THE PREVALENCE OF *MORAXELLA BOVIS* IN CLINICALLY NORMAL CATTLE EYES: ITS SIGNIFICANCE TO INFECTIOUS BOVINE KERATO-CONJUNCTIVITIS

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ABSTRACT

In a study to determine the prevalence of *Moraxella bovis* in clinically normal cattles eyes in Maduguri area of Nigeria, 35 adult cattle (70 eyes) and 25 calves (50 eyes) were sampled. Three each of the adult and young cattle making a total of 6 (5%) were positive for *M.bovis* (the aetiological agent of infections bovine Keratoconjunctivitis) out of the 120 eyes sampled. *Branhamella catarrhalis, Branhamella mucosa* and *Escherichia coli* were each isolated respectively, from 2 (1.6%) of the 120 samples. The other bacterial species isolated were *Bacillus* (5;4.2%), *Corynebacterium* (17; 14.2%), *Streptococcus* (9; 7.7%) and *Staphylococcus* (21/17.5%), could be regarded as commensals. The epidemiological implications of finding *M. bovis* in clinically normal cattle eyes are discussed.

INTRODUCTION

Infectious bovine kerato-junctivitis (IBKC) is recognised world-wide as a common condition affecting the eyes of cattle. Various other names have been given to the disease such as pink eye (Scott,1957) and New forest disease (Bedford,1976).

Moraxella bovis is considered the aetiological agent of infectious bovine keratoconjunctivitis (Adinarayanan and Singh, 1961;Pugh and Hughes, 1975). The disease is considered to be of major economic importance to the cattle industry in some parts of the world (Killinger *et al., 1977; Harris et al.,* 1980).

In Nigeria, there appears to be little or no report on the isolation of *M. bovis* from clinically normal cattle eyes,although the prevalence of serum antibodies to *M. bovis* has been reported (Makinde et al., 1985). Therefore, this paper reports on the isolation of *M. bovis* from normal cattle eyes and highlights on the significance of the findings.

MATERIALS AND METHOD

Sources of Samples

Samples were taken from each eye of thirty five (70) samples adult cattle from the Maiduguri cattle market, and twenty five (50 samples) calves in the University of Maiduguri Teaching and Research Farm. The breeds involved were white Fulani, Wadara, Kuri and their crosses.

Collection of Samples

Only eyes which showed no clinical disease (unaffected; grade 0) were sampled.

The upper and lower fornices of the conjunctivae were sampled with a transwab(R) (Medical Wire Equipment, England) containing a sterile transport medium.

Media Cultivation and Identification

After sampling, and on return to the laboratory each swab was immediately streaked onto blood agar plates containing 5% bovine blood. The plates were then incubated at 37°C aerobically for 24hrs, and a further 48hrs for those plates that showed scantly or no growth. Representative

colonies of both gram positive and negative bacteria on each plate were Gram stained, including those that showed typical morphological and cultural characteristics of *Moraxellae or Branhamellae (Neisseriae)* and were further subcultured for purity onto bovine blood agar and reincubated at 37^0c for 24 hr. Other isolatea which included *Bacillus, Corynebacterium, Streptococcus and Straphylococcus* species were indentified to the genus level based on morphology, and routine biochemical and sugar reactions according to the methods of Cowan and Steel (1974).

Colonies culturally resembling *Moraxella and Brahamella* species were further examined fermentatively and also biochemically using catalase, oxidase, litmus milk and the ability to produce haemolysin as described by Mcfaddin (1980) and Bergey (1984). *Moraxella and Branhamella* species were then diferentiated according to the methods of Fraser and Gilmour (1979).

RESULTS

Table I shows the number of gram negative samples isolated from 120 clinically normal cattle eyes. Thirteen gram negative isolates were positive out of the 120 eye samples,of which *M. bovis* was isolated from 6 (5%) of the total eye samples. Of the positives samples for *M. bovis*, 3 (5%) were obtained from calves and the other 3 (5%) was obtained from the adult cattle. All the isolated M.bovis showed typical fermentative and biochemical characteristic of *Moraxella* as decribed by Fraser and Gilmour (1979). *Brahamella catarrhalis* was isolated from 2 (1.6%) of the 120 samples. Two isolates (1.6%) of *Branhamella mucosa* and 1 (0.8%) of *Branhamella pharyngis* were obtained from the 120 samples, whilst *Escherichia coli* was positive in 2 (1.6%) of the total samples.

The gram positive bacterial species also isolated from the 120 samples were Bacillus (5, 4.2%), Corynebacterium (17; 14.2%), Streptococcus (9; 7.5%) and Staphylococcus (21; 17.5%).

DISCUSSION

This study has shown that a variety of micro-organisms exist in cattle eyes similar to the observations of Barber et al (1986). Since *M. bovis* is considered as the aetiological agent of IBKC(Adinarayananand Singh, 1961; Pugh and Hughes, 1975), the isolation of this organism from clinically normal cattle eyes in this study, inducate that these animals may have been recovered carriers following a previous infection. It is also likely that these positive animals may have been in their subclinical stage of the disease (Infectious bovine kerato-conjunctivitis).

Only few isolates (6) of *M. bovis* were recovered from the 120 sample, perhaps because these positive animals had just recently been infected with *M. bovis* prior to sampling, or that local ocular immune reponses might have neutralised the organism in some intected eyes especially the secretory IgA(s), which are known to predominate in affected eyes following infection with *Mbovis* (Pederson and Nansen, 1972; Duncan *et al*, 1972). However, the presence of this organism in cattle eyes indicate that these animals can act as carriers and may constitute a source of infection to other animals in the flock or those newly intoduced, which can lead to new outbreaks or recrudescence of the disease.

The other bacterial species isolated in this study were similar to those of spradbrow (1967) and Wilcox (1970). However, it is not known what role these other organisms play in the pathology of the disease, although they have not been reported to cause ocular disease in cattle (Bergey, 1984). It is also likely that these organisms may act as secondary invaders or commenals in normal or affected eyes.

This study has shown that *M. boyis* can occur subclinically, or in normal cattle eyes with some epidemiological implications. The work reported in this study can be regarded as preliminary, as further work is in progress to monitor infected eyes in some herds by repeated samplings, in order to ascertain the true prevalence of *M.bovis* in these eyes.

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TABLE 1: FERMENTATION AND BIOCHEMICAL CHARACTERISATION OF GRAM-NEGATIVE BACTERIA ISOLATED FROM 120 CLINICALLY NORMAL CATTLE EYES.

Number of Samples	Haem.	Growth on mac.	Oxidase	Catalase	Nitrate	Litmus milk	Liquefaction of Gelatin	Glucose	Maltose	Lactose	Xylose	Identification
5	-	-	+	-	+	NP	-	-	-	-	-	*B. Catarrhalis*
11	-	-	+	+	+	NP	-	-	-	+	-	*B. mucosa*
17	B	-	+	-	-	P	+	-	-	-	-	*B. bovis*
18	-	+	-	+	+	-	+	+	+	+	+	*E. coli*
22	-	-	+	+	-	NP	-	+	-	-	-	*B. pharyngis.*
35	-	+	-	+	+	NP	-	+	+	+	-	*E. coli*
43	B	-	+	+	-	P	+	-	-	-	-	*M. bovis*
44	B	-	+	+	-	P	+	-	-	-	-	*M. bovis*
60	B	-	+	+	-	P	+	-	-	-	-	*M. bovis*
72	-	-	+	+	-	P	+	-	-	-	-	*M. bovis*
36	-	-	+	+	+	AC	-	+	+	+	+	*B. mucosa*
106	+	-	+	+	+	AC	-	-	-	-	-	*B. catarrhalis*
116	-	-	+	+	-	P	+	-	-	-	-	*M. bovis*

Haem = Haemolysis on bovine blood agar
B = Clear zone of haemolysis
Mac = MacConkey agar
\+ = Positive
\- = Negative
P = Peptonization
NP = No peptonization
AC = Acid.

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