

PREVALENCE OF *Campylobacter fetus* ORGANISM IN DIFFERENT FARM ANIMALS

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ABSTRACT

This study was designed as an attempt to isolate and identify the *Campylobacter* organisms prevalent in farm animals as well as studying their antibiotic sensitivity invitro to commonly used antibiotics. Three hundred and seventy three random samples were collected from cattle, buffaloes and sheep allover different private farms in Khalubia, Sharkia, Ismalia, El-Nobarea and Cairo abattoir to detect the possible existance of *Campylobacter fetus* in such specimens, cultural characters, morphological characters and biochemical criteria were done to identify the isolated strains.

The obtained data revealed the presence of *Campylobacter fetus subsp. venerealis* in cattle with an incidence of (11.73%) where 27 strains were obtained from 230 samples and it was (12.28%) as 7 isolates were recovered from 57 examinaed samples while *Campylobacter fetus* was isolated from sheep gall bladder with recovery rate of 4.65% as 4 isolates were obtained from 86 samples. The invitro antibiotics sensitivity test was done against the commonly used antibiotics and the obtained data proved that isolates of *Campylobacter fetus subsp. venerealis* were sensitive to nitrofurantion, erythromycin, trimethoprim, streptomycin, chloramphenical with activity of 100%, 97.05%, 97.50%, 91.17% and 85.29% respectively. While isolates of *Campylobacter fetus subsp. fetus* were sensitive to erythromycin, nitrofurantion, trimethoprim, streptomycin, and chloramphenicol with an activity of 100%, 75%, 75%, 50%, and 50%, respectively.

INTRODCTION

Campylobacteriosis is widely spread diseaseae in many countries in the world and chareterized by infertility and sporadic abortion (Garcia *et al.*,1983). *Campylobacter fetus subspecies venerealis* is an important cause of abortion and infertility in cattle and subspeies fetus is a cause of abortion in sheep (Maclaren and Wright, 1977).

Bovine gental campylobacteriosis is a disease generally caused by *Campylobacter fetus subspecies venerealis* and occasionally by the Subspecies fetus; (Maclaren and Agumbah,1988).

Nowdays, there has been interest in promoting the reproductive and productive potentials of local dairy breeds. It is well known that a large fraction (30-40%) of national dairy herd is infertile. Putting us in a direction that the strategic policy for the reproductive mapping must give a special consideration to such infectious microorganisms.

Our study was planned to throw lights upon the prevalence of *C.fetus* in farm animals, trails for isolation and identification and Studying their antibiotics susceptibility pattern to choose the highly potent ones recommended to eliminate such infection.

MATERIAL AND METHODS.

1- Samples collection.

Three hundreds and seventy three random samples were collected from cattle, buffaloes and sheep, in a trail to explore the possible existence of *Campylobacter*. Type number and locality of samples as in Table (1). Samples were collected as described by (Merchant and packer, 1971).

Table (1) : Samples collected from farm animals at different localities.

Animal species and type of Samples Locality	Cattle			Buffaloes			Sheep
	Preputal wash	Aborted foeti	Uterine discharge	Preputal wash	Aborted foeti	Uterine discharge	Gall bladder
Khalubia	4	2	8	0	1	6	-
Sharkia	13	20	63	2	3	13	-
Ismailia	12	16	55	2	4	12	-
El-Nobarea	1	4	32	3	3	8	-
Cairo-abattoir	-	-	-	-	-	-	86
Sum	30	42	158	7	11	39	86
Total	230			57			86

2- Isolation procedures: This was performed according (Simbert,1984). supernatant of centrifuged preputal washings, vaginal discharges, uterine and faetal membrane scrapings and stomach contents of aborted foeti were inoculated in tubes of semisolid thiol medium and streaked over blood agar plates. Incubation was done at 25' C-37' C and 42' C in an microaerophilic atmosphere of 5% O₂, 10% CO₂ and 85% N₂. for 48-72 hrs. plates were also aerobically incubated to exclude aerotolerant organisms. Typical colonies of *Campylobacter* organisms were picked and streaked over blood agar or brain heart infusiom or brucella agar plates to obtain single colonies.

3- Identification procedures: were carried out according to method mentioned by (Krieg and Holt, 1984) through the following scheme.

a- Colonial morphology :

Shape, colour, size, circumference using disecting microscope.

b- Microscopical examination :

Smears were stained with both Gram and modified Ziehl-Neelson Stains.

c- Detection of motility :

By deep stabling into semisolid thiol medium and incubation at 37' C.

d- Typical growth ring :

In semisolid thiol medium the organism showed a characteristic umbrella on ring from of growth about 0.5 mm below the surface of medium (Neill ef al., 1980).

e- Temperature tolerance :

By incubation at 25' C, 37' C and 42' C to detect their temperature tolerance.

f- Biochemical reactions through :

1-Catalase activity (Laing, 1960).

2-Hydrogen sulphide production (Bryner and Frank, 1955 and Walsh and White, 1988).

3-Growth in media Containing 3.5% sodium chloride.

4-Growth in media Containing 1% glycine.

5-Antibiogram of the isolated *C. fetus* strains.

as described by Finegold and Martin (1982). Using the following antibiotic discs :- Chloramphenicol (30 ug), Erythromycin (15 ug) Gentamycin (10 ug), Nitrofurantion (300 ug), Streptomycin (10 ug) Tetracycline (30 ug), Trimethoprim sulphamethoxazole (25 ug), Lincomycin (30 ug).

RESULTS AND DISCUSSION

The obtained data revealed that three isolates of *Campylobacter* organisms were obtained from cattle preputal washes with a total incidence of (10%), from 42 samples of cattle aborted foeti 14 isolates of *Campylobacter* organisms were obtained with a total incidence, of (33.33%). From 158 samples from cattle uterine discharge, 10 isolates were obtained with a total incidence of (6.32%). Concerning the samples of buffaloes preputal washes, they gave only one isolate with incidence of (14.29%). From eleven samples brought from buffaloes aborted foeti yielded two *Campylobacter* isolates with total incidence of (18.18%), 39 samples from uterine discharge revealed 4 *Campylobacter* isolates with total incidence of (10.25%). Concerning sheep gall bladders samples 4 isolates were obtained from 86 samples with incidence of (4.65%) as shown in table (2) our results proved that the incidence of *Campylobacter* organisms among cattle was (11.73%) as 27 isolates were obtained from 230 examined cattle specimens, while it was (12.28%) for buffaloes, as 7 isolates were recovered from 57 buffaloes samples and it was (4.65%) in sheep as 4 isolates were obtained from 86 examined sheep. These findings were nearly similar to those mentioned by Khalid (1986) who isolated *Campylobacter* organisms from different farms of various Governorates with incidence of (10.46%) for cattle; (15.27%) for buffaloes and 4% for sheep. While Hefnawy *et al.* (1988) isolated 10 isolates of *Campylobacter* microorganisms from slaughtered sheep and buffaloes with incidence of (16.67%), Also Garcia *et al.* (1985) recorded higher incidence 50% of *Campylobacter* present in carcasses of sheep.

Results of identification of 38 *Campylobacter* organisms revealed that 34 isolates were verified as *Campylobacter fetus subspecies venerealis* from cattle and 4 isolates were belonged to *Campylobacter fetus subspecies fetus* from sheep according to the morphological, cultural and biochemical characters Table (3) such data go hand in hand with those reported by Wahbah *et al.* (1984) who isolated *Campylobacter fetus subspecies fetus* from Egyptian buffaloes, on the other hand, Khalid (1986) isolated 27 isolates from cattle, 11 from buffaloes and 4 from sheep and were identified biochemically as *Campylobacter fetus subspecies venerealis*. Also he found that 10 isolates of bovine origin and 4 of ovine origin were related to *Campylobacter fetus subspecies fetus*.

With regard to the antibiotic sensitivity as shown in table (4) *Campylobacter fetus subsp. venerealis* were sensitive to nitrofurantion, erythromycin, trimethoprim, streptomycin, and chloramphenicol with percentage of 100%, 97.05%, 97.05%, 85.71%, and 85.29%, respectively. Such results simulated that reported by Vanhoof *et al.* (1982) who proved that *Campylobacter* isolates were highly susceptible to antimicrobial agents including gentamycin, nalidixic acid, erythromycin, and tetracycline.

Table (2) Incidence of positive Samples of Campylobacter micro-organisms in different examined animals from different localities.

Animal species	Cattle											
	Preputial wash				Aborted foeti				uterine discharge			
Locality	No. of examined samples	+ve samples	Percentag %	No. of examined samples	+ve samples	Percentag %	No. of examined samples	+ve samples	Percentag %	No. of examined samples	+ve samples	Percentag %
Khalubia	4	1	25	2	1	50%	8	0	0			
Sharkia	13	1	7.69	20	4	20%	63	4	6.34%			
Ismailia	12	1	8.33	16	8	50%	55	5	9.09%			
El-nobarea	1	0	0	4	1	25%	32	1	3.12%			
Cairo Abattor	-	-	-	-	-	-	-	-	-			
Total	30	3	10%	42	14	33.33%	158	10	6.32%			

Animal species	Buffaloes											
	Preputial wash				Aborted foeti				Uterinedisharge			
Locality	No. of examined samples	+ve samples	Percentag %	No. of examined samples	+ve samples	Percentag %	No. of examined samples	+ve samples	Percentag %	No. of examined samples	+ve samples	Percentag %
0	0	0	0%	1	0	0%	6	1	16.66%			
2	0	0	0%	3	1	33.33%	13	2	15.38%			
2	1	50%	50%	4	1	25%	12	0	0%			
3	0	0	0%	3	0	0%	8	1	12.5%			
-	-	-	-	-	-	-	-	-	-			
7	1	14.28%	14.28%	11	2	18.18%	39	4	10.25%	86	4	4.65%
Total										86	4	4.65%
										38	4	10.18%

Table (3): Characters of *Campylobacter fetus subsp. venerealis* and *Campylobacter fetus subsp. fetus*.

Characters	<i>Campylobacter fetus subsp. venerealis</i>	<i>Campylobacter fetus subsp. fetus</i>
1- Morphology	Pleomorphic	Pleomorphic
2- Incubation atmosphere :-		
- Micro aerophilic	+ ve	+
- Aerobic	- ve	- ve
- Anerobic	- ve	- ve
3- Deep stab growth	- ve	- ve
4- Temperature tolerance :-		
- Growth at 25°C	+ ve	+ ve
- Growth at 37°C	+ ve	+ ve
- Growth at 42°C	- ve	- ve
5- Catalase activity	+ ve	+ ve
6- H ₂ S production	- ve	+ ve
7- Growth in media containing 3.5% NaCl	- ve	- ve
8- Growth in media containing 1% glycine	- ve	+ ve

Table (4): Antibiotic sensitivity pattern of the isolated strains of *Campylobacter fetus subsp. venerealis* and *subsp. fetus*.

Antibiotic	Disk potency	<i>C. fetus sub sp. venerealis</i> (34)		<i>C. fetus sub sp. Fetus</i> (4)	
		No. of sensitive strains	% of activity	No. of sensitive strains	% of activity
Chloramphenicol	30 ug	29	85.29	2	50
Erythromycin	15 ug	33	97.05	4	100
Gentamycin	10 ug	20	58.82	0	0.00
Nitrofurantion	300 ug	34	100	3	75
Teteracyclin	30 ug	18	52.94	1	25
Streptomycin	10 ug	31	91.17	2	50
Trimethoprim	5 ug	33	97.05	3	75
Lincomycin	30 ug	13	38.23	0	0.00

Concerning *C. fetus subsp. fetus*, it was sensitive to erythromycin, nitrofurantion, trimethoprim, streptomycin, chloramphenicol and teteracyclin with percentage of 100%, 75%, 75%, 50%, 50%, & 25% respectively. These data were in disagreement with those of Shisong *et al* (1990) who reported that *C. fetus subsp. fetus* was sensitive to lincomycin, spectinomycin and penicillin.

REFERENCES

- Bryner, J.H. and Frank, A.H. (1955). Apreliminary report on the identification of *Vibriofetus*. Am.J.Vet. Res. 16:73-78.
- Finegold, S.M. and Martin, W.J. (1982) : Bailey and scotts diagnostic microbiology- 6th ed., The C.V. mosby company, st. louis, Toronto, london.
- Garcia, M.M.; Eaglesome, M.D. and Rigby, C. (1983) *Campylobacter* important in Veterinary medicine. Veterinary Bulletin 53, 793- 818.
- Garcia, M.M.; lior, H.; Stewart, R.B.; Ruckerbauer, G.M.; Trudel, J.R.R. and Skljaerovski, A. (1985). Isolation, characterization and serotyping of *Campylobacter Jejuni* and *Campylobacter coli* from slaughtered cattle. Apple Environ. Microbiol. 49:667-672.
- Hefnawy, Y.; Sabah, M. and Fathi, S. (1988) : *Campylobacter fetus sub sp. Jejuni* in intact sheep and buffaloe carcasses. Assiut vet. Med. J. (1989), 22, (43) :106-112.

- Khalid, A.M. (1986) : Investigations of the biochemical and serological properties of *Campylobacter* species isolated from farm animals. Ph.D. Thesis Microbiology, Fac. Vet. Med. Zagazig Univ. (Banha Branch).
- Krieg, N. and Holt, J. (1984). *Bergey's manual of systematic Bacteriology* 8th ed. Williams and Wilkins, Baltimore, London.
- Laing, J.A. (1960) : *Vibrio fetus* infection in cattle. FAO. Agric. Stud. No.51.
- Maclaren, A.P.C and Agumbah, G.J.D. (1988). Infertility in cattle in south-west scotland caused by intermediate strain of *Campylobacter fetus sub sp. fetus* (formerly *Campylobacter fetus intestinalis*). *British veterinary J.* 144(1) . 29-44.
- Maclaren, A.P.C. and Wright, C.L. (1977). *Campylobacter fetus* (vibrio fetus) infection in dairy herds in south-west scotland. *Vet. Rec.* 110:463-464.
- Merchant, L.A. and Packer, R.A. (1971). *Veterinary Bacteriology and Virology* Iowa stste Univ. press Ames. Iowa. U.S.A.
- Neill, S.D.; O'Brien, J.J. and Ellis, W.A. (1980). The isolation of aerotolerant *Campylobacter*. *Vet. Rec.* 106:152-155.
- Shisong, C.; Redwood, D.W. and Ellis, B (1990). Control of *Campylobacter fetus* in artificially contaminated bovin semen by incubation with antibiotics before freezing. *British Vet. J.* 146:68- 74.
- Simbert, R.M. (1984). "Genus" *Campylobacter* Sebald and veron, 1963, 907 in *Bergey's Manual of Systemic Bacteriology* Edited by Edited by Krieg, N.R. and Nolt, J.G 9th Edit. Williams and Wilkins, Baltimore, pp.111-117.
- Vanhoof, R.;Goossens, H. and Stas, G. (1982) Susceptibility pattern of *Campylobacter jejuni* from human and animals to different antimicrobial agents. *Antimicrobial Agents and chemotherapy*, 21(6): 990-992.
- Wahbah, M.A.; Rakia, A.M. and El-seryany; M.A. (1984) Histopathological changes associated with vibronic infection in buffaloes. 2nd conf. A.R.C. Giza 9-11 April .
- Walsh, A.F. and White, F.H. (1988). Biochemical and serological characteristics of *Vibrio* isolants from cattle. *Am. J. Vet. Res.* 29:1377-1382.

تواجد ميكروب الكامبيلوباكتري الجيني في حيوانات المزرعة المختلفة

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استهدفت هذه الدراسة عزل وتصنيف ميكروبات الكامبيلوباكتري الجيني من بعض حيوانات المزرعة بغرض معرفة مدى احتمال تواجدها في الحيوانات بالإضافة إلى دراسة حساسية هذا الميكروب للمضادات الحيوية بغرض السيطرة على هذا الميكروب المسبب للإجهاض والمقم وقلة الخصوبة في حيوانات المزرعة.

تم جمع عدد ٣٧٢ عينة من الأبقار - الجاموس والأغنام مرعاة في مناطق مختلفة بمحافظة القليوبية والشرقية والإسماعيلية ومنطقة غرب النوبارية ومن مجازر القاهرة لعزل ميكروب الكامبيلوباكتري على المنابت المناسبة وتحت ظروف مهيئة لنموه. تم تصنيف الميكروب تبعاً للحركة المميزة وكذلك الصفات المرفولوجية للمستعمرات والخواص الفيوكيميائية.

ومن نتائج الدراسة تبين وجود ميكروب الكامبيلوباكتري الجيني تحت صنف التماسلي بنسبة ١١,٧٣% في الأبقار حيث تم عزل ٢٧ عينة من جملة العينات المفحوصة وهي ٢٣٠ عينة بنسبة ١٢,٢٨% من الجاموس حيث تم عزل ٧ عزلات من جملة العينات المفحوصة وهي ٥٧ عينة. أما العزلة الثانية وهي الكامبيلوباكتري الجيني تحت صنف الجيني فقد عزلت من الحويصلة المرارية للأغنام بنسبة ٤,٦٥% حيث لم تكن عزل ٤ عزلات من جملة العينات المفحوصة وهي ٨٦ عينة وبإجراء اختبار حساسية هذه المعزولات معصلاً للمضادات الحيوية ثمانية الاستعمال أوضح أن الكامبيلوباكتري الجيني تحت صنف التماسلي كان حساساً لكل من نيتروفورنتين، إيرثروميسين، تراسي ميثوبريم، سترتوميسين، والكلورامفينكول بنسبة فاعلية ١٠٠%, ٩٧,٠٥%, ٩٧,٠٥%, ٩١,١٧% و ٨٥,٢٩% على التوالي. وباختبار حساسية ميكروب الكامبيلوباكتري الجيني تحت صنف الجيني كان حساساً لكل من نيترومييسين، نيتروفورنتين، تراسي ميثوبريم، سترتوميسين، الكلورامفينكول بنسبة فاعلية ١٠٠%, ٧٥%, ٧٥%, ٥٠%, ٥٠%, على التوالي.