بعض الدراسات عن السل الكاذب في الخراف في صعيد مصر

اسعافل صدقي، عبد الخالق الخضراري، سيد النسيم

تظهر مرض السل الكاذب مرضاً خطيراً بالنسبة للأفراد والأسر. وقد وجد أنه يسبب خسائر فادحة لهذه الصناعات في مصر.

لذا، تم دراسة وتحليل هذا المرض في صعيد مصر وأشعلت الدراسة على الأطراف، بموجب الأغام بمجرد مصر وقرى و شكراً جزيلاً لمشترى أعراض المرض والظروف المشابهة.

كما تم تداول الأغام لمجرد مصر وقرى و شكراً جزيلاً لمشترى أعراض المرض والظروف المشابهة.

وقد وجد أيضاً أن التحالل أثرت من جهة أخرى بحال سلسلة نفس المرض، فلم يتم جزء منه من قبل. هذا ما الذي يمكنه من الشكل في دور الجراثيم المحتشة عن الجر المستغجلة في أحداث الأزمة كما كان.

معتقداً أن هناك الطريقة الرئيسية لأحداث الأزمة.

وهكذا، فإنها يرجح أن أثر هذه الأحداث للأزمة في صعيد مصر تتجاوز الميكروب الضيق للمرض عن طريق الماء.

وقد أخذت ممام ومراقبة على بعض المناطق من أجل سلسلة الأزمة، وعينات بحرية في هذه المنطقة.

يجب علينا أن نحتاج إلى الميكروب الضيق للمرض، ونعمل على تحقيق أهدافنا، مثلاً، الحفاظ على الميكروب الضيق للمرض، ونعلم بأن هناك تبادل مع هذه الحالة.

ووفقًا لما يمكن أن نتطلع إلى الحلول النهائية، فإن الرهائن كانت هناك طبيعة. فكل هذه الحالات الصحية غرب أنه لم يتعدى الأزمة الطافية التي تشاهد في الغدد الأخرى في الأزمة الطبية لهذا المرض. 

أحسنت البكريولوجيا، طيب الحدوان - كلية الطب، الطبي البيطري - جامعة أسوان.
SOME STUDIES ON CASEOUS LYMPHADENITIS OF SHEEP IN UPPER EGYPT
(WITH 4 TABLES)

By
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SUMMARY
Caseous lymphadenitis is a serious disease of sheep and goats. Sheep from ten villages and one governmental farm in Assiut governorate were examined for clinical manifestation of the disease and the isolation of the causative organism. Sheep from abattoirs were also examined before and after slaughter for the same purpose. It was found that the parotid lymph node was the one that showed the highest percentage of infection. Moreover lambs below six months of age were found to be infected, although they were never been shown before. Ingestion was found to be the most predominant route of infection in Upper Egypt. Samples from surface soil of some sheep dwellings, fencings, surface skin and nasal swabs, from both apparently normal and clinically infected sheep failed to yield the causative organism on culture. By experimental infection it was found that both intradermal and S/C inoculation only yielded the organism from the inoculation site and failed to isolate the organism by scarification method. Oral dosing was negative to any lesions in case of small dose. However, a bigger dose resulted in enlargement of mesentery lymph nodes and from which the organism was isolated. Intravenous inoculation produced lesions in parenchymatous organs, from which the organism was isolated.

INTRODUCTION
Caseous lymphadenitis is an insidious chronic disease of sheep and goats, which is of considerable concern to animal breeding on a world wide basis.

The etiologic factor has for a long time been accepted to be Corynebacterium pseudotuberculosis (C. ovis) since it was isolated for the first time from diseased sheep.

In Egypt, caseous lymphadenitis was found to affect about 10% of the sheep population and would cause severe losses to sheep industry which was estimated to stand for ten million Egyptian pounds annually.

The causative organism, C. ovis was found to cause different disease syndromes in sheep, other than caseous lymphadenitis. In equines and bovines it causes ulcerative lymphangitis. In bovine, particularly the water buffalo, a severe disease syndrome was attributed to such infection to which the name “oedematous skin disease” was given locally.

The earliest isolation of C. ovis from sheep was done as early as 1901 by Preiss and Guinard. They isolated the organism; C. ovis for the first time from sheep and related it to caseous lymphadenitis. NOCARD and MOHLOR (1899) as well as CAREE and BIODITEAU (1908) isolated the Preiss-Noord bacillus from affected sheep. They stated that it was Gram-positive diphtheroid capable of tissue invasion and production of powerful exotoxin.

Several authors thereafter (DAY, 1928; WOODOFF and GREFORY, 1929; JEWET, 1930; HUNTER, 1933) isolated C. ovis from diseased sheep and gave an account of caseous lymphadenitis.

Concerning the lymph node distribution of caseous lymphadenitis, HARCH (1958) stated that the most commonly affected lymph nodes are prescapulars and precervicals. Thereafter, mediastinals, bronchials and sublimbers. Finally all nodes of body may be affected. SMITH and JONES (1961) gave the impression that lesions were formed in lung, and in lymph nodes, especially prescapular, prepectoral and mediastinal lymph nodes. JUBB and KENNEDY (1971) also stated that the superficial nodes are only affected namely the prescapulars and precervicals being mostly infected.

In lower Egypt, NADIM et al. (1966) pointed out that in slaughtered sheep bronchials (31%), mediastinals (21.5%), submaxillaries (17.5%) and prescapulars (17.5%) were mainly found infected on meat inspection.

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1. SEDDIE, et al.

In the experimental studies HAMID and ELMI (1973) artificially infected goat by \textit{C. ovis} culture by both scarification and subcutaneous routes to study their immune response. The animals showed no clinical symptoms during the time of the experiment. Others tried the i.v. route; CARNE (1973) used a dose of $5 \times 10^6$ with the result of abscess formation in lungs and kidneys and death of some sheep within three days. Other concentrations were used by ADDO (1979) which amounted $4 \times 10^6$ with the aim of studying the pathology and bacteriology of abortion in experimentally infected ewes using i/v route.

In this work the distribution of infection in the lymph nodes in clinically infected animals and slaughtered sheep was studied. Some experimental studies were also tried, in order to clarify some aspects of the epidemiology of the disease in Upper Egypt.

**MATERIAL and METHODS**

1. **Field cases**: A total of 3822 sheep (768 under 6 months, 626 from 6 months to 1 year, 698 from 1 to 2 years, and 1730 over 2 years of age) from 10 villages and one governmental farm in Assiut Governorate were examined clinically. This examination included the palpation of the external superficial lymph nodes, prescapular, precrural, submaxillary, parotid, supramaxillary in females and superficial inguinal in males.

   The following samples were collected from both clinically healthy and apparently infected sheep for laboratory examination and diagnosis:

   a. Swabs from nostrils.

   b. Swabs from hairless areas of surface skin (inner thigh).

   c. Faecal pellets were secured in plastic bags.

   d. Surface soil of some pens (sheep dwellings) were collected in plastic bags.

   e. Swabs from lesions (abscessed lymph nodes or any other suppurative lesions).

2. **Slaughtered sheep**: A total of 33 sheep (24 males & 9 females) were examined at Assiut abattoir by antemortem and postmortem and postmortem examination. The following samples were collected for bacteriological examination:

   a. Superficial lymph nodes; prescapular, precrural, submaxillary, parotid, superficial inguinal in males and supramaxillary in females.

   b. Internal deeply seated lymph nodes that showed pathological lesions.

   c. Swabs from any lesion in any organ.

3. **Sheep for experimental infection**: Fourteen Ovis sheep 1 - 3 years of age from Assiut Province were selected and their history and source indicated no previous infection. These were divided into seven pairs and were used for experimental infection.

4. **Laboratory animals for pathogenicity test**: Guinea-pigs, each weighing 200 - 300 gram were used.

5. **C. ovis culture for experimental infection**: A virulent strain of \textit{C. ovis} was obtained from the central laboratory of Animal Health Research Institute which was standardized in broth culture to contain 1019 per one millilitre.

6. **Culture and test media used**:

   a. Broth medium.

   b. Blood agar.

   c. Peptone water.

   d. Christensen's medium.

   All these media were prepared and used according to CRUECKSHANK et al. (1975).

**Procedures adopted for sampling and culturing**:

I - **Clinically normal sheep**: The samples were taken as mentioned before.

II - **Clinically infected sheep**:

   The wool in the vicinity of the lesion was closely clipped, the area cleaned and disinfected by 5% tincture iodine. The swabs, were taken from inside the lesion after being incised under complete aseptic conditions.

   These swabs were inoculated into MacCartney's bottles containing serum broth. These bottles were incubated

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at 37°C for 48 hrs. and were subculutred on blood agar plates. Plates were then incubated for 24 to 48 hrs. and were checked for bacterial growth, and the bacterial growth were identified as follows:

1- Direct smears were made, Fixed, stained by Gram’s method and were examined for morphology and staining reaction.
2- Cultural characters in serum broth and on blood agar were noted and studied.
3- The following biological tests were done:
   a- Sugar fermentation of dextrose, sucrose, maltose, lactose and salicin.
   b- Reaction on litmus milk.
   c- Gelatin liquefaction.
   d- Catalase test.
   e- Urease test.
   f- Pathogenicity test for guinea pigs by S/C inoculation in the thigh region.

III- Slaughtered sheep:
The lymph nodes or lesions were scared by a heated spatula and then opened under complete aseptic conditions and inoculated into MacCarty’s bottles containing serum broth. Similar further procedures for culture, isolation and identification were carried out.

IV - Experimental Infection of sheep:
The dose, route and site of inoculation of the seven pairs Oslimi sheep are given in Table I. The last Pair (No. 7) was left as a control and was inoculated by different routes with peptone water only.

RESULTS

The clinical examination of 3822 sheep of different ages and sexes revealed the enlargement of lymph nodes of 167 heads (4.3%) as shown in Table II. The percentage of clinically infected sheep, site of lesion and C. ovis isolation as well as other isolates were recorded also in Table II.

Table III revealed C. ovis isolation from lymph nodes of 33 clinically normal slaughtered sheep and site of isolation. The clinical manifestations and lesions of sheep experimentally infected with C. ovis were recorded in Table IV.

DISCUSSION

In this study C. ovis was isolated from 20% as suckling lambs around six months of age which have never been shown before. This result agreed with the finding of MADDOY (1953), who stated the possibility of isolation of C. ovis from four months old lambs.

The results of pathological findings before and after slaughtering sheep in this study showed that apparently normal sheep may harbour the organism. Culture of lymph nodes of slaughtered sheep (24 males and 9 females) resulted in the isolation of C. ovis from one lung and one parotid lymph node of male individuals, while those of female did not reveal the presence of the organism. Consequently it can be stated safely that the actual incidence of C. ovis infection should not be based only on the clinical examination of sheep since hidden latent infection may be overlooked on such examination. This constitutes a risk of the dissemination of the disease among healthy sheep.

Up till now there are no reliable methods to reach an accurate diagnosis of latent infection, AWAD (1960), FARID and MAHMOUD (1960), ZAKI (1968), SHIGIDI (1979) and BAKKAT et al. (1980).

Isolation of Staph. aureus, Strept. pyogenes and C. pyogenes from lymph nodes of clinically infected sheep were recorded in our research also REMSHAW et al. (1979) described cases from which they isolated other pyogenic organisms (C. pyogenes, C. equi, Staph. aureus and Pseudomonas aeruginosa) in association with C. ovis.

Laboratory examination of various lymph nodes of sheep pointed out that the parotid lymph nodes showed the highest percentage of C. ovis infection. MADIM et al. (1966) found that the bronchial and mediastinal lymph nodes showed the highest percentage of C. ovis infection.

Experimental infection in this study was carried out by different methods, one of which by scarification of the skin in an area adjacent to the right submaxillary lymph node. After the lapse of 200 days the organism was not recovered from the site of injection or the adjacent lymph node, which showed no abnormalities. Absence of infection by this route may throw some doubt on the role of shearing as a primary cause or way through which the causative organism may be introduced into the body.

Experimental intradural infection resulted in the isolation of C. ovis only from the site of inoculation where it formed only a local supplicative focus.

In transanal infection in this study resulted in the isolation of C. ovis from the lungs in one case, while in the other lung involvement without C. ovis isolation was manifested. Oral infection entailed a relatively small dose of C. ovis culture (10 mls of 10^15/ml) which may explain the reason of failure to recover the organism from faeces, gut, and mesentric lymph nodes. This may be attributed to the lowered virulence of the organism so they produce no lesions or that the number of organisms in the inoculum was below that needed to initiate infection. CARRÉ (1932) stated that sheep experimentally infected by the oral route suffered from lesions which were confined to the lymph nodes draining the buccal cavity and that the organism was not recorded from caudal gut.

In the 2nd experimental oral route, where a bigger dose of C. ovis culture (50 mls) was given, the possibility of intestinal infection was greater than small dose. The causative organism was recovered from the enlarged mesentric lymph nodes 200 days post infection similar to that reported by BERSCHNER (1959). Intravenous experimental infection of sheep with small C. ovis dose (1 ml) resulted in abscess formation in the internal parenchymatous organs such as spleen, liver and lung as well as bronchial lymph nodes. C. ovis was recovered on culturing the lesions produced. It appears therefore that caseous lymphadenitis might have a bacteremic phase in which the organisms are disseminated to parenchymatous organs, were they colonize and set up infection.

REFERENCES


CASEOUS Lymphadenitis of Sheep


Table (1): Experimental infection of sheep by C. ovis culture

<table>
<thead>
<tr>
<th>Group No</th>
<th>Route of inoculation</th>
<th>Dose given</th>
<th>Site of inoculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Subcutaneous</td>
<td>3 ml.</td>
<td>Area adjacent to right axilla.</td>
</tr>
<tr>
<td>2</td>
<td>Intradermal</td>
<td>3 ml.</td>
<td>0.2 ml. doses in different sites adjacent to right submaxillary l.n.</td>
</tr>
<tr>
<td>3</td>
<td>Scarification</td>
<td>5 ml.</td>
<td>In clipped area adjacent to right shoulder.</td>
</tr>
<tr>
<td>4</td>
<td>Intranasal</td>
<td>3 ml.</td>
<td>1.5 ml. in each nostril by a dropper.</td>
</tr>
<tr>
<td>5</td>
<td>Oral</td>
<td>10 ml.</td>
<td>Oral dosing.</td>
</tr>
<tr>
<td>5a</td>
<td>Intravenous</td>
<td>1 ml.</td>
<td>Into the right jugular vein.</td>
</tr>
<tr>
<td>5b</td>
<td>Big oral</td>
<td>50 ml.</td>
<td>Oral dosing.</td>
</tr>
<tr>
<td>6</td>
<td>Different</td>
<td>---</td>
<td>Only pepton water by different routes.</td>
</tr>
</tbody>
</table>

* A week later these groups received a second identical dose by the same route.
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Table (III)
Isolation of *C. ovis* from Lymph Nodes Clinically Normal Slaughtered Sheep

<table>
<thead>
<tr>
<th>Carcasses Examined</th>
<th>Lymph Nodes</th>
<th>Abscess</th>
<th>Dungs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>L</td>
<td>R</td>
</tr>
<tr>
<td>Males (Number 24)</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td><em>C. ovis</em> isol.</td>
<td>-----</td>
<td>-----</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Females (Number 9)</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td><em>C. ovis</em> isol.</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Total (Number 33)</td>
<td>33</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td><em>C. ovis</em> isol.</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
</tbody>
</table>

*Pres. = Prescapular, Precr. = Precrural, Sub. mx. = Submaxillary, Super. Ingu. = Superficial inguinal, Staphylococci were isolated*