Bacteriological and Pathological Studies on the Causes of Mortalities among Sheep in Sharkia-Governorate Farms

By
Hala Foad Habashy*; Fadel. N.G. ** and El Shorbagy. M.M. *

SUMMARY

Some sheep farms in Sharkia Governorate showed mortality rate ranged from (12.2 to 16.9 %). Most of the affected cases showed respiratory manifestation, while in other farms diarrhea with slight respiratory manifestation were the most observed symptoms. Samples were taken from dead, sick, emergency slaughtered and from contact apparently healthy cases. Samples include nasal swabs, serum and tissues for traditional bacterial examinations, ELISA and for histopathological examination.

The bacteriological examinations reflects the presence of mainly *P. multocida* associated with *C. perfringens* in some farms. The histopathological changes in the lung, liver, kidney, spleen, lymph node, intestine and heart were presented.

From this study it was concluded that *P. multocida* and *C. perfringens* infection among sheep in Sharkia governorate farms constitute a major problem and need intensive precaution and preventive measures including; application of good hygiene and management in animal farms, application of vaccination programs allowed, feeding animals with balanced ration, and raising the immune status of the animals. Among methods used in diagnosis of pasteurella ELISA was more efficient. *P. multocida* and *C. perfringens* infection could be diagnosed histopathologically and more efficient in studying the severity of infection.

INTRODUCTION

Small ruminants play an important role in nutrition and income of people around the world. They serve primarily as source of meet also provide milk, skin, and wool (*Mbilu, 2007*). Among the causes of mortalities in sheep dis-
eases of the respiratory system including pneumonia, debility, and unspecific toxemias were the major cause of deaths (Maru et al. 1993). Pneumonia is widespread among sheep and goat in sub-Saharan Africa and it is considered to be one of the most important causes of losses in the small ruminant industry (Kusiluka and Kambarage, 1996).

The respiratory affection is complex involving stress factors, bacteria and virus infection. Bacterial pneumonia is regarded as the most frequent and serious causes of mortality and economic losses associated with respiratory diseases of sheep (Andrawis, 2001). However pasteurellosis (Enzootic pneumonia) regarded as the most important respiratory disease affecting sheep caused mainly by Pasteurella multocida and Pasteurella haemolytica. Pasteurella spp. Occur as apart of the normal flora of the nasopharynx but under initiation of complex environmental, genetic, stresses, and immunological factors will cause diseases Gilmour and Angus (1983) and Andrawis (2001).

On the other hand an aerobic bacteria especially clostridia are among the major bacteria which act as primary or secondary causes of many diseases threaten the health of the sheep (Quinn et al., 2002). In sheep as in many other species of domestic animals clostridial disease still present challenges to veterinary practioners, diagnosticians (Songer, 1998). Enterotoxaemia is a broad term used for a group of enteric intoxication associated with different types of C. perfringens. In sheep the disease has been well characterized clinically (Blood et al., 1993).

The aim of the present study is to determine the possible causes of mortalities in sheep among some farms in Sharkia Governorate and the pathological associated lesions.

**MATERIAL AND METHODS**

1- Animals:

Five sheep farms in Sharkia Governorate showed mortality rate ranged from (12.2 to 16.9 %). Most of the affected cases showed respiratory manifestation as cough, nasal discharge, fever, while in other farms diarrhea with slight respiratory manifestation were the most observed symptoms.

2- Samples:

Samples were taken from dead, sick, emergency slaughtered as well as contact apparently healthy cases.

1. Bacteriological studies:

Samples for bacteriological examinations include (124) nasal swabs, (104 were collected from diseased sheep and 20 from apparently healthy cases.
healthy sheep) as presented in table (1).

A total of 90 tissue samples, 12 from dead, 6 from emergency slaughtered cases), were taken from lung, trachea, spleen, kidney and liver for aerobic examinations. Tissue samples (a total 72 samples) for anaerobic examinations were taken from liver, intestine, kidney and spleen (table 2).

Blood samples were collected for ELISA and bacteriological examination (104) were collected from diseased and 20 from apparently healthy.

1. Bacterial isolation and identifications:

The nasal swabs were cultured into peptone water 1% and inoculated over night and then cultured into DAS medium (1% crystal violet), MacConky and Blood agar media. Samples which collected from slaughtered sheep were cultured anaerobically on cooked meat media (Willis, 1977); sheep blood agar and neomycin sulphate blood agar media (Carter and Cole, 1990). The same organs were inoculated directly onto DAS medium, MaConkey bile salt agar, and blood agar and incubated aerobically at 37°C for 24-48 hrs. The suspected growing colonies were studied for morphological and biochemical characters according to Kreig and Holt (1984).

2. Pathogenicity and virulence test for Pasteurella to mice;

The bacterial suspension was made by plate washing technique (Stamp et al., 1955) from the original culture which was plated onto 10% sheep blood agar plate and incubated for 24 hrs. at 37°C. Inoculated plate was flooded with 5ml saline solution and colonies were removed from the solid medium by gentle rubbing with glass rode. The resultant granular suspension contained an average 1.5 x 10^8 organism per ml by matching with McFarland tube no (2) (Wessman, 1964). Three mice were injected intraperitoneal with each isolate.

3. Potassium thiocyanate extract (KSCN) antigen;

*Pasterulla multocida* was grown on blood agar plates harvested with 0.5 m KSCN and 0.425 m NaCl PH 6.3 and incubated in water bath at 37°C for 5 hrs. Cells were removed by centrifugation at 300 g for 30 min. the supernatant was dialyzed against 0.01 m Tris-HCl and 0.32 NaCl (Singh and Jayprakason, 2001). The protein content in the extract was adjusted to 5 g/ml (Lowery et al., 1951).

4. Serum ELISA.

In micro titer plate the antigen was used performing the checker board titration to determine the optimum antigen concen-
tration and conjugate dilution. Plates were coated with KSCn extract antigen (5 g/ ml) left overnight at 4°C. After washing with PBS, the 1:50 diluted serum samples were added and incubated at 37°C for 1 hr and washed 3 times with the same washing buffer. Then 100 µ of 1:3000 rabbit anti-sheep radish peroxidase conjugate was added and left to react at 37°C for 30 minutes (The optimum concentrations of the antigen and the conjugate were determined by checker board titration). The plates was washed again three times and finally 100 µl of the substrate O-phenylenediamine containing 0.001% H2O2 was added. After the color developed 25 µl of 8 NH2SO4 were added to stop the reaction and plates was read at 490 nm. Antigen, serum conjugate and substrate controls were set up as appropriate controls; end point was calculated as the mean value of the negative sera plus two standard deviation (Singh and Jayprakason, 2001).

II. Histopathological studies:

Tissue samples from sheep (lung and its associated lymph node ,liver, kidneys, spleen, heart, and intestine) were collected from twelve freshly dead cases as well as six emergency slaughtered cases.

The collected tissue samples were preserved in 10% neutral buffered formalin washed in running water and dehydrated in different grades of concentrated alcohol, cleared in xylene and embedded in paraffin. Paraffin sections of 5 µ thickness were obtained and stained by Haematoxylin and Eosin (Bancroft et al., 1996). Then covered and examined microscopically.

Table (1): Type and Number of samples collected from sheep with different disease condition.

<table>
<thead>
<tr>
<th>Animal status</th>
<th>Nasal swabs</th>
<th>Blood samples</th>
<th>Organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diseased sheep</td>
<td>104</td>
<td>104</td>
<td>-</td>
</tr>
<tr>
<td>Dead &amp; slaughtered sheep</td>
<td>-</td>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>Apparently healthy sheep</td>
<td>20</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>142</td>
<td>90</td>
</tr>
</tbody>
</table>
Table (2): Type and number of organs which collected from fresh dead
and slaughtered sheep for bacteriological and pathological ex-
aminations.

<table>
<thead>
<tr>
<th>Type of organ examined</th>
<th>No. of examined organs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aerobically</td>
</tr>
<tr>
<td>Lungs</td>
<td>18</td>
</tr>
<tr>
<td>Trachea</td>
<td>18</td>
</tr>
<tr>
<td>Spleen</td>
<td>18</td>
</tr>
<tr>
<td>Kidneys</td>
<td>18</td>
</tr>
<tr>
<td>Liver</td>
<td>18</td>
</tr>
<tr>
<td>Intestine</td>
<td>-</td>
</tr>
<tr>
<td>Lymph node</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>90</td>
</tr>
</tbody>
</table>

RESULT

Bacteriological results:
Isolation of Pasteurella multocida and clostridia from specimens
were presented in tables (3, 4 and 5).

Table (3): Type and number of samples with number and percentage of
isolates.

<table>
<thead>
<tr>
<th>Animal status</th>
<th>Type of samples</th>
<th>No. of samples</th>
<th>P. multocida</th>
<th>Clostridia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Diseased sheep</td>
<td>Nasal swabs</td>
<td>104</td>
<td>57</td>
<td>54.8</td>
</tr>
<tr>
<td></td>
<td>Blood samples</td>
<td>104</td>
<td>28</td>
<td>26.9</td>
</tr>
<tr>
<td>Slaughtered sheep</td>
<td>Internal organs</td>
<td>18*</td>
<td>18</td>
<td>100</td>
</tr>
<tr>
<td>Apparentely healthy sheep</td>
<td>Nasal swabs</td>
<td>20</td>
<td>6</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td>Blood samples</td>
<td>20</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>

* Number of slaughtered sheep examined for its internal organs.
Table (4): Typing of isolated *C. perfringens* and prevalence of toxigenic and non-toxigenic strains in examined internal organs in sheep.

<table>
<thead>
<tr>
<th>Site of isolate</th>
<th>No. of examined samples</th>
<th>No. and % of isolated strains</th>
<th>No. of type of toxigenic strains A B D</th>
<th>Non toxigenic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Liver</td>
<td>18</td>
<td>5</td>
<td>27.7</td>
<td>3</td>
</tr>
<tr>
<td>Intestine</td>
<td>18</td>
<td>6</td>
<td>33.3</td>
<td>3</td>
</tr>
<tr>
<td>Spleen</td>
<td>18</td>
<td>3</td>
<td>16.6</td>
<td>3</td>
</tr>
<tr>
<td>Kidneys</td>
<td>18</td>
<td>3</td>
<td>16.6</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>17</td>
<td>64.7</td>
<td>11</td>
</tr>
</tbody>
</table>

Table (5): comparison between *Pasteurella multocida* isolation and ELISA technique in diagnosis.

<table>
<thead>
<tr>
<th>Animal status</th>
<th>No. of examined Blood samples</th>
<th>Traditional</th>
<th>ELISA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Diseased</td>
<td>104</td>
<td>28</td>
<td>26.9</td>
</tr>
<tr>
<td>Apparently healthy</td>
<td>20</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>

As shown in table (3), it was noted that out of 104 nasal swabs revealed that isolation of *P. multocida* is 57 with an incidence of 54.8% while out of 104 blood samples the number with positive isolation was 28 with an incidence of 26.9%. *Pasteurella multocida* were isolated from all internal organs of 18 cases dead and emergency slaughtered with an incidence of 100%. While the isolation of *C. perfringens* from internal organs were recorded in 6 cases out of 18 with an incidence of 33.3%. Meanwhile the isolation of *P. multocida* from apparently healthy sheep out of 20 nasal swab revealed positive isolation in 6 cases with percentage of 30%, while isolation from blood samples was 2 cases out of 20 with percentage of 10%.

Typing of isolated *C. perfringens* and prevalence of toxigenic and non-toxigenic strains in examined internal organs of sheep was explained in table (4). It was noted that out of 18 internal organs ex-
examined for *C. perfringens* isolation, the highest percentage of number of positive strains was recorded in intestine (33.3%), while in liver (27.7%) in spleen and kidney (16.6%). Out of 5 *C. perfringens* isolates from liver 3 was type A toxigenic while 2 was non toxigenic type D with an incidence 60% and 40% respectively. Out of 6 *C. perfringens* isolates from intestine, 3 was type A, 2 was type D and one of non toxigenic with an incidence of 50%, 33.3% and 16.6% respectively. All of 3 *C. perfringens* strains isolated from spleen was toxigenic type A with percentage of 100%. Finally out of 3 *C. perfringens* strains isolated from the kidney 2 was type A toxigenic and 1 was type D with percentage of 66.7% and 33.3% respectively. The total incidence of *C. perfringens* isolated strains from internal organs was type A (64.7%), type D (29.4%) and non toxigenic (5.9%).

As shown in table (5), out of 124 blood samples *P. multocida* was identified in 28(26.9%) and 35 (33.6%) from diseased sheep examined by traditional bacterial isolation and by ELISA technique respectively, while out of 20 blood samples from apparently healthy sheep *P. multocida* was identified in 2 (10%), and 10 (50%) of samples examined by traditional bacterial isolation and by ELISA technique respectively.

**Pathological results:**

1- **Pathological feature in freshly dead animals as well as scarified sheep:**

The lungs showed mainly hepatization of the apical lobe mostly with involvement of other lobes occasionally. The associated lymph node showed swelling. The liver showed mainly congestion while in few cases friable liver with grayish red pinpoint foci were observed. Kidney appear normally in most of the cases, while in few cases kidney and urinary bladder appeared severely increased in size and congested. The intestine appeared congested. No apparent pathological alterations in spleen and heart.

2- **Histopathological findings:**

Lungs showed mainly edema and dilatation of interlobular area, congestion of blood vessels and capillaries associated with perivascular and peribronchial infiltration of mononuclear inflammatory cells. Diffuse infiltration of neutrophiles filling the alveolar lumen with few alveolar macrophages were observed in some cases (Figs., 1-4). The associated lymph nodes showed hyperplasia of lymphoid follicles with sever infiltration of neutrophiles in few cases (Figs., 5 & 6).

The liver mostly showed dilated engorged blood vessels and sinusoids sever diffuse necrobiotic changes in hepatocytes with peri-
vascular mononuclear inflammatory cell infiltration. In few cases focal area of necrosis with loss of cellular details and architecture, sever neutrophilic infiltration and hemorrhage were observed (Figs., 7 & 8).

The kidney mostly showed dilated engorged blood vessels, hemorrhages, granular and vascular degenerative changes in renal tubular epithelium, and inter tubular mononuclear inflammatory cells infiltration. Hypercellularity of glomeruli and cystic tubules were seen in few cases (Figs., 9 & 10).

The spleen showed, depletion of lymphocytes was the most common lesion, while hemorrhage was observed in few cases (Fig. 11).

The intestine in most of the cases examined showed degeneration and detachment of intestinal epithelium with congestion, hemorrhage and mononuclear inflammatory cell infiltration in propria sub mucosa (Fig 12). The heart showed no characteristic changes except congestion of blood vessels.

Fig. (1): Lung of sheep showing areas of atlectasis with engorged capillaries and mononuclear inflammatory cells infiltration (H&E X 200).

Fig. (2): Lung of sheep showing peribronchial, diffuse and impacted alveolar lumen with inflammatory cells infiltration (H&E X 100).

Fig. (3 & 4): Lung of sheep showing thickened interalveolar septa, congestion, impacted alveolar lumen by polymorphnuclear inflammatory cells mainly , with few alveolar macrophages. (H&E X 400).
Fig. (5): Lymph node of sheep showing hyperplasia of lymphoied follicles with polymorphneuclear inflammatory cells infiltration (H&E X 200).

Fig. (6): Lymph node of sheep showing hyperplasia of lymphoied follicles with sever polymorphneuclear inflammatory cells infiltration (H&E X 400).

Fig. (7): Liver of sheep showing focal area of necrosis, degenerative changes in hepatocytes mainly vHackular degeneration with diffuse mononuclear inflammatory cells infiltration (H&E X 100).

Fig. (8): Liver of sheep showing focal area of necrosis, degenerative changes in hepatocytes mainly vHackular degeneration with diffuse polymorphneuclear inflammatory cells (H&E X 400).
Fig. (9): Kidney of sheep showing focal area of necrosis, hemorrhage, degenerative changes in renal tubular epithelial cells, and destruction of Bowmans capsule (H&E X 400).

Fig. (10): Kidney of sheep showing degenerative changes in renal tubular epithelial cells formation of cystic tubules (H&E X 400).

Fig. (11): Spleen of sheep showing depletion of lymphocytes and few hemorrhage (H&E X 200).

Fig. (12): Intestine of sheep showing congestion of blood vessels mononuclear inflammatory cells infiltration in propria sub mucosa (H&E X 400).
DISCUSSION

The clinical symptoms in farms under observation in our study were respiratory manifestation associated with diarrhea in few cases and mortality ranged from 12.2-16.9%. This symptoms were referred to the isolation of Pasteurella multocida associated with C. perfringens in few cases, similar clinical symptoms were reported by (Soher and Ali, 1993; Ali and Mahmoud, 1993 and Miyashiro et al., 2007) associated with Pasteurella multocida and C. perfringens in sheep.

Pneumonic pasteurellosis was first described in Iceland and subsequently has been reported in many countries such as Australia, Britain, Ethiopia, Norway, South Africa, Somalia and USA (Gilmo-ur and Angus, 1983).

Isolation of Pasteurella multocida from nasal swabs and blood samples from diseased cases were recorded in the present study (table 3), the incidence were 54.8% and 26.9% respectively. A higher incidence was reported by Selim et al. (2003) who revealed an incidence of 89.1 %, 67.2 % from nasal swabs and blood samples respectively. Previous investigator reported isolation of Pasteurella multocida from diseased and apparently healthy sheep as (Ores et al., 1997; Rusavai and Fodder, 1998 and Andrawis, 2001). In the present investigation sheep harbor Pasteurella multocida (85 isolates out of 104) more or less close to results reported by Ugochukwu (1985) who found the incidence among diseased sheep was 75%. On the other hand higher incidences were recorded by El Sherif and Abd El-Ghani (1974), Bauijihad and Leipold (1995) who reported it as 85.9% and 90.2%, respectively. Mean while apparently healthy cases in the present study revealed an incidence of 40% which agreed with Andrawis (2001), who reported an incidence of 39.6% other investigators reported higher incidence 68.5% and 78.5% (Elsherif and Abd el Ghani, 1974 and Foder et al., 1990). The difference in incidence among apparently healthy cases may be explained due to carrier cases of sheep (Al Tarazi and Dognall, 1997). Our study revealed that Pasteurella multocida was isolated in an incidence of 30% - 10% from nasal swabs and blood samples of the apparently healthy sheep, these results were almost agreed with Selim et al. (2003) who reported 33.3% and 8.1% incidence from nasal and blood samples of apparently health cases, respectively.

The incidence of Pasteurella multocida which were isolated from the internal organs from
sheep (18 cases) were 100%, these result agreed with the obtained results recorded by Sunder and Kumar (2001) and Selim et al. (2003) of Pasteurella multocida isolation from internal organs of freshly dead sheep.

Our study showed that applying the serum ELISA for diagnosis of pasteurella in living sheep was accurate and rapid when compared to the traditional isolation and identification of pasteurella organisms. As presented in table 5 the percentage of positive diseased cases were 33% while the traditional bacteriological studies revealed 26.9%. Also, among the apparently healthy cases ELISA showed 50% positive comparing to 10% by the traditional isolation and identification. These findings agreed with Singh and Jayprakason (2001) and Smith and Holdman (1968).

The present work showed that numbers of positive samples of C. perfringens isolated from liver was 5 isolates by percentage 27.7%, while in intestine 6 isolates 33.3% and in spleen and kidney 3 isolates 16.7% as present in table (4), these findings agreed with Ghoniem et al. (1972). From the obtained results it could be noticed that the incidence of type A (64.7%) while type D (29.9%) and non toxigenic strain (5.9%), so the C. perfringens type A, D, as a normal flora may indicate the incidence of enterotoxaemia in sheep (Sterne and Warrack, 1964).

The pathological alterations observed in the different internal organs were similar to those previously described by several authors associated with infection by Pasteurella multocida and C. perfringens infection (Niilo, 1980; Hancock et al., 1991; Soher and Ali, 1993; Ali and Mahmoud, 1993; Center for Food Security and Public Health, 2004, Center for Food Security and Public Health, 2005 and Miyashiro et al., 2007). In farms with mixed infection by both organisms the pathological and histopathological lesions were more sever than farms with P. multocida infection only.

The lung showed lesions varied from congestion of capillaries with thickened interlobular septa and atlectasis, to sever lesions of perivascular and perbronchial mononuclear inflammatory cell infiltration and diffuse neutrophilic infiltration filling the alveolar space with few alveolar macrophages. Similar lesions were described by Hancock et al. (1991); Ali and Mahmoud (1993); Kusiluka and Kambarage, (1996) and Nasser (2000) associated with P. multocida infection, while, Center for Food Security and Public Health (2004 and
described only pulmonary edema and congestion in sheep infected by *C. perfringens*. The mixed *P. multocida* with *C. perfringens* infection in our study resulted in severe histopathological changes in tissues of the lung. The associated pulmonary lymph node shows lymphoid hyperplasia with severe neutrophilic infiltration. Abscesses in lymph node were described by Kusiluka and Kambarage (1996) and Nasser (2000).

The histopathological changes in the liver were necrobiotic changes in hepatocytes, focal necrosis with neutrophilic as well as mononuclear inflammatory cells infiltration. These changes were more pathognomonic in sheep from farms with mixed *P. multocida* and *C. perfringens* infection. Similar lesions were described by (Soher and Ali, 1993, Ali and Mahmoud, 1993 and Center for Food Security and Public Health, 2004).

The histopathological changes in the kidney of sheep from farms with *P. multocida* infections only were mostly congestion, haemorrhages, and few necrobiotic changes in renal tubular epithelium. While in sheep from farms with mixed *P. multocida* and *C. perfringens* the kidney showed hypercellularity of glomeruli, thrombosis and mononuclear inflammatory cells infiltration, in addition to the above mentioned changes. Similar lesions were described by (Niilo, 1980; Ali and Mahmoud, 1993 and Miyashiro et al., 2007).

The spleen showed depletion of lymphocytes and hemorrhage and such lesion may represent an immune reaction to infection (Ali and Mahmoud, 1993).

The microscopic changes in the heart were only congestion of blood vessels; similar lesion was described by Miyashiro et al. (2007), and Ali and Mahmoud (1993), associated with *P. multocida* and *C. perfringens* infection.

The different lesions found in the examined organs in our opinion may caused by the toxin of the *P. multocida* and the sever lesions found in mixed infected cases may resulted from double action of *P. multocida* and *C. perfringens* toxin.

From this study it is concluded that *P. multocida* and *C.
*Clostridium perfringens* infection among sheep in Sharkia Governorate farms constitute a major problem and need intensive precaution and preventive measures including; application of good hygiene and management in animal farms, application of allowed vaccination programs, feeding animals with balanced ration, and raising the immune status of the animals. Among methods used in diagnosis of *Pasteurella* ELISA was more efficient. *P. multocida* and *C. perfringens* infection could be diagnosed histopathologically and the histopathological changes were valuable in studying the severity of the infection.

**REFERENCE**


Center for Food Security and Public Health (2004): OIE institute for International Cooperation in Animal Biologics; epsilon toxin of *Clostridium perfringens*.

Center for Food Security and Public Health (2005): OIE institute for international cooperation in animal biologics, hemorrhagic septicemia.


دراسات بكتيريولوجية وباثولوجية لمعرفة أسباب نفوق الأغنام بمزارع محافظة الشرقية

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قسم البكتریولوجی - معهد بحوث صحة الحيوان - الدقی
قسم الباثولوجیا - معهد بحوث صحة الحيوان - الدقی

الملخص العربي

أجريت هذه الدراسة على بعض مزارع الأغنام بمحافظة الشرقية والتي لوحظ بها زيادة نسبة النفوق وتصل من 2% إلى 12%, ويلاحظ فيها أعراض تنشأ بها بينما في بعض المزارع الأخرى يصاحبها أعراض أشبه.

تم تجميع عينات الفحوص المعملية وتضمن عينات من الحيوانات الحية السليمة ظاهرية والمرضية والمبتذلة أضطراريا والناقدة حديثا وتتضمن العينات مسحات أنفية وعينات سيرم وعينات أنسجة الفحوص البكتيرولوجي الروتيني وأختبار الألزاء والفحوص الباثولوجي.

أظهرت الفحوص البكتيرولوجيّة عن أصابة الأغنام بـ ميکروب الباستيريلا ملتوسیدا ومیکروبایت کولستریدم بیرفیزنس وذلک في بعض المزارع، وتم تسجيل التغيرات الباثولوجيّة المصاحبة في كل من الرئة، الكبد، الكلى والجلد والجذور في الأمعاء والقلب.

ومن هذه الدراسة يتضح أن الحدوى بميكروبیات الباستیریلا ملتوسیدا والکولستریدم پیرفیزنس تمثل مشكلة حقيقة لابد من أخذ الإجراءات الوقائية للتغلب عليها وتتضمن: تطبيق الإجراءات الصحية والوقائية بمزارع الأغنام، تطبيق برامج التحصينات بانتظام، تقديم العلاج المناسبة، زيادة مناعة الحيوانات.

وقد أثبتت الدراسة أن اختبار الألزاء كان أكثر حساسية من الطرق التقليدية في تشخيص الباستيریلا ملتوسیدا. وأن الفحوص الباثولوجیة فعالة في تشخيص المرض ودراسة مدى ضراوة الحدوى.

المقدمون:

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