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SALMONELLA IN SLAUGHTERED CAMELS IN EGYPT

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INTRODUCTION

Sandiford [1944] was the first to attract the attention to the risk of transmission of salmonellosis by camels to persons eating camel's meat in Egypt He attributed 7 food poisoning outbreaks to S.typhimurium. Four of them resulted after consumption of camel's meat. Asurvey was carried out by Floyd [1955] among domestic animals. Three camels were found to be infected with S. saint-paul, S. cholera-suis and S. paratyphi . Studies on camel salmonellosis have been carried out also by Farrag and EL-Afifi [1956], Zaki [1956], Hamada et al [1963] and Kamel and Lotfi [1963]

The camel is one of the domestic animals used

for work and meat production in Egypt. Thus infected camels constitute a health hazard to man through direct or indirect contact or as a result of consumption of meat or meat products from infected camels. on the other hand, salmonella carriers disseminate the organisms in their surroundings and infection may spread to other animals. The examination of camels for salmonella is therefore of great importance.

MATERIAL AND METHODS

The mesenteric lymph nodes and pieces of the small intestine of 400 apparently healty slaughtered camels wer examined for salmonella. The samples were enriched into selenite and tetrathionate broth for 18 hours at 37C and subcultured onto MacConkey and S.S. agar media for 24-48 hours at 37C. Suspected colonies were examined biochemically and serologically according to Edwards and Ewing [1972].

R E S U L T S

Atotal of 64 salmonella isolates were recovered from 60 out of the 400 camels examined [15%]. The mesenteric lymph nodes enriched into selenite F broth, yielded 15 isolates on MacConkey and 32 on S.S. agar, while the tetrathionate broth gave 19 isolates on MacConkey and 36 on S.S. agar. The pieces of small intestines enriched into selenite broth yielded 12 and 18 isolates when subcultured onto MacConkey and S.S. agar Media

respectively. The tetrathionate broth gave 7 and 14 isolates onto the above mentioned media [Table 1].

It is worthy to mention that salmonellae were recovered from the lymph nodes in 49 out of the 60 infected camels [81. 7 %]. and from the intestine in 26 camels [43. 3 %].

Table [1]

Isolation of Salmonella from slaughtered camels using different enrichment and selective media

Samples	Media enrichment	Selective		NO.Of isolates	%
Mesenteric lymph nodes	Selenite F broth	MacConkey	agar	15	3.75
		S.S.	agar	32	8.00
	Tetrathionate broth	MacConkey	agar	19	7.79
		S.S.	agar	36	9.00
Small Intestine	Selelnite F broth	MacConkey	agar	12	3.00
		S.S.	agar	18	4.50
	Tetrathionate broth	MacConkey	agar	7	1.75
		S.S.	agar	14	3.50

The serological typing of the 64 isolates revealed the presence of 11 serotypes, namely S. heidelberg S. newlands, S. chester, S. eastbourne, S. goettingen S. typhi-murium, S. brazzavile, S. lokstedt, S. israel, S. newport and S. newbrunswick. The mesenteric lymph nodes yielded 11 serotypes whereas only 8 serotypes were recovered from the intestine. S. israel, S. newport and S. newbrunswick could be isolated only from the lymph nodes [Table 2].

S. heidelberg was the most common serotype isolated from the mesenteric lymph nodes of infected camels [23.3 %]. followed by S. chester [18.3%] and S. newlands [15 %]. In the small intestine. S. newlands was the most common [13.3%], followed by S.heidelberg [11.6 %] and S. chester [8.3 %].

Mixed infection could be recorded in 4 camels. S. heidelberg and S. brazzavile were isolated from a lymph node of one camel; S. newlands and S. eastbourne from a lymph node ofanother camel; S. chester and S. newlands were isolated from the lymph nodes while S. goettingen and S. typhimurium were isolated from the intestines of the 3rd and 4th cases respectively.

Table [2]

Salmonella serotypes isolated from mesenteric lymph nodes and small intestines of the positive 60 camels

Salmonella Serotypes	Frequency of isolation	mesenteric lymph nodes		Small intestine	
		NO.	%	NO.	%
S. heidelberg	16	14	23.3	7	11.6
S. newlands	15	9	15.0	8	13.3
S. chester	15	11	18.3	5	8.3
S. eastbourne	6	4	6.6	2	3.3
S. goettingen	3	2	3.3	1	1.6
S. typhi-miurium	3	2	3.3	1	1.6
S. brazzavile	3	3	5.0	1	1.6
S. lokstedt	2	1	1.6	1	1.6
S. israel	1	1	1.6	-	-
S. newport	1	1	1.6	-	-
S. newbrunswick	1	1	1.6	-	-
Total	64	49	81.7	26	43.3

DISCUSSION

The incidence of Salmonella in camels was reported to be 2 % [Floyd 1955]. 8 % [Hamada et al, 1963 and 1.5 % [Kamel and Lotfi, 1963]. In the present work, 15 % of camels examined were found to be carriers of salmonella. This significant difference seems in our opinion to be due to the methods of isolation rather than to an increase in the incidence. It is clear from the results that the MacConkey agar medium which is commonly used in our country, was not so efficient and the sole use of it would have revealed an incidence of 3.75 % for the samples of lymph nodes and 3 % for samples of the small intestine if selenite F broth was used. The corresponding figures for the enrichment with tetrathionate broth would be 6.75 % and 1.75 %. The sole use of S.agar would give an incidence of 8 % [lymph nodes] and 4.5 % [intestine] when selenite F broth was used and 9 % and 3.5 % respectively when terathionate broth was used.

On the other hand, the examination of lymph nodes and small intestine using 2 different enrichment and 2 different selective media resulted in this high rate of recovery [15 %].

Only two salmonela serotypes, namely S. typhimurium and S. eastbourne have been recorded before in camels in Egypt [Zaki, 1956; Kamel and Lotfi, 1963]. The other 9 serotypes seem to be the first record in camels in our country, of which S. heidelberg, S. S. newlands, S. chester and S. newport were recorded before in Egypt but in other animals [EL-Agroudi, 1963 ; Awad et al,1967; Sadek, 1965 and Ramadan et al, 1965].on the other hand, S. brazzavile, S. gottingen, S. lokstedt, S. israel and S. newbrunswick were not isolated before in animals in Egypt.

S U M M A R Y

The mesenteric lymph node and small intestine of 400 apparently healthy slaughtered camels were examined for salmonella. 60 camels were found to be infected, i.e. the incidence of infection was 15 %, A total of 64 salmonella isolates were recovered which could be serologically typed as S. heidelberg [21], S.newlands [17], chester [16], S. eastbourne [6] S. brazzavile [4], S. goettingen, S. typhi-murium [each 3 isolates] & S. Lokstedt [2] andS.israel, S. newport and S. newbrinswick, [one each].

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