BACTERIOLOGICAL ASSESSMENT OF INFLAMED CATTLE LIVERS, WITH SPECIAL VIEW TO HEPATIC ABSCESSES
(With 2 Tables & One Fig.)

By

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التقييم الميكروبيولوجي لالتهابات كبد الحامض
وبنظرة خاصة للخراريج الكبد

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أجري هذا البحث لعزل وتصنيف الميكروبات المسببة لالتهابات الكبد وبصفه خاصة الالتهابات الصديدية أو المصحوبة بخاريجه. مثل ميكروب الفيروس والبكتيريا والجيرموم المسبب الرئيسي لهذه الالتهابات الصديدية حيث تم عزله بنسبة 82٪، 8٪ والكوديتي ببيوجين مع نسبة 76٪، 4٪ ومزولين من الخراريج وانسجة الكبد على التوالي. وأيضاً قد تم عزل الميكروبات القولونية والعانقودية وبعض الخمار من العينات المستخدمة.

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SUMMARY

The study was conducted to outline the microorganisms mainly inducing or taking part in liver disorders specially hepatic abscesses. The examined samples included 30 livers with multiple abscesses and 26 inflamed livers. F. necrophorum represented the major causative agent (83%) and (30.8%) followed by C. pyogenes (46.7%) and (65.4%) which were isolated from liver abscesses and hepatic tissues respectively. Enterbacteriaceae, Staphylococci and yeast were also detected in both types of samples.

Keywords: Bacteriological assessment, inflamed, cattle liver, hepatic abscesses

INTRODUCTION

A relatively high incidence of hepatic abscesses has been recently reported in various areas of the world. Although liver abscesses occur in all breeds and ages of cattle, the highest incidence and major economic impact is in feedlot animals, (SCANLAN and HATHCOCK, 1983). The damage of the affected livers results in reduced feed efficiency or causing occasional deaths and condemnation of affected livers at slaughter (FOSTER and WOODS 1970).

Ruminitis and liver abscesses in cattle constitute a disease complex when the rumenal lesions are primary foci of infection and liver abscesses the secondary foci of infection (JENSEN et al 1954, NAKAJIMA, et al 1985; LECHTENBERG and NAGARAJA 1991).

Numerous investigators evaluated the microflora of bovine abscesses (SIMON and STOVELL, 1977; HUSSEIN and SHIGIDI, 1974 KANOE et al., 1976). The anaerobic rumen microflora Fusobacterium necrophorum is a major etiologic agent of bovine hepatic abscesses, along with other bacteria as Streptococci; Staphylococci, Corynebacterium pyogenes, Enterobacteriaceae and yeasts (KANOE, et al, 1976; LECHTENBERG et al., 1988).

The present investigation was designed to assess the bacteriology of inflamed liver and hepatic abscesses and to arouse the attention on this economic problem facing cattle at milk-production farms in Assiut.
MATERIAL AND METHODS

A total of 30 frezian cattle livers after emergency slaughtered or death were collected each in a clean bag with its full data. These livers were inflammed and contained multiple abscesses.

Another 26 livers were brought at different occasions after emergency slaughter to the Assiut Veterinary Laboratory for routine bacteriological examination, these samples also showed signs of inflammation and some of them contained hepatic abscesses see Fig.1).

Media employed for aerobic and anaerobic cultures were blood agar along with McConkey’s and Sabouraud’s agar.

Under aseptic precautions, a loopful of pus at the time of excision was streaked directly onto the agar plates. The same technique was done from liver tissue in absence of pus.

Aerobic plates were incubated at 37 °C for 24-48 hrs.

Anaerobic culture technique was done in Gas-pack with the aid of Coz bage generator and incubated also at 37 °C up to 4 days.

Identification of the suspected colonies was performed microscopically for its morphology and Gram reaction, then characterized biochemically using Triple sugar iron (TSI), Methyl red indole urease (MIU) and Litmus milk media (CRUICKSHANK et al, 1975).

Antibiotic sensitivty test was done on some of the isolated organisms against 10 types of antibiotics using the disc diffusion method (CRUICKSHANK et al., 1975).

RESULTS

The results of identification of the cultured bacteria are demonstrated in tables (1), (2).

the antibiogram of the important isolated organisms F. necrophorum and C.pyogenes showed that they were all the same highly sensitive to tobramycin, Naladixic acid, Garamycin, Amikin, Rifamicin and Erythrocin, while less sensitive to Neomycin, Netilmicin and Ampicillin, the organisms were resistant to the action of penicillin.

DISCUSSION

Liver infection is an important disease that affects all kinds of meat animals specially fat beef cattle. This secondary complex syndrome brings about great economic losses to
livestock production even in developed countries, the disease does not only reduce the efficiency of utilization of food material, but can also cause occasional deaths or at least recessiate condemnation of the organs (SIMON and STOVELL, 1971; TAMATE, 1973).

F. necrophorum was isolated from 83% of liver abscesses and from 30.8% of the liver tissues, this shows the predominance of F. necrophorum as the etiologic agent of bovine hepatic abscesses. Our finding are similar to those previously reported by (KANOЕ et al., 1976; BERG and SCANLAN, 1982; SCANLAN et al., 1982; KAKAJIMA et al., 1985; LECHENBERG et al., 1988).

C. pyogenes was detected in a wide range of liver abscesses (46.7%), as well as hepatic tissues (65.4%). This observation is coincident with the results of several authors (JENSEN et al., 1954; KANOЕ et al., 1976; SCANLAN and HATHCOCK 1983; LECHENBERG et al., 1988; KHATZIMANOLAKIS and KOSKOLOS, 1991).

Isolation of C. pyogenes either alone or in combination with other organisms suggested the role of the organism in the etiology of liver disorders and abscesses. The synergistic relationship between it and the anaerobic F. necrophorum is evident sence growth of C. pyogenes would lower the oxidation-reduction potential of the tissue. There is also a possibility that C. pyogenes would produce diffusible factor that would favour F. necrophorum growth, as suggested by some workers (ROBERTS, 1967; RUDER et al., 1981; BERG and SCANLAN, 1982; LECHENBERG et al. 1988).

Isolation of Enterobacteriaceae, Staphylococci and yeasts from similar conditions was recorded by other authors (KANOЕ et al. 1976; SCANLAN and HATHCOCK, 1983; LECHENBERG et al., 1988, KHATZIMANOLAKIS and KOSKOLOS, 1991).

F. necrophorum and C. pyogenes revealed similar antibiogram, this is accorded with the results of BERG and SCANLAN (1982).

According to our results a great attention should be given to the animal feed to avoid rumenal injuries which would facilitate the pathogenesis of abscesses-forming bacteria.

Such precautions in the same time would not favour the production of liver lesions by normal rumenal microflora such as F. necrophorum. Needless to say, these measures would save animal production from the losses due to these diseases.

REFERENCES


Fig. (1): Shows Inflammed Cattle liver with abscesses formation.
**Table (1): The type of the microorganisms isolated from hepatic abscesses.**

<table>
<thead>
<tr>
<th>Microorganism</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. necrophorum</td>
<td>6</td>
<td>20%</td>
</tr>
<tr>
<td>F. necrophorum + C. pyogenes</td>
<td>10</td>
<td>33.33%</td>
</tr>
<tr>
<td>&quot; + &quot; + coliform + Staphylococci</td>
<td>4</td>
<td>13.33%</td>
</tr>
<tr>
<td>&quot; + coliform + Staphylococci</td>
<td>5</td>
<td>16.66%</td>
</tr>
<tr>
<td>coliform + Staphylococci</td>
<td>4</td>
<td>13.33%</td>
</tr>
<tr>
<td>&quot; + &quot; + yeasts</td>
<td>1</td>
<td>3.33%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
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**Table (2): The type of the microorganisms isolated from 26 inflamed livers**

<table>
<thead>
<tr>
<th>Microorganism</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. necrophorum + C. pyogenes + coliforms</td>
<td>5</td>
<td>19.23%</td>
</tr>
<tr>
<td>&quot; + &quot; + &quot; + Staphylococci</td>
<td>3</td>
<td>11.54%</td>
</tr>
<tr>
<td>C. pyogenes + coliforms + Staphylococci</td>
<td>9</td>
<td>34.62%</td>
</tr>
<tr>
<td>coliforms + Staphylococci</td>
<td>4</td>
<td>15.38%</td>
</tr>
<tr>
<td>coliforms</td>
<td>5</td>
<td>19.23%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26</strong></td>
<td><strong>100%</strong></td>
</tr>
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