Investigation for bacterial causes of superficial abscesses in Iraqi goats

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Abstract

The aim of the study was to investigate the bacterial causes of superficial abscesses in goats. Thirty pus samples were collected out of 560 examined goats from many flocks. Results recorded the incidence ratio of superficial abscess in goats were 5.3%. In which the distribution ratios in body were; head and neck 60.0%. abdomen, chest and sternum 20.0%, udder 10%, testis 6.66% and inter digital clefts 3.33% from total superficial abscesses. Forty seven bacterial strains were isolated from thirty superficial abscesses cases, including: *Staphylococcus* spps. 34.04%, *Corynebacterium* spps. 19.14%, *Streptococcus* spps. 14.89%, *Arcanobacterium pyogenes* 14.89%, Enterobacteriaceae 10.63%, *Pseudomonas* spps. 4.25%, and *Fusobacterium* spps. 2.12%. The study founded one superficial abscess which gave negative result for bacterial culturing with ratio 3.3%.

Key words: superficial abscesses, goats, gram positive bacteria, gram negative bacteria

التحري عن المسببات الجرثومية للخراجات السطحية عند المعز العراقي

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الخلاصة

هدفت الدراسة الى تشخيص المسببات الجرثومية للخراجات السطحية عند المعز العراقي ، جمعت 30 عينة خراج من فحص 560 رأس ماعز من عدة قطعان. أظهرت الدراسة ان نسبة حدوث الخراجات السطحية في المعز كانت 5,3%. وقد توزعت الخراجات على مناطق الجسم بنسب مختلفة وكالآتي: منطقة الرأس والرقبة 60%، منطقة الصدر والبطن والقص 20%، منطقة الضرع 10% ، الخصى 6,66% ، بين الأضلاف 3,33%. تم عزل 47 عترة جرثومية من 30 عينة خراج وقد كانت انواع ونسب عزل الجراثيم من الخراجات ، جنس العنقوديات (34,04%) ، جنس الوتديات (19,14%) ، جنس العقديات (14,89%) ، الشعية المقيحة (14,89%) ، المعويات (10,63%) ، جنس الزوائف (4,25%) ، جنس المغزليات (2,12%). كما اشارت الدراسة الى وجود عينة قيح واحدة سالبة للزرع الجرثومي وبنسبة 3,33%.

الكلمات المفتاحية: الخراجات السطحية ، الماعز ، جراثيم ايجابية الكرام ، جراثيم سلبية الكرام

Introduction

Abscess is a focal purulent inflammation; occur due to immune response for pathogenic causes, the pus formed from degeneration and necrosis of tissue by macrophages enzymes. The pus surround by purulent layer, granulomatous layer and fibrous layer (1, 2). There are many bacterial causes of superficial abscess, while the most important were: *Corynebacterium* spps., *Arcanobacterium pyogenes*, *Staphylococcus* spps., *Streptococcus* spps., *Fusobacterium* spps., Enterobacteriaceae, *Pseudomonas aeruginosa* (3, 4, 5, 6). *Corynebacterium* spps.: are small, pleomorphic Gram positive bacteria which occur in coccoid, club and rod, they arranged singly, in palisades of parallel cells and in angular clusters resembling Chinese letters, it give positive result in catalase test and negative result in oxidase test, produce beta-hemolysis on blood agar, not growth in MacConkey agar. *Arcanobacterium pyogenes*: are Gram

positive bacteria, non-motile, non-spore forming, produces characteristic hazy hemolysis along streak lines after aerobic incubation for 24 hours, pin-point colonies become visible after 48 hours, it gives negative result in catalase test and nitrate reduction test. *Staphylococcus* spps.: are Gram-positive cocci, occur in irregular clusters resembling bunches of grapes, most staphylococci are facultative anaerobes and catalase-positive, oxidase-negative, non-motile, non- spores forming. *Streptococcus* spps.: Gram-positive cocci appear as paired or chains, facultative anaerobes, non-motile, grow on MacConkeyagar as red pin-point colonies, give negative result in catalase test. *Fusobacterium* spps.: Gram-negative bacteria, anaerobic, non-spore-forming, required enriched media for growth. *Enterobacteriaceae:* are Gram-negative rods, facultative anaerobes, oxidase-negative, catalase-positive, reduce nitrate to nitrite, ferment glucose growth in MacConkey agar. *Pseudomonas aeruginosa*: species return to Enterobacteriaceae, its Gram-negative rods, obligate aerobes, growth well in MacConkey agar, most isolates are oxidase-positive and catalase positive, production of diffusible pigments (7).

Materials and methods

The study was conducted in many flocks, which included 650 goats and samples examined in microbiology laboratory In college of Veterinary Medicine, University of Tikrit. Thirty samples were collected after hair removing and disinfecting the area, then samples dragged by sterile syringe and cultivation in nutrient broth (with 10% horse blood serum) at 37°C for 4 days.

First isolation:Which applied by sub culturing from nutrient broth into 3 petri dishes: 1st MacConkey agar cultivation aerobically, 2 2d blood agar cultivation aerobically and 3rd blood agar cultivation anaerobically at 37° C for 4 days.

Primary identification of bacteria: By using gram stain in to G^{+ve} cocci, G^{+ve} bacilli and G^{-ve} bacilli.

Secondary identification of bacteria: Which applied by using selective media (Mannitol Salt Agar and Crystal Violet-Azide Blood Agar), type of blood hemolysis, growth aerobically and/or anaerobically, produce pigment, spore forming, ability to growth in MacConkey agar and biochemical tests (catalase test, oxidase test, nitrate reduction test,H_2s production test and urease test) (2, 7, 8).

Results

This study applied on many goats flocks, in which 560 goats the total examined goats of different ages. 30 goats of them were suffering from superficial abscess with incidence ratio 5.3%. The study showed that the ratios of superficial abscess distribution in body were; head and neck 60.0% (18/30), abdomen, chest, and sternum 20.0% (6/30), udder 10% (3/30), testis 6.66% (2/30) and inter digital clefts 3.33% (1/30) (Table 1).

Table 1: Distribution ratio of abscess on body regions

Site of abscess	Number of abscess	Ratio
Head & neck	18	60.00%
Abdomen, chest & sternum	6	20.00%
Udder	3	10.00%
Testis	2	6.66%
Inter digital clefts	1	3.33%
Total	30	100%

Table 2: Types of bacteria isolated from abscess with its ratio

Type of isolate	Number of isolate	Ratio
Staphylococcus spps.	16	34.04%
Corynebacterium spps.	9	19.14%
Streptococcus spps.	7	14.89%
Arcanobacterium pyogenes	7	14.89%
Enterobacteriaceae	5	10.63%
Pseudomonas spps.	2	4.25%
Fusobacterium	1	2.12%
Total	47	100%

Forty seven (47) strains were isolated from 30 pus samples.The type of bacterial isolates and its ratio, as following: *Staphylococcus* spps. 34.04% (16/47) *Corynebacterium* spps. 19.14% (9/47), *Streptococcus* spps. 14.89% (7/47), *Arcanobacterium pyogenes* 14.89% (7/47), Enterobacteriaceae 10.63% (5/47), *Pseudomonas* species 4.25% (2/47), and *Fusobacterium* spps. 2.12% (1/47), from total bacterial isolates (Table 2). The study refers to presence one superficial abscess which gives negative result of bacterial culture with ratio 3.3% from total abscess cases.

Discussion

The study revealed that high distribution ratio of superficial abscess in head and neck region. That's may be due loss of hair in this area, during goats crowding to mangers, during combats or due to abrasions by cow catcher, this observation is in agreement with (1). In presence study many types of bacteria are isolated, but the main species are *Staphylococcus*, and *Corynebacterium* spps. This will agree with (9-11). Also, this study reported only one isolate returned to Fusobacterium genus from inter digital clefts abscess. This will agree with (4) whom revealed that main causes of inter digital clefts abscesses are Fusobacterium genus. The study showed mix bacterial strains detected from same pus. That result may be due to multi infection causes, contamination of samples during collection or the abscess occur by penetration of contamination things (5). Pus samples negative to bacterial culture, that's may be due to role of immunity specific cellular immunity, that phagocytosis and killed the causative agents (12).

References

1-Goda ASA, Mahmoud MA, Osman W A, Ziada NA, Moussa IM (2007) Molecular characterization of *Corynebacterium pseudotuberculosis* isolated from sheep by random amplified polymorphic DNA polymerase chain reaction (RAPD-PCR). BS. VET. MED. J. 17, (1): 39-49.

2-Gezon H M, Bither H D, Hanson LA, Thompson JK (1991) Epizootic of external and internal abscesses in a large goat herd over a 16-year period, JAVMA, 198: 257-263.

3-AL-Hawala S (2012) Investigation for bacterial causes of superficial abscesses at awassi sheep in eastern region of Syria. Msc.Thesis.Vet. Med. Coll. ALbaath.Univ.

4-Radostits OM, Henderson JA, Blood DC, Arundel JT, Gay CC (2007) "Veterinary Medicine: A Textbook of the Diseases of Cattle, Sheep, Pigs, Goats, and Horses". 11th Ed; W.B. Saunders Elsevier. UK. Chapter 18, Pp: 966-993.

5-Pedro NA, Szyfres B (2001) Zoonosis and Communicable Diseases Common To Man and Animals, In; Bacteriosis Infections and Mycoses. Third Edition, Scientific and Technical Publication, P:191-262.

6-StauberE, Armstrong P, Chamberlain K (1973) Caseous lymphadenitis in a White-Tailed Deer. Journal of Wildlife Diseases. 9: 56-57.

7-Quinn PJ, Markey BK, Carter ME, Donnelly WJC, Leonard FC (2002) Veterinary Microbiology and Microbial Disease. 1st ed. Blackwell Science Ltd; London. Pp: 163-167.

8-Lloyd, S (1994) Caseous lymphadenitis in sheep and goats. Practice.16: 24-29

9-Paton MW (2010) The Epidemiology and Control of Caseous Lymphadenitis in Australian sheep flocks. Grad Cert Animal Welfare.

10-North R (2004) Goat health; caseous lymphadenitis; cheesy gland, Ag fact A7.9.8, second edition.

11-Tadayon RA, Cheema AH, Muhammed SI (1980) Microorganisms associated with abscesses of sheep and goats in the south of Iran, Am J Vet Res, 41:798-802.

12-Babiker A, El Sanousi S (2004) Effects of fattening on the occurrence of sheep abscess disease; Morel's Disease Deutscher Tropentag, pp:5-7.