (ticks and scabies), injuries of the skin of animals during the shearing or by foreign bodies (wire, barbed) play a role in the emergence of these abscesses (Sayed et al., 1995). The internal form can exist, cases of multiple visceral abscesses were observed at a local sort of Red Sokoto goats in Nigeria (Akpavie and Emikpe, 2000) and also on certain goat's populations (Frazer et al., 1991). In North America, veterinarians consider the visceral form of the disease an important clinical significance; the syndrome of weight loss is associated with the location of internal abscesses (Baird, 2005). Several parameters must exist for the appearance of this disease. Infected animals can excrete the bacteria in the feces even though the clinical significance of this shedding is unknown. Most transmission in sheep and goats is by contamination of superficial wounds of the skin, especially those caused by shearing (Serikawa et al., 1993). Environmental contamination by food, water, equipment (milking equipment for example) has been studied by several authors (Ellis et al., 1987). Poor personal hygiene (dirty hands after touching equipment or a contaminated animal) can contribute to disease transmission. Other authors have also discussed the possibility of

transmission during castration and docking (Youngs, 2006).

Conclusions

The prevalence of the disease abscesses may be considered important in the region of Batna. The greatest incidence of these abscesses is located in the head. Two or more lesions at the same time in a body part can even be observed. Although this disease appears safe in terms of mortality, but in economic point of view, it leads to a gradual decrease of the animal's weight, production of milk and a devaluation of the skin and wool.

To fight against this infection, it is imperative to develop a program of prophylaxis based primarily on the elimination of risk factors and vaccination of small ruminants.

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