

INFECTIOUS KERATO-COUNJUNCTIVITIS IN LOCAL BUFFALOES BREEDS IN MOSUL, MOSUL- IRAQ

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ABSTRACT

The objective of this study was to investigate infectious keratoconjunctivitis in local buffaloes breed in Mosul (Mosul-Iraq). The study was conducted on (360) local buffaloes breed of different ages and both sexes. Animals were belong to different privet farms in Mosul area, and reared indoor or grazed during the day light. Result revealed that out of (360) animals, (80) animals have been exhibited the clinical sings of keratoconjunsctivitis, with a prevalence rate of (22.2%). Diseased animals show sings of, conjunctival hyperemia, serious, mucoid and/or purulent ocular secretions, photophobia, blepherospasim, congregation of flies on the eyes, edematous eyes anxiety, and corneal opacity. Results were also indicated different causative agents which were responsible for the disease, *Morexella spp.*, *Corynebacterium spp.*, *Listeria spp* and *E.coli.* being the most important and common isolated, moreover *Staphylococcus spp.*, *Pseudomonas spp.*, *Niessleria spp.* *Actinobacillus spp.*, *Klebseilla spp.*, and *Proteus spp.*, were also detected.

INTRODUCTION

Infectious keratoconjunctivitis is a highly contagious ocular infection affecting domestic and wild ruminants, and have major economic importance (1, 2). The condition is caused by various bacteria and is characterized by epiphora, conjunctival inflammation, pigmental areas on the cornea, photophobia, blepherospasm, which might terminated by corneal ulceration and even panophthalmia (3). The disease is common in dairy herds, reducing milk production and body weight, however is rarely cause death (4, 5). The disease either transmitted by direct contact with infected materials from one animal to another or by indirect transmission of conjunctival exudates by flies (6). A number of infectious agents have been reported to cause keratoconjunctivitis in ruminants specially cattle, such as *Rhikettsiae*, *Chlamydia*, Viruses, *Mycoplasma spp.*, *Neisseria catarrhalis* and *Moraxella bovis* which identified as the main causative agent and one of the more pathogenic and enormous economic impact, however, other factors including ultra violate light, concurrent diseases status, mechanical trauma and other ocular bacterial organisms may predispose to the infection (7).

In buffaloes the disease were reported by (2,4,8), whom published literatures on various aspects of clinical cases of infectious keratoconjunctivitis, which observed throughout the year, but its incidence might increase during summer and autumn months. Studies of infectious keratoconjunctivitis in buffaloes in Mosul area (Mosul-

Iraq) are very limited and little information had been provided, therefore the present work were done to investigate clinical reactions and causative agents in buffaloes suffering from keratoconjunctivitis.

MATERIALS AND METHODS

Animals:

360 buffaloes of different ages and both sexes (Represent 5 herds), belong to different privet farms in Mosul area (Mosul-Iraq) were examined clinically and bacteriologically, these animals either reared indoor or grazed during the day light .

Samples and bacteriological examination:

Samples were collected using separate sterile swabs by inserting into the conjunctival sac of animals showed symptoms of keratoconjunctivitis, gently rolled and then inoculated into nutrient broth, transported to laboratory as soon as possible ,incubated for 2-6 hours at 37°C then streaked on blood and MacConkey agar and incubated for 24-48 hours at 37°C. Isolates were identified (using Gram stain method and biochemical analysis) according to standard laboratory methods described by (9). Appendix (1)

RESULTS

Results revealed that 80 out of 360 animals were found infected with keratoconjunctivitis with prevalence rate of (22.22%). Diseased animals showed, conjunctival hyperemia (83.75 %), (photo. 1), serious, mucoid and/or purulent ocular secretions (52.5 %) (photo. 2) photophobia (41.25%), blepherospasim (33.75%), congregation of flies on the eyes (31.25%), edematous eyes (22.5%), anxiety (18.25%), and corneal opacity (8.75%) (photo. 3) Table (1).

Table (1) Clinical sings of infected buffaloes with keratoconjunctivitis

Clinical sings	Number of animals	%
Conjunctival hyperemia	67	83.75
Serious, mucoid and / or purulent ocular secretions	42	52.5
Photophobia	33	41.25
Blepherospasim	27	33.75
Congregation of flies on the eyes	25	31.25
Edematous eyes	18	22.5
Anxiety	15	18.25
Corneal opacity	7	8.75



Photo (1): Conjunctival hyperemia.

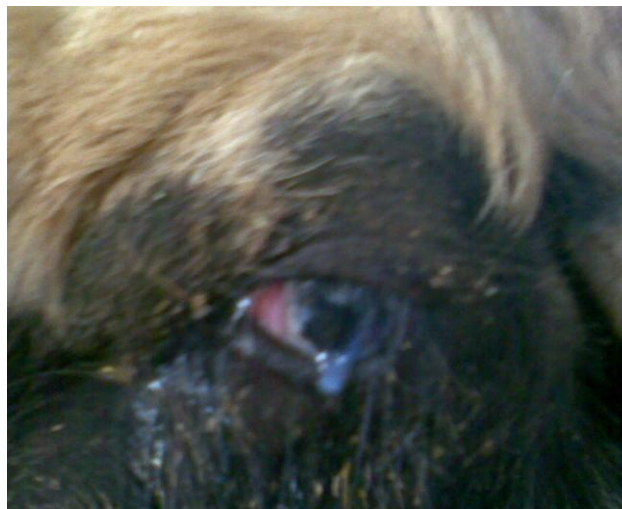


Photo (2): Serious and /or mucoid ocular secretions



Photo(3): Corneal opacity

Results of bacterial isolation indicated that (63) isolates of different bacterial organisms were detected includes, *Moraxella spp.* (25.39%), *Corynebactrium spp.* (19.04%), *Listeria spp.* (14.28), *E. coli* (11.11%), moreover *Staphylococcus spp.*, *Pseudomonas spp.*, *Niesseria spp.*, *Actinobacillus spp.*, *Klebsiella spp.*, and *Proteus spp.* were detected in (9.52%, 9.52%, 6.34%, 1.58%), respectively. Table (2).

Table (2): The bacterial isolates of infected buffaloes with keratoconjunctivitis

Species	Number of isolates	%
<i>Moraxella spp.</i>	16	25.39
<i>Corynebacterium spp.</i>	12	19.04
<i>Listeria spp</i>	9	14.28
<i>E. coli</i>	7	11.11
<i>Staphylococcus spp.</i>	6	9.52
<i>Pseudomonas spp</i>	6	9.52
<i>Niesseria spp.</i>	4	6.34
<i>Actinobacillus spp.</i>	1	1.58
<i>Klebsiella spp.</i>	1	1.58
<i>Proteus spp.</i>	1	1.58
Total	63	100

Appendix (1) Biochemical analysis of the bacterial isolates

Species	NO.	Urease	Citrate	M.red	V.proskur	Indol	Oxidase	Catalase	Nitrate	Isolated Identification
<i>Morexlla</i>	16	V	-	-	-	V	+	+	V	G ⁻ Diplobacilli coccal shape
<i>Corynebactrium</i>	12	V	-	-	-	-	-	V	-	G ⁺ V shape coccobacilli
<i>Listeria</i>	9	-	-	+	V	-	V	+	V	G ⁺ Coccobacilli,palisades
<i>E.coli</i>	7	-	-	+	-	+	-	+	+	G ⁻ Small bacilli
<i>Staphylococcus</i>	6	+	V	V	-	-	-	-	+	G ⁺ Grape like clusters
<i>Pseudomonas</i>	6	V	V	-	-	-	+	+	+	G ⁻ Bacilli
<i>Niesseria</i>	4	-	-	V	-	-	+	+	V	G ⁻ Small bacilli
<i>Actinobacillus</i>	1	+	V	-	-	-	-	V	+	G ⁻ Coccobacilli ,multiforms
<i>Klebsilla</i>	1	+	+	-	+	-	-	+	+	G ⁻ Small bacilli
<i>Proteus</i>	1	+	V	+	-	+	-	+	+	G ⁻ Small bacilli

DISCUSSION

The study revealed that prevalence of infectious keratoconjunctivitis in local buffaloes breed in Mosul (Mosul-Iraq) were (22.22%), nearly same results were also indicated by (4), lower rate were recorded previously by (8, 10) who recorded prevalence rate (16.9%), and mention that the variation of these rates may be attributed to the animal susceptibility, in addition to probability of exposure which governed by animal housing and management system, season and localities, thereby susceptibility were increased through some factors such as high stocking density, close confinement of animals to barns, movement of animals through dusty yards, the presence of flies which might consider as the main transmitter, movement of stock through long grasses, ultraviolet solar radiation, eye lid pigmentation and the presence of other pathogens.

The diseased animals exhibited different clinical sings of keratoconjunctivitis, which were in agreement with those described by (1, 11, 12). The pathogenesis of most microorganisms responsible for keratoconjunctivitis, specially *M. bovis*, involve the expression of pili that enables the bacterium to adhere to the corneal epithelium and liberation of cytotoxin that lyses corneal epithelial cells and host neutrophils (13, 14, 15). Moreover, (11) added that the Microscopic corneal erosions are present within 12 hours of infection and occur at this time in the absence of a significant inflammatory response. An inflammatory reaction will occur several days post infection and results in enlargement of the corneal ulcers with deeper stromal

involvement, corneal edema, and corneal neovascularization, the lesions are localized in the eye and there is no systemic infection.

It was evident that the clinical form of keratoconjunctivitis governed by the incriminated microorganism, the course and secondary bacterial infection (16). Keratoconjunctivitis may also initiated in the presence of *Listeria spp.*, *Corynebacterium spp.* and *M. bovis* by aid of some contributory factors like solar irradiation, dust and winds, then become sever and prolonged and may be complicated by secondary bacterial infection (17).

Ultraviolet (UV) light is especially a problem for cattle and buffaloes lacking pigmentation around their eyes, lack of pigmentation allows increased UV radiation to sensitize the eye, resulting in inflammation and subsequent infection (4, 8, 18). Flies not only serve as irritants as they feed on secretions from the eye, but they also serve as a means of transmitting microorganisms from infected to non-infected animals, furthermore face flies can remain infected with *M. bovis* up to three days following feeding on infected materials, and under experimental conditions disease transmission is uncommon without the presence of face flies and is common with flies present (19).

In current study bacteriological examination of swabs from diseased animals yielded several species of bacteria in which *Moraxella spp.*, *corynebacterium spp.*, *Listeria spp.* and *E. coli* were the most common isolates, similar findings were also reported by (10, 20, 21, 22). Seham and Mohammed (23) isolated *Staphylococcus* and *E. coli* from infected calves and showed that they were the predominant organisms responsible for infectious keratoconjunctivitis, they further reported that *Staphylococcus* occurred more frequently and severely than mildly affected eyes, whereas (24) isolated more than 14 species of both gram positive and negative microorganism from bovine eyes exhibited clinical sings of keratoconjunctivitis and they considered that *M. bovis*, *Corynebacterium bovis*, *Niesseria catarrhalis* and *Chlamydiae spp.* were the most prominent causative agents for keratoconjunctivits in cattle.

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التهاب الملتحمة والقرنية المعدي في الجاموس المحلي في الموصل (الموصل- العراق)
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الخلاصة

اجريت هذه الدراسة للتحري عن التهاب الملتحمة والقرنية المعدي في الجاموس المحلي في مدينة الموصل (الموصل- العراق). تم فحص 360 راسا من الجاموس المحلي وباعمار مختلفة ومن كلا الجنسين تعود الى حقول اهلية خاصة ذات الرعي الداخلي او الخارجي وبشكل محدود. اوضحت نتائج الدراسة ان (80) راسا من الحيوانات كانت تعاني من التهاب الملتحمة والقرنية المعدي وبنسبة انتشار 22.2 (%). اظهرت الحيوانات المصابة علامات سريرية تمثلت باحمرار ملتحمة العين مع افرازات مصلية او مخاطية او قيحية احيانا، رهاب الضوء، غمز الاجفان، تجمع الذباب حول العيون، وذمة العيون، القلق، وعتامة القرنية. كما اوضحت الدراسة ان هناك العديد من الجراثيم تم عزلها من عيون الحيوانات المريضة كان من اهمها اجناس جراثيم الموريكزيبلا، الوتديات، الليستيريا والايشيريشيا القولونية والتي عدت من المسببات المهمة والاكثر

شيوعا فضلا عن عزل مسببات جرثومية اخرى وينسب اقل تمثلت بأجناس جراثيم المكورات العنقودية والزوائف والنايسيريا والعصيات الشعية والكلبيسيلا والمتقلبات.

REFERENCES

- 1-Brown MH, Brightman AH, Fenwick BW, Rider MA.. Infectious bovine keratoconjunctivitis: a review. J Vet Intern Med. 1998 .12(4):259-66.
- 2-Rajesh,K., Suresh,K. and Syaama Sundar,N. Infectious Bovine Keratocoujunctivitis ,clinical and therapeutic aspects.2009.Buffalo Bulletin .8 (3)110-112
- 3-Murat K., Kadir S.G.M.,Ahmet .O. Evaluation of Various Antibiotic Treatments in Calves with Infectious Bovine Keratoconjunctivitis. 2006,Turk. J. Vet. Anim. Sci. 30 553-559
- 4-Al-Gaabary,MH.,Rafik,JJ.,Osman,SA.Comparative study of infectious bovine keratoconjunctivitis (IBK)in cattle and buffaloes.2008.13th Sci.Cong.Fac.Vet.Med.Assiut.Univ.Egypt.
- 5-Slatter, DH. , Edeards ,ME. , Hhwkins, CD .. WILCOX,GE. A national survey of the clinical features, treatment and importance of infectious bovine keratoconjunctivitis.2008.Aust.Vet.J.59(3)69-72.
- 6-Bedford, P G C. Infectious bovine keratoconjunctivitis. Vet. Rec. 1976. **98**, 134-135.
- 7-John A. A, Phillip Q. Spinks, L M. B and Lisle W.G. *Moraxella bovoculi* sp. nov., isolated from calves with infectious bovine keratoconjunctivitis. Int J Syst Evol Microbiol .2007.**57** 789-795.
- 8-Al-Gaabary,MH and Ammar,KM. Infectious bovine keratoconjunctivitis,IBK,In Egyptian buffaloes.8th Sci.Con.1998.Fac.Vet.Med.Assiut University.
- 9-Quinn, P. J., Carter, M. E. , Markey, B. K and Carter G.R. (2004). Clinical Veterinary Microbiology .Mosby,Elsevier Limited.London.
- 10-Yeruham,I.,Perl,S and Elad,D.Infectious bovine keratoconjunctivitis and lymphofollicular hyperplasia of the third eyelid in heifers,J.Vet.Med.2001.Series B 48(2)137-141.
- 11-Radostitis, OM., C.C. Gay, D.C. Blood and K.W. Hinchliff, 2007. Veterinary Medicine. A text book of the diseases of cattle, sheep, goats and horses.9th ed, WB saunders Co.pp:994-995.
- 12- Sayed ,AM.,Abd EL-Fattah,AM and Manna,AM.Epidemiological view of infectious keratoconjunctivitis in calves :clinical symptoms ,microbiological examination and treatment .Assiut.Vet.Med.J.1995.33(65)100-104.

- 13-Moore,LJ and Rutter,JM.Attachment of *Moraxella bovis* to calf corneal cells and inhibition by anti serum .Aust.Vet.J.66:39-42.
- 14-Clinkenbeard,KD and Thiessen,AE. Mechanism of action of *Moraxella bovis* hemolysin.Infect.Immun.1991.59:1148-1152.
- 15-Beard ,MK and Moore.LJ.Reproduction of bovine keratoconjunctivitis with a purified hemolytic and cytotoxic fraction of *Moraxella bovis*.Vet.Microbiol.1994.42:15-33.
- 16-Akerstedt,J and Hofshagen,M. Bacteriological Investigation of Infectious Keratoconjunctivitis in Norwegian Sheep. Acta vet. scand. 2004, 45, 19-26.
- 17-Thakur, D.K., M.K. Jha, M. Shaheen and B.K. Roy.. An outbreak of Infectious keratoconjunctivitis in caprine and bovine in Ranchi. Indian Vet. J., 1996.73(7): 770-771.
- 18-Baptista,PJHP.Infectious bovine keratoconjunctivitis :A review .Br.Vet.J.1979.135:225-242.
- 19-Gerhardt,RR.,Greene,WH.,Smith,PC.The role of face flies in an episode of infectious bovine keratoconjunctivitis .JAVMA.1982.180(2)399-401.
- 20-Takele ,GM and Zerihun ,A.Epidemiology of infectious keratoconjunctivitis in cattle in south –east Ethiopia .J.Vet.Med.2000.Series .A.47(3)169-173.
- 21-Hasso,SA.,Al-Jubori,KO and Abdul-Hussain,I.Isolation of *Moraxella bovis* from affected eyes of calves and cows.Iraq.J.Vet.Sci.2001.14(1)57-60.(In Arabic).
- 22-Mcconnd,CS.,Shum.L and House,JK.Infectious bovine keratoconjunctivitis antimicrobial therapy .Aust.Vet.J.2007.85(1-2)65-69.
- 23-Seham, Aly, M. and M.A. Mohammad. 1995.Bacteriological studies of Infectious keratoconjunctivitis in dairy calves. Assiut Vet. Med. J.1995. 32(64): 88-95.
- 24-Okumus.Z.,Kirecci,E.,Kisa,F and Kaya,M.Screening conjunctival bacterial flora and antibiogram test in cattle .JAVA.2005.4(10)845-847.