

## MICRO-ORGANISMS ASSOCIATED WITH CLOSED ABSCESSSES OF CAMELS IN EGYPT

BY

M. ISMAIL; M.EZZAT\*\*, JAKEEN EL-JAKEE;  
ZEINAB EL-SAYED\*, AND MERVAT ABD EL-RAHMAN\*

Department of Microbiology, Faculty of Veterinary  
Medicine, Cairo University and

\* Animal Health Institute, Dokki, Egypt.

\*\* Department of Microbiology, Faculty of Veterinary  
Medicine, Suez Canal University.

(received: 9.1.1990).

### INTRODUCTION

Closed abscesses are perhaps the most important affections of one humped camels in Egypt. The most common site of these abscesses are on the thoracic regions, shoulders, abdomen and the hind quarters also being affected fairly frequently (Rathore and Lodha, 1973). The severity of the abscesses depends on the position in which it occur and the contamination with differ forms of micro-organisms (Shaton'Ko, 1955; Lam et al., 1963). Failure to treat such pyogenic abscesses properly and promptly may lead to many complications. Such abscesses may becomes chronic, leading to poor condition of the affected camels (Roberts, 1968; Jubb and Kennedy, 1970).

Some investigators recorded that certain different facultative anaerobic bacterial species were commonly recoverd from camels affected with abscesses (Hagen and Fossum, 1962; Rathors and Lodha, 1973; Morcos and Amin, 1974; Finely, 1975, Tannock and Dobbinson, 1984 and Ismail et al., 1985) but shows various considerable differences in the number and the incidence of facultative anaerobic isolates.

### *Micro-Organisms Associated With Closed Abscesses.....*

Micro-organisms recovered were species of the genera Staphylococcus, Corynebacterium, Streptococcus, Micrococcus, Escherichia, Klebsiella, Proteus and Pseudomonas. Among the strict anaerobic bacteria isolated from closed abscesses, *Cl. perfringenes* were the most common (Zieller, 1966 and Rathore and Lodha, 1973).

This work was carried out to investigate the aerobic and anaerobic organisms isolated from closed abscesses in one humped camels. It was largely a reflection of incubating all the examined abscesses anaerobically.

### MATERIALS AND METHODS

A total of 206 samples were obtained from closed abscesses affected camels during the period from January 1986 to July, 1988. The localization of the abscesses and the nature of the pus were recorded so as to determine if there is any correlation between the isolates and these factors.

Swabs from abscesses have been transferred directly into sterile peptone water (0.1%) in a sterile homogenizer flask and the content was homogenized at 3000 r.p.m. for 2.5 minutes with automatic homogenizer and then cultivated onto further media. One portion was seeded onto nutrient agar, blood agar, MacConkey Lactose bile salt agar, Edward's media and Sabouraud's dextrose agar media and all incubated aerobically for 2 days except the last medium was incubated at room temperature for 5-7 days. Inoculum was placed in tetrathionate broth and incubated at 37°C for 12-18 hours, then a loopfull from this media was then subcultured onto S.S. agar (oxid) media. Another portion was inoculated into cooked meat media and incubated anaerobically for 24 hrs, then a loopful was seeded onto reinforced clostridial blood agar plates containing 70 ug/ml neomycin sulphate and incubated anaerobically at 37°C for 48 hrs and examined. All isolates

M. Ismail et al.

were identified according to Cruickshank et al., (1975) and Finegold and Martin (1982). Serological grouping of the isolates belonging to the genus *Streptococcus* was carried out by the precipitin test based on the method of Bailey and Scott (1978). Identification of *Cl. perfringens* was carried out by toxin anti-toxin plate method and typing of the toxigenic strains were obtained according to Smith and Holdeman (1968).

## RESULTS AND DISCUSSION

A total of 206 closed abscesses of camels were examined for their causal agents. A total of 20 different types of facultative anaerobic and three various forms of strict anaerobic organisms were detected. The type of micro-organisms, number, body location of closed abscesses in camels are presented in Tables(1 and 2). These tables shows that the subcutaneous closed abscesses in camels were mostly in the thoracic region (51), fore limbs (41), shoulder region (30), abdomen (25) and head (23).

Staphylococcus was the genus most frequently encountered (43 isolates, 20.87%) and were differentiated biochemically into: *Staph. aureus* (12.14%), *Staph. epidermidis* (3.87%), *Staph. saprophyticus* (2.43%) and *Staph. caseolyticus* (2.43%). The results of the other isoaltion of facultative anaerobic bacteria from closed abscesses revealed the predominance of *Str. pyogenes* (9.22%). *C. pyogenes* (5.34%), *E.coli* (5.34%) and *Ps. aeruginosa* (5.34%), conform to the same general pattern as that obtained by others (Velu and Zottner, 1934; Ochi and Zaizen 1937; Hagen and Fossum, 1962; Rathore and Lodha, 1973; Finley, 1975). Moreover, Deitz et al., (1970) examined bacteriologically the secretions and pus from 188 pyogenic closed abscesses and revealed *C. pyogenes* in 66% of cases, staphylococci (9.4%), streptococci (8.0%) and *Ps. aeruginosa* in 2.4%. The prevalence

Table (I) : Relative incidence of species of facultative anaerobes isolated from each type of closed abscesses in camels.

Genus and Species	Isolates		No. of isolates obtained from						
	No.	%	Thoracic Region (51)	Fore limbs (41)	Shou-lder (30)	Abdo-men (25)	Head (23)	Knee (18)	Hind quarters (18)
<u>Genus Staphylococcus</u>	43	20.87	15	11	4	5	4	2	2
Staph. aureus	25	12.14	12	7	-	2	1	2	1
Staph. epidermidis	8	3.87	-	3	2	-	2	-	1
Staph. saprophyticus	5	2.43	3	1	-	1	-	-	-
Staph. caseolyticus	5	2.43	-	-	2	2	1	-	-
<u>Genus Corynebacterium</u>	31	15.05	5	8	6	6	2	3	1
C. pyogenes	11	5.34	2	2	3	2	2	-	-
C. pseudotuberculosis	8	3.87	1	5	1	1	-	-	-
C. Striatum	7	3.41	-	1	-	3	-	2	1
Unidentified	5	2.43	2	-	2	-	-	1	-
<u>Genus Streptococcus</u>	30	14.56	6	8	2	5	5	1	3
Str. pyogenes	19	9.22	3	5	-	4	3	1	3
Str. agalactiae	6	2.91	2	-	2	-	2	-	-
Unidentified Str.	5	2.43	1	3	-	1	-	-	-
<u>Genus Micrococcus</u>	5	2.43	2	1	-	-	-	-	2
M. luteus	4	1.94	2	-	-	-	-	-	-
M. varians	1	0.49	-	1	-	-	-	-	-
<u>Genus Escherichieae</u>	11	5.34	6	-	1	-	2	-	2
E. coli	11	5.34	6	-	1	-	2	-	2
<u>Genus Klebsielleae</u>	9	4.37	3	3	2	-	1	-	-
E. liquefaciens	5	2.43	3	2	-	-	-	-	-
Serratia	4	1.94	-	1	2	-	1	-	-
<u>Genus protecae</u>	23	11.17	3	-	7	3	2	8	-
Pr. vulgaris	12	5.83	3	-	2	2	-	5	-
Pr. mirabilis	11	5.34	-	-	5	1	2	3	-
<u>Genus pseudomonas</u>	11	5.34	2	1	4	3	1	-	-
Ps. aeruginosa	11	5.34	2	1	4	3	1	-	1
Yeasts	3	1.46	1	-	-	-	1	-	-
<b>Total</b>	<b>166</b>	<b>80.58</b>	<b>43</b>	<b>32</b>	<b>26</b>	<b>22</b>	<b>18</b>	<b>14</b>	<b>11</b>

*Micro-Organisms Associated With Closed Abscesses.....*

of the aforementioned bacterial isolates fall within the wide range of microorganisms recorded in this work.

Concerning the scanty occurrence of other facultative anaerobic organisms isolated from closed abscesses of camels, it was found that the incidence of *Str. agalactiae*, *M. luteus*, *M. varians*, *E. liquefaciens* and yeasts extending in between 1.46% and 2.91%, this goes hand in hand with the findings of Morcos and Amin (1974) and Tannock and Dobbins (1984). All isolates belonging to the genus *Streptococcus* were identified according to their biochemical characteristics as well as on their serological Lancefield typification. Examination of 30 strains of streptococcus species obtained from closed abscesses revealed the following groups: Group "A" (*Str. pyogenes*) and group "B" (*Str. agalactiae*) in an incidence of 9.22% and 2.91% respectively. In addition, five of these strains could not be related to any of the recognized groups. Nearly similar results have been described by Zieller (1966) who concluded that the most predominant Lancefield groups recovered from closed abscesses were group "A" and "B" streptococci.

Among the strict anaerobic bacteria isolated from closed abscesses, *Cl. perfringens* were the most common (16.99%) as shown in Table (2). In addition to a few strict anaerobic isolates were detected including *F. necrophorum* (1.49%) and *Peptostreptococcus anaerobius* (0.49%). The subcutaneous closed abscesses in camels due to *F. necrophorum* were mostly in the shoulder and thoracic regions. This nearly coincides with the results of Rathose and Lodha (1973).

Colour and other characteristics of the pus exudates produced when opened these abscesses did not present specific patterns related to any family or species of the aforementioned facultative anaerobic or strict aerobic organisms. Thickness, creaminess or thinness of the pus could be associated to all various

Table (2) : The identity of 40 bacterial isolates of strict anaerobes and mixed infection obtained from closed abscesses.

Isolates	Site of isolation from :								
	No.	%	Thoracic region (51)	Fore-limbs (41)	Shoulder region (30)	Abdomen (25)	Head (23)	Knee joints (18)	Hind quarters (18)
<b>I. Anaerobic organisms :</b>									
Cl. perfringens	35	16.99	7	9	2	1	5	4	7
F. necrophorum	3	1.46	1	0	2	0	0	0	0
Peptostrept. anaerobius	1	0.49	0	0	0	1	0	0	0
<b>II. Mixed Infection :</b>									
Cl. perfringens + Staph. aureus	1	0.49	0	0	0	1	0	0	0
Total	40	19.42	8	9	4	3	5	4	7

Table (3) : Typing of Cl. perfringens recovered from closed abscesses of infected camels.

No. of isolates tested	Types of the toxigenic strains									
	No.	%	D	%	A	Total				
36	7	19.44	15	41.67	10	27.78	4	11.11	29	80.56

micro-organisms. Colour characteristics of the exudates such as white, creamy, yellow are greenish could sometimes be found in unopen abscesses associated with corynebacterium species, *Staph. aureus* and *Ps. aeruginosa*. These agree with the findings stated by Roberts (1968)

Table (3) shows that members of non-toxigenic *Cl. perfringens* constituted 19.44% of the total isolates, while toxigenic strains were frequently met with in an incidence of (80.56%). In trials to study the prevalent types of toxigenic *Cl. perfringens* recovered from unopen abscesses of camels, it was found that type "D" appeared fairly common (41.67%) of the total clostridial isolates, next, type "A" formulating 27.78%. On the contrary type "B" representing the lower incidence (11.11%). In comparing these results with those of other workers, one may quote the work of L'Ecuyer (1967) who isolated six pathogenic and six non-pathogenic strains of *Cl. perfringens* from exudative closed abscesses.

Further study on the strict anaerobic organisms isolated is necessary in order to establish their possible role in the pathogenesis of closed abscesses in camels.

### SUMMARY

A total of 206 closed abscesses among camels were examined for their causal agents. Micro-organisms of facultative anaerobic bacteria recovered were species of the genera *Staphylococcus*, *Corynebacterium*, *Micrococcus*, *Streptococcus*, *Escherichia*, *Proteus*, *Klebsiella* and *Pseudomonas* in order of their frequency. Among the strict anaerobic organisms, *Cl. perfringens*, *F. necrophorum* and *Peptostrept. anaerobicus* were isolated in an incidence of 16.99%, 1.46% and 0.49% respectively.

## *Micro-Organisms Associated With Closed Abscesses.....*

The body location of these closed abscesses in relation to different types of micro-organisms were discussed in details.

Examination of thirty isolates of streptococci serologically were done.

On typing of 36 *Cl. perfringens* isoaltes obtained from closed abscesses, 29 were toxigenic and types D, A and B were identified in order of their frequency.

### REFERENCES

1. Bailey, W.R. and Scott, E.G. (1978): Diagnostic Microbiology. 5<sup>th</sup> Edt. The C.V. Mosby Company, Saint Louis.
2. Cruickshank, R.; Duguid, J.P.; Marmaion, B.P. and Swain, R.H.A. (1975): Medical Microbiology, 12<sup>th</sup> Edt. Vol. II, Churchill Livingstone, Edinburgh, London and New York.
3. Deitz, O.; Gangel, H. and Horsch, F. (1970): Bacteriological and therapeutic aspects of pyogenic infection. Mh. Vet. Med., 25, 784-787.
4. Finegold, S.M. and Martin, W.J. (1982): Diagnostic Microbiology, 6<sup>th</sup> Edt., The C.V. Mosby Company, St. Louis.
5. Finley, G.G. (1975): A survery of vertebral abscesses in domestic animals. Cand. Vet. J., 16 (4), 114-117.
6. Hagen, O. and Fossum, K. (1962): A non-haemolytic coryneform diphtheroid bacterium isolated from pyogenic processes in domestic animals. Nord. Vet. Med., 14, 407-414.

M. Ismail et al.

7. M. Ismail, M. Enany, F. El-Seedy and M.T. Shouman (1985): Oedematous skin disease of camels in El-Sharkia Governorate. *Fist. Int. Conf. App. Sci.* Vol. II, 623-631.
8. Jubb, K. and Kennedy, P. (1970): Pathology of domestic animals. Vol. II, 2nd Edt., Academic press, New York.
9. Lam, G.T.; Sweeny, F.J.; Winter, C.N. and Wise, R.I. (1963): Abscess forming factors produced by *Staph. aureus*. *J. Bacteriol.*, 86, 611-615.
10. L'Ecuyer, C. (1967): Exudative epidermitis in guinea pigs. Bacteriological studies on the causative agents. *Cand. J. Comp. Med.*, 31, 243-247.
11. Morcos, M.B. and Amin, S.M. (1974): Some practical view in wound treatment. *J. Egypt. Vet. Med. Assoc.*, 34 (31), 666-672.
12. Ochi, Y. and Zaizen, K. (1937): Studies on *Corynebacterium pyogenes* in abscesses. *J. Jpn. Soc. Vet. Sci.*, 16, 17-31.
13. Rathore, M.S. and Lodha, K.R. (1973): Observation on skin diseases in camels. *Indian Vet. J.*, 50 (11), 1083-1088.
14. Roberts, R.D. (1968): Biochemical reactions of *Corynebacterium pyogenes*. *J. Pathol. Bacteriol.*, 95, 127-130.
15. Shaton'Ko V.A. (1955): A disease of camels characterized by purulent lymphadenitis. *Trud, 7 sess, Ahad, Nauh Turhen, S.S.R., Ashhkabad*, 54, 388-390.
16. Smith, L.D. and Holdeman, L.V. (1968): The pathogenic anaerobic bacteria. 1st Edt., Charles C. Thomas, Publisher Spring Field, Illinois, U.S.A.

*Micro-Organisms Associated With Closed Abscesses.....*

17. Tannock, G. and Dobbinson, S. (1984): A bacteriological investigation of subcutaneous abscesses. *N.Z. Vet. J.*, 33 (3), 27-29.
18. Velu, H. and Zottner, G. (1934): Differential characteristics of certain pyogenic bacteria. *tijdschr. Diergeneesk.*, 70, 594-596.
19. Zieller, P. (1966): The problem of infected surgical wounds in the animal surgery. *Munch. Tierarztl. Wschr.*, 79, 164-167.