

Microbiological study of Otitis externa in Sheep in Diwaniya City

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Abstract

In this study, twenty eight Awassi sheep suffering from otitis externa were examined for isolation and identification of bacterial infections. The study showed 53.6% of the sheep were positive for bacterial isolates. The results showed that *Pseudomonas aeruginosa* was the most common bacteria (39,1%) followed by *Staphylococcus aureus* (26%) , *Mannheimia haemolytica* and *Staphylococcus epidermidis* (13%) for each, while *E.coli* and *Streptococcus* spp. were less in common (1%) for each. Sensitivity tests of these isolate were studied and show highly sensitivity to ciprofloxacin and norfloxacin and highly resistant to Ampicillin.

Introduction

Otitis externa is a common disease in Cattle, Pigs and small animals (1, 2) but it is susceptible in lambs (3, 4). Otitis externa is an inflammation of the outer ear and ear canal characterized by an inflammation of the epithelium of the external auditory meatus (5, 6). Clinical signs such as exudates in conjunction with the isolation of bacterial species in large number are significance in most cases and may indicate the presence of pathogen (7, 8). Otitis externa has a multifactorial etiology and bacteria

play an important role in otic disease (4,5). Most of the bacteria incriminated in ear infections include *Staphylococcus* spp., *Pseudomonas* spp., *E.coli* , *Mannheimia haemolytica* and *Proteus* can be recovered occasionally (9,10). In Iraq, there are little studies on the Otitis externa in sheep; therefore the purpose of this study was to determine the bacterial agents that cause Otitis externa in sheep and its sensitivity to antibiotic.

Material and Methods

Sterile cotton swabs were used for collection of specimens from 28 animals suffered from Otitis externa (auricular discharge , weakness, cough, bilateral nasal discharge) and transported to the laboratory. All specimens obtained were cultured for isolation and identification of the bacteria on the following media: -

1. Blood agar.
2. Mac Conkey agar.
3. Chocolate agar.
4. Peptone water.
5. MR-VP media.

6. Triple sugar iron.

7. Urea medium.

8. Muller –Hinton ager.

The reagents used for identification:-

1. H₂O₂ (catalase test)

2. 1% tetra-methyl paraphenyl diamine dihydrochloride (oxidase test).

3. Kovac's reagent (indole test).

4. Gram's stain.

5. Antibiotic disc.

Bacteria isolates were identified according to Quinn *et al* (12).

Results and Discussion

A total of 28 Awassi sheep were suffered from Otitis Externa (auricular discharge, weakness, cough, bilateral nasal discharge) were enrolled in this study. The results showed that 15 (53.6%) animals were

infected with bacterial species. Twenty three bacterial isolates were isolated from 15 specimens according to biochemical tests (Table 1).

Table (1) Biochemical reactions characteristic of bacterial species isolates

Bacterial isolates	Catalase production	Oxidase production	Indole production	MR reaction	Vp reaction	Urease test
<i>Pseudomonas aeruginosa</i>	+	+	-	-	-	+
<i>Staphylococcus aureus</i>	+	/	/	-	+	±
<i>Mannheimia haemolytica</i>	/	+	-	/	/	-
<i>Staph. epidermidis</i>	+	-	/	/	/	+
<i>Escherichia coli</i>	+	-	+	+	-	-
<i>Streptococcus spp.</i>	+	-	/	/	/	-

As it shown in Table (2) *P.aeruginosa* were the predominant bacteria 9 (39.1%) followed by *S.aureus* 6(26%) and *Manheimia haemolytica* 3 (13%)

,*S.epidermidis* 3(13%) while *E.coli* and streptococcus spp. were less common 1(4.35%) for each.

Table (2) Number and percentage of bacterial isolates from ear canal

Bacterial species	Number of isolates	%
<i>Ps. aeruginosa</i>	9	39.13
<i>Staphylococcus aureus</i>	6	26.08
<i>Staph. epidermidis</i>	3	13.04
<i>M.haemolytica</i>	3	13.04
<i>Escherichia coli</i>	1	4.35
<i>Streptococcus spp</i>	1	4.35
Total	23	99.99

The results confirm the results obtained by (4, 7, 9 and 11) who reported that *Pseudomonas* was the predominant microorganism followed by *S.aureus*.

Antimicrobial susceptibility tests were determined by Kirby-Baur disc diffusion method (13) .Table (3) showed the results of sensitivity test of the bacterial isolates.

Table (3) antibiotic sensitivity results of the bacterial species

Bacterial species	<i>Ps. aeruginosa</i>	<i>S. aureus</i>	<i>S.epidermidis</i>	<i>M.haemolytica</i>	<i>E. coli</i>	<i>Streptococcus</i>
Ampicilin	R	R	R	S	R	S
chloramphenicol	R	R	R	R	R	S
Erythromycin	R	S	S	S	R	S
gentamicin	R	S	S	S	S	S
norfloxacin	S	S	S	S	S	S
ciprofloxacin	S	S	S	S	S	S
vancomycin	R	R	S	R	R	S

It was found that *P.aeruginosa* was highly resistant to ampicillin chloramphenicol and erythromycin but showed highly sensitivity to ciprofloxacin and norfloxacin which confirm the results obtained by (14, 15).*S.aureus* showed highly sensitivity to ciprofloxacin and norfloxacin and erythromycin but was highly resisted to ampicillin and chloramphenicol. All isolates were highly sensitive to Ciprofloxacin & norfloxacin because of the ability of these antibiotics to inhibit the bacterial DNA – gyrase which is very important in stationary growth phase of the bacteria (15).A little is

known about otitis externa in sheep compared with the information available on cattle and horses and many factors can predispose sheep to otitis externa including the anatomic orientation of the ear canal itself .The vertical canal slopes medially into horizontal orientation on the outside of the tympanic membrane .This prevents drainage of debris leads to accumulate it (3).Many bacterial species commonly inhabit the ear canal and can become secondary opportunistic invaders when conditions are favorable (5, 6, 9, and 16).

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دراسة مايكروبيولوجية عن التهاب الاذن الخارجية في الضأن العواسية في محافظة القادسية

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الخلاصة

تم في هذه الدراسة فحص ٢٨ رأساً من الضأن العواسية تعاني من التهاب الاذن الخارجية مايكروبيولوجيا حيث تم عزل وتشخيص البكتريا بنسبة (٥٣.٦%) من مجموع العينات المأخوذة. كما بينت الدراسة شيوع بكتريا *Pseudomonas aeruginosa* بنسبة (٣٩.١%) تتبعها *Staphylococcus aureus* بنسبة (٢٦%) ثم *Mannheimia haemolytica* و *Streptococcus spp* و *E.coli* بنسبة (١٣%) لكل منهما بينما كانت بكتريا *Streptococcus spp* و *E.coli* اقلها شيوعاً بنسبة (١%) لكل منهما. كما اظهرت نتائج فحص الحساسية للمضادات الحيوية لجميع العزلات البكتيرية حساسية عالية للمضادين الحيويين Ciproflouxacin و norflouxacin مقاومة عالية للمضاد Ampicillin .