

OCULAR AND CUTANEOUS MYIASIS IN SHEEP IN SAUDI ARABIA

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ABSTRACT

Three sheep were treated from cutaneous and ocular myiasis at the Veterinary Teaching Hospital King Faisal University. Two animals were suffering from deep and smelly necrotized, moist cutaneous lesions on their hind quarters that reached the underlying musculature. The lesion of the third sheep was located in the left eye destroying the globe. By applying pressure to the affected skin, greyish yellow 1-cm long fly maggots, tapering towards the mouth, began to exit the cavities.

*The maggots were microscopically examined and identified as *Lucilia sericata*; Meigen., the green bottle fly, and it was determined that these were cases of fly-strike. After cleaning and disinfecting the lesions, antiparasitic medications were applied topically and systemically. The animals were also treated systemically with antibiotics. After 5 days of therapy the sheep were discharged. Information from the field indicates that cases of fly strike are not uncommon in Al-Ahsa.*

Key Words : Cutaneous myiasis, Ocular myiasis , Haemogram , K F U Vet. Teaching Hospital .

الملخص العربى

تدويد العين والجلد فى الضأن فى المملكة العربية السعودية

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أجريت هذه الدراسة على ثلاث حالات من الضأن التى وردت إلى المستشفى البيطرى التعليمى بجامعة الملك فيصل بالأحساء بالمملكة العربية السعودية وذلك للعلاج من إصابتهم بالتدويد، وكان الحيوان الأول كبش عمره سنتين تقريباً ويعانى من تدويد بعينه اليسرى، أما

الحيوانين الآخرين فكانتا نعجتين عمر كل واحدة منهما حوالي السنة والنصف وحديثى الإنجاب وتعانيان من التدهود الجلدى مع إصابة إحداهما بالتهاب فى المهبل.

أثناء الفحص الإكلينيكي شوهد إتهاب شديد بالعين المصابة للكبش وكذلك إتهاب وتقيح فى الأجزاء المصابة من جلد النعجتين مع خروج صديد من المهبل المصاب، وقد لوحظت يرقعات ذباب التدويد فى الأجزاء المصابة للحيوانات ماعدا المهبل حيث جمعت للتشخيص بمعمل الحشرات وقد تبين أنها ذبابة الحشف الأخضر أو مايسمى بذبابة القارورة الخضراء **(Lucilia sericata : Meigen) The Green Bottle Fly**.

وقد تم أخذ عينة دم من كل حيوان لإجراء بعض إختبارات الدم الخلوية والبيوكيميائية حيث ظهرت نتائج دم الكبش (تدويد العين اليسرى) طبيعية أما نتائج دم النعجتين فقد كانتا غير طبيعية وخاصة النعجة المصابة فى المهبل، حيث أظهرت زيادة فى عدد كرات الدم البيضاء وفى إنزيم الكراتين كينيز **CK**.

وقد تم علاج هذه الحالات بتنظيف أماكن الإصابة بالمطهرات ومحاليل مضادة للطفيليات وأعطى كل حيوان جرعة من دواء اليكتوماكس المضاد للطفيليات **(of Dectomax® (Pfizer 1.5ml)** بالإضافة للعلاج بالمضاد الحيوى بنتستريب **(PENSTREP 20/20® (FARVET)** بجرعة واحد ميللى لكل عشرين كيلو غرام من وزن الحيوان لمدة خمسة أيام وقد تم فسح الحيوانات فى اليوم الخامس.

INTRODUCTION

Cutaneous myiasis is caused by fly species of the family Calliphoridae and they are divided into two main groups, a primary species, which are able to initiate the disease, and a secondary species, which require a previous damage or infestation of the host by a primary species **(Urquhart et al., 1987)**. The secondary species and new waves of the primary species are attracted to sheep skin lesions, primarily by the odour that is emitted **(Fenton et al., 1999; Martin and Aitken, 2000; Staric et al., 2002; Urquhart et al., 1987; Wall and Smith, 1996)**. Although these flies are facultative parasites and their maggots can develop off the host on cadavers and manure, the maggots of the species *Lucilia cuprina* are an exception and live almost exclusively as parasites **(Staric et al., 2002)**. Therefore this species is considered an obligate parasite by many authors **(Radostis et al., 2000; Martin and Aitken 2000)**. *Lucilia sericata*

and *Lucilia cuprina* are considered as the main primary species in central and western Europe **(Staric et al., 2002)**. However their larvae are considered as the most important causative agent of myiasis in tropical and subtropical regions **(Hira et al., 2004; Staric et al., 2002)**.

Myiasis caused by the obligate parasitic fly maggots of *Chrysomya* spp. eg *C. bezziana* is also possible to be found in AL- Ahsa since they were reported in Saudi Arabia **(Alahmad, 2002; Banaja and Ghandour, 1994; Eesa and El-Sibae, 1993)**. Maggots of these species are also called screw worms and are the cause of large losses of farm animals **(Staric et al., 2002)**. There are many written reports emphasising the great economic losses caused by cutaneous myiasis in sheep breeding countries, such as South Africa, New Zealand and Australia **(Staric et al., 2002; Urquhart et al., 1987)**. It is estimated that in Australia 3,000,000 sheep die because of cu-

taneous myiasis each year (**Bowen et al., 1999**). The prevalence of cutaneous myiasis in England and Wales is estimated at 1.6 % of sheep, of which 12,000 die each year (**French et al., 1996**). Besides mortality, the disease causes other financial loss as it also affects wool production, animal growth and results in additional expenses due to the cost of prevention and sanitation (**Staric et al., 2002; Urquhart et al., 1987**).

MATERIALS AND METHODS

Owner's complaint and Physical examination :

Three sheep (from a flock of 130sheep) were brought to the Veterinary Teaching Hospital for treatment. They were one male (sheep A) suffering for ocular lesions in the left eye and two females (sheep B and C) suffering from cutaneous lesions.

1- Ocular myiasis :

The first sheep (Sheep A) was about 2 years old ram had an irregular laceration on the lower eye-lid, conjunctivitis corneal opacity and several maggots were seen actively motile. However physical examinations showed that the animal was generally normal.

2-The cutaneous myiasis :

The other two sheep (B and C) were females and both had recently lambed. The owner noticed that they were restless, neither eating nor caring for their lambs. The owner mentioned also that they had dirty wool on their heads and they were biting themselves on the hindquarters. He noticed that they had wounds which were infested with worms

in the area around the base of the tail. The affected area also had a distinct rotting odour . Further examination of the sheep showed that their fleeces were unshorn, dense, humid and dirty on the surface. One sheep (sheep B) had a massive purulent vaginal discharge that soiled the caudal part of the abdominal wall from both sides.

During a detailed examination of the skin we found necrotized, moist, black skin with many small holes and few larger ones in the breech area. On each side of the tail there were two deeper ulcerations (sheep B) nearly reached the muscular tissues. Many fly maggots were seen in the wounds of both animals. They were tapered towards the mouth and ranged from a few mm to 1.3 cm in length. Many nests were found in the fleece on the sacral and caudal parts of the lumbar area. They were round and approximately 1.3 cm in diameter and full of fly maggots. Some of them had reached the skin causing erythema. The two animals had pyoderma on the ventral part of the tail and around the anus and both of them were tachycardic (above 90 beats per minute), tachypnoeic (above 80 breaths per minute) and febrile (body temperature above 40°C).

Hematology Test :

Blood samples were collected from the jugular vein of the three sheep for complete hemogram as well as measurement of the activity of the creatinine kinase enzyme.

Identification of the flies :

Larvae were collected from the lesions of the three animals in order to be identified in the entomology laboratory. Some of them were

examined under the stereomicroscope. Others were reared for adult examination. The work was done according to **Soulsby (1986) and Walker (1994)**.

Treatment :

In case of cutaneous myiasis of sheep B and C, treatment of the animals was performed according to **Staric et al (2002)**. The affected areas were first shorn and then washed with antiparasitic solution which was made of 30 grams trichlorofon (Neguvon® from Bayer) until it was free of all dirt, necrotic tissue and visible fly maggots. The affected eye of the male sheep A was cleaned from maggots and necrotic tissues and washed with eye disinfectant solution (15% Boric acid). Then all the three sheep were given 1.5 ml of Dectomax_ (Pfizer; doramectin called ivermectins) subcutaneously in order to kill fly maggots that may have survived by burrowing into the tissues. Because of the severity of the lesions of all the three animals they were given penicillin and streptomycin the form of PEN-STREP 20/20_ (FARVET) at a dosage of 1 ml per 20 Kg BW as intramuscular injection in single dose daily (SID) for 5 days.

RESULTS

Physical Examination :

The clinical pictures of the two female animals (Sheep B and C) were typically skin myiasis which resulted as a reflex of bad management of the animals. The same reasons also lead to ocular myiasis of the ram (Sheep A). After receiving good managements treatments all the three animals returned to their normal healthy clinical pictures.

Hematology Test :

Laboratory investigation showed that the sheep B had a slightly increased hematocrit level (40.1 l/l), slight leucopenia $4.8 \times 10^9/l$ and thrombocytopenia ($10^5 \times 10^3/mm^3$). Sheep A had a slightly reduced number of erythrocytes ($7.7 \times 10^6/mm^3$), a decreased hemoglobin level (9.2 g/l) and higher than normal number of segmented granulocytes 50 %. The other CBC and differential white blood count values were normal. The activity of the creatinine kinase enzyme was elevated in both sheep, 163 U/l in sheep C and 151 U/l in sheep B. In case of ocular myiasis (sheep A) the hematology results were seen quite normal (see table 1).

Identification of the flies :

The larvae and adult flies were identified as the green bottle fly, *Lucilia sericata* Meign.

Treatment :

Two days after the therapy the body temperature of the two sheep (B and C) had returned to normal and there were no maggots found during an inspection of the affected skin and fleece and the necrotized skin dried and healed quickly. Three days later the necrotic skin had begun to peel, revealing the viable skin under it. The purulent vaginal discharge of sheep B completely ceased after four days. The ocular lesion of sheep A responded to treatment after three days. Animals were discharged after five days.

DISCUSSION

The clinical picture which was described in is typical of skin myiasis. **Staric and his collaborators (2002)** reported a similar case in

Slovenia whereas 2 sheep of a bigger flock (250 sheep) were affected in the autumn following their first lambing. In fact cutaneous myiasis most commonly affects the hindquarters due to the animal's urine, feces and lochia beside the bad and moist conditions which result from the poor animal management (Radostits et al., 2000; Fenton et al., 1998; James et al., 1994). This together with warm temperature and rains will constitute an ideal environment for the development of the eggs and maggots of myiasis flies (Martin and Aitken, 2000; French et al., 1996; Urquhart et al., 1987). In fact all the factors that predispose sheep to cutaneous myiasis were found in these three cases. The two female sheep had just lambed, they were unshorn, unprotected by insecticides, beside the weather was warm and humid. Secondary bacterial invaders may aggregate skin lesions caused by cutaneous myiasis (Staric et al., 2002). The ram may get the infection in his eye from them. This together with the Subsequent waves of fly-larvae constant infestations may extend the skin lesions (Staric et al., 2002). This may infect other parts of the skin or other organs of the same animal or other animals and it showed how the ram was affected in his eye. Fly maggots also excrete ammonia which may be absorbed by the skin, leading to secondary affliction. For this reason the heavily infested animals may show signs of general disturbance, debilitation and a loss of condition (Staric et al., 2002). Therefore this is the cause which makes sheep to change their usual behavior (O, Brien et al., 1997). This explains how the ram was nearly quite and calm, while the two ewes were restless. These changes were reflected in the haemogram of the three animals (see table 1). The

raised activity of the creatinine kinase enzyme (CK) could be a consequence of the tissue damage caused by the cutaneous myiasis (Staric et al., 2002). The physical efforts associated with animal activities eg. moving the sheep from pasture to home may lead to raise it (Staric et al., 2002). In our cases only the ewes with cutaneous myiasis showed the raised CK (Sheep B 151 U/I and Sheep C 163 U/I) while the ram (sheep A) was 145 U/I (about the normal : 120 U/I), however all the animals were moved from the same place and brought to the hospital . Therefore activity is not a stronger reason behind the raise of CK than cutaneous myiasis. This is supported by some authors who had also described the similar clinical picture of sheep suffering from cutaneous myiasis (Radostits et al., 2000; Aiello, 1998; O,Brien et al., 1997). Therapy of affected animals should be adjusted for each case according to its condition and situation. For example in mildly infested animals without visible skin lesions, just shearing the wool from the affected area can be enough in favorable conditions (Staric et al., 2002). However in areas where cutaneous myiasis is more widespread, the wool is routinely shorn from the sheep hindquarters and the procedure is called tagging or crutching (Radostits et al., 2000). In fact this will prevent the eggs or maggots to develop as they desiccated and not developed (Staric et al., 2002). This will protect the animals from being fly-struck in the hindquarters for about 6 to 8 weeks (Radostits et al., 2000; Aiello, 1998). It is well known that cleaning and shearing the whole sheep prevents strikes on other parts of a body, while shearing the head or around prepuce prevents strikes on the head or pizzle and this would best cure for most of the mild

cases and by correctly timing the shearing of sheep, it would also be a good way to prevent fly-strikes of predisposed sheep (**Staric et al., 2002**). Practically this is the most correct way to prevent cutaneous myiasis in Saudi Arabia.

For more heavily affected sheep it is recommended, in addition to the shearing, a topical treatment of the affected area with both larvicides and insecticides. In case of sheep with deep cutaneous myiasis wounds it is recommended to be thoroughly cleansed with disinfecting agents and treated with broad spectrum antibiotics as it was followed in our cases where all sheep responded very well to our therapy and completely recovered. However in more refractory infections, this should be done with antibiotics following culturing and sensitivity testing. Supportive therapies like infusions, analgesics and anti-inflammatory medicines could also be given to more heavily affected animals to help stimulate recovery (**Staric et al., 2002**).

Preventive measures against cutaneous myiasis such as cleansing shearing the sheep, tail docking, and hygienic lambing etc. can reduce a sheep's susceptibility to fly strike or reducing the fly population with the use of insecticides and larvicides or with ge-

netically altered and sterile male flies can also prevent fly strikes (**Radostits et al., 2000; Staric et al 2002**). We are of the opinion that myiasis (especially the cutaneous myiasis) should get more attention because of the increasing number of animals (particularly sheep) in Al-Ahsa and the losses that it can cause every year according to the report of The Veterinary Teaching Hospital (2007). Therefore a strategy for preventing and combating this disease should be established Saudi Arabia and sheep herds owners should be more informed on how to recognize and prevent the disease.

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Table 1: The hematological values and activity of creatinine kinase in the three sheep A , B and B .

The Parameters	The Tested Animals			Normal values
	Sheep A	Sheep B	Sheep C	
Erythrocytes	7.8	7.7	10.18	7.8 - 13 x 10 ⁶ /mm ³
MCV	28 l	40	39	28 - 44 fl
MCHC	31	30	30	31 - 34 g/dl
MCH	8	12,0	11,8	8 - 12 pg
Hb	9	9.2	12	9 - 14.7 g/dl
Ht	0.27	30.7	40.1	0.27 - 0.45 l/
Thrombocytes	250	294	105	250 - 750 x 10 ³ /mm ³
Leucocytes	5	5.9	4.8	5 - 12 x 10 ⁹ /l
Leucocytes	50	49	67	50 - 73 %
Seg. gran.	17	50	30	17 - 45 %
Bands	3	0	0	0 - 3
Eosinophils	2	1	3	1 - 10 %
Monocytes	0	0	0	0 - 6 %
Basophils	0	0	0	0 - 2 %
CK	125	151	163	to 120 U/l

A= Male sheep with ocular **myiasis**

B=Female sheep with cutaneous myiasis and vaginal infection

C= Female sheep with cutaneous myiasis only

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