

BACTERIOLOGICAL AND PATHOLOGICAL STUDIES ON CAMPYLOBACTERIOSIS IN DUCKS AT SHARKIA PROVINCE

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ABSTRACT

One hundred and Twenty ducks, 1 to 32 weeks old, suffering from symptoms of diarrhoea were collected from different farms at Sharkia province representing 20 flocks, were subjected to clinical and postmortum examination. Bacterial isolation were carried out on examined birds. The study revealed that six bacterial isolates of *C. jejuni* were isolated. The isolates were morphologically and biochemically identified. The incidence of campylobacter infection in ducks was 5%. campylobacter *jejuni* six isolates were biotyped as biotype I (5), and biotype Ia (1) isolates.

The experimental infection with bacterial isolates on 30 days old ducks was carried out. The morbidity and mortality were 80% and 10%. Respectively.

The histopathological studies in the affected organs of infected ducks were reported. All campylobacter *jejuni* isolates were found highly sensitive to gentamycin, flumequinone, oxytetracycline and trimethoprim.

INTRODUCTION

Nowadays ducks farms had been spread widely all over Egypt particularly during the last decade where high percentage of protein can be produced from ducks at a short time in comparison with chicken.

The genus campylobacter species and specifically campylobacter *jejuni* was the predominant species is causing a disease in both breeding and commercial flocks of chickens, turkeys and ducks (Shane 2000).

Campylobacter has emerged as significant infection in a wide range of avian and mammalian species (Stern, 1989 and Shane, 1991).

Campylobacter is the cause of contagious disease of chicken and ducks characterized by low

mortality, high morbidity and chronic course. The disease is associated with significant reduction in egg production (**Sevoian et al 1958 and Peckham, 1984**).

Poultry are considered as a source of human infection from which the organism gained its zoonotic importance (**Grant et al 1980**). However, little information is known about naturally occurring campylobacter infection on ducks.

The aim of this work was carried out to investigate the current status of campylobacteriosis in ducks among duck farms in Sharkia province.

MATERIAL AND METHODS

Material

Specimens :

- 1- In the course of this investigation a total number of 120 birds were subjected to examination.
- 2- Experimental birds: 50 balady ducks 30 day old obtained from balady hatchery to study pathogenicity of campylobacter organism in ducks.
- 3- Media:
 - Thioglycolate broth (**Bisping, 1974**).
 - Brucella Sheep blood agar (**Martin et al., 1983**).
- 4- Antibacterial Sensitivity disk produced by Oxoid.

Methods:

- 1- Clinical and postmortem examination.
- 2- Campylobacter isolation according to (**Kwialck et al., 1990**).
- 3- Bacterial identification according to (**Rosef and yndestad 1982 and Carter 1984**).
- 4- Pathogenicity of *C. jejuni* to 30 day old ducks. Ducks classified into 2 equal subgroups. First group were inoculated orally with 1ml (10^9) of live cells of *C. jejuni* strains, the 2nd group kept as control. All birds kept under observation for 14 days. The mortality, morbidity, symptoms, postmortem lesions were recorded daily. Intestinal and cecal content from dead ducks were cultured.
- 5- Histopathological examination: specimens from liver, intestine, spleen and heart were col-

lected and fixed in 10% formaline and were examined according (Lillie, 1948) and (Drury) and (Wallington, 1980).

RESULTS

Bacterial Isolation: Six isolates could be isolated from examination of 120 ducks represented of 20 flocks of Ducks from Sharkia Province examination were six isolates.

- Six isolates could be identified morphologically on cultural basis as campylobacter colonies were revealed small, moist transparent Gram negative and curved rods.
- Biochemical assays carried out showed that the six isolates identified biochemically were *C. jejuni*. (table. 2)
- Biotyping of *C. jejuni* revealed that the isolates belonged to 2 biotypes (5 biotype 1 and 1 strain to biotype Ia (table. 3).
- Pathogenicity Trial of *C. jejuni* to ducks revealed short incubation period 24-72h, depression, diarrhea and lose weight. mortality rate 40% and morbidity 80% (table. 4).
- Histopathological results.

Intestine : desquamated epithelial cells of the intestinal villi have been observed. Ulceration of intestinal mucosa together with presence of haemorrhagic exudate had been detected intestinal lumenae. (Fig. 1) Free erythrocytes together with necrotic epithelial cells and inflammatory leukocytes were seen. (Fig. 2) .

Liver : focal coagulative necrosis was surrounded with macrophages and lymphocytes were seen (Fig. 3) Focal aggregation of macrophages, heterophils and some lymphocyte replaced the destroyed hepatic parenchyma was noticed (Fig. 4) Moreover hyalinized thrombs had been seen in some blood vessels (Fig. 5) .

Heart : multiple focal myomalacia of the myocardial muscles together with activation of histiocytes (Fig.6) Focal interstitial haemorrhage had been detected in between the myocardial bundles (Fig. 7).

Spleen : Heterophilic infiltration in both white and red pulbs been detected (Fig. 8) .

In vitro sensitivity of *C. jejuni* isolates to antibacterial agent were used. The result are shown in (table, 5).

DISCUSSION

Campylobacter infection in poultry results in sever economic losses due to poor weight gain (Sevolan et al., 1958).

In present study, ducks naturally infected with C.jejuni showed clinical signs in the liver lesions were mainly haemorrhagic patches and enlargement of some affected livers. Necrotic foci were found in the livers too. Enlargement of spleen and kidneys were also observed. There were similar lesions were described for campylobacter infection by (Sevolan et al., 1958 and Peckham 1984).

* Isolation of C.jejuni showed that only six C.jejuni strain out of 120 examined cases were positive with incidence 5% while other incidence percentage recorded were 19% by Salem et al. (1986). The variation in percent low value of isolation success due to wide use of prophylactic medication.

Campylobacter isolation from internal organs showed intestine, gall bladder and liver were suitable for isolation similar result were obtained by **Shane, 2000**.

* Inoculation of C.jejuni isolate to 30 days old ducks showed that post mortum finding were confined to liver, spleen, kidney and heart similar finding were reported by **Garcia et al (1983)**.

Histopathological changes observed in internal organs similar findings were observed by (**Wenhan et al, 1981 and Savova and Samatove, 1974**).

In conclusion. Frequency of campylobacter infection in ducks farms was low. Gentamycin, flumequine oxytetracycline and trimethoprim were effective for control of ducks infected with C.jejuni.

Table (1) : Culture characteristics identification of suspected caympylobacter.

Isolate	Growth temp.			Arob. growth	Anarobic growth	Growth in 5% oxygen	Motility
	25 C ⁰	37 C ⁰	42 C ⁰				
1	-	+	+	-	-	+	+
2	-	+	+	-	-	+	+
3	-	+	+	-	-	+	+
4	-	+	+	-	-	+	+
5	-	+	+	-	-	+	+
6	-	+	+	-	-	+	+

Table (2): Biochemical identification of suspected campylobacter isolates .

Isolate No.	Catalase Test	Oxidase test	Glycine tolerance	H ₂ production leadacelate	Hippurate hydrolysis
1	+	+	+	+	+
2	+	+	+	-	+
3	+	+	+	+	+
4	+	+	+	+	-
5	+	+	+	+	+
6	+	+	+	+	+

Table (3) : Biotyping of *C.jejuni* isolates.

Isolates	Hippurate hydrolysis	Rapid H ₂ S	DNA hydrolysis	Biotype
1	+	-	-	1
2	+	-	-	1
3	+	-	-	1
5	+	-	-	1
4	+	-	+	1a
5	+	-	-	1
6	+	-	-	1

Table (4) results of oral infection with *C.jejuni* in thirty days old ducks.

Group no,	Number of bride	Dose/brides	Routs	Result of experiment			
				Mortality	Morbidity	PM	Reisolation
Group 1 (infected group)	25	10 ⁹ cfu	Orally	12/28	6/25	Small necrotic focol of liver	4/5
Group 2 (control)	25	-	-	-	-	-	-

Table (5) Result of invitro sensitivity testing of isolation C.jejuni strain.

Antimicrobial agent	Disk potency	Standerd sensitivity zone	
Gentamycin	10ug	>15>19	+++
Naldixic acid	3ug	>16>19	++
Flumequien	30ug	>13>18	+
Neomycin	30ug	>15>19	+
Chollstine	30ug	>13>18	+++
Oxytetracycline	30ug	>14>18	++
Trimethoprim	1.25 + 2375 ug	>11>15	+++
Kanamycine	30ug		R
Ampicillin	30ug		R
Novoblocin	30ug		R

+++ = high sensitive ++ = intermediate R = Resistance

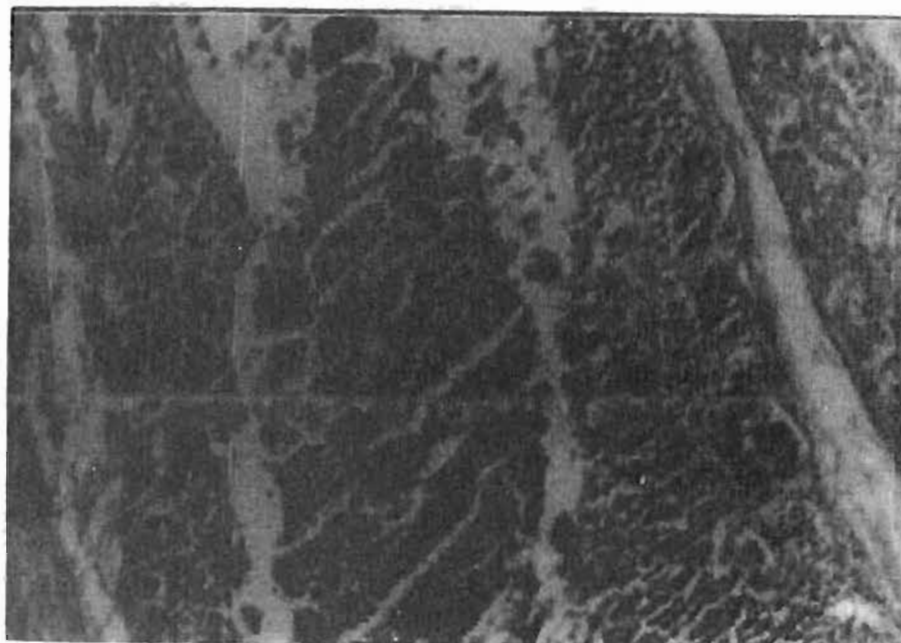


Fig. 1 : Intedline showing mucosal ulceration and haemorrhagic exudate in the lumen H & E x 150.

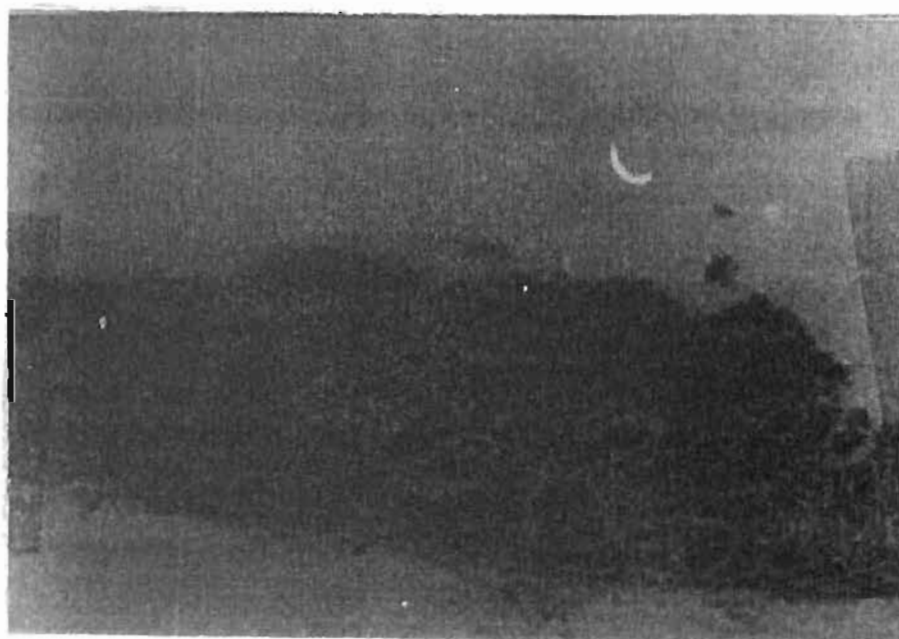


Fig. 2 : Intedline showing ulceration of the Intestinal mucosa with heavy infiltration of leukocytes in lamina propria and haemorrhage with necrotic debris in the lumen H & E x 150.

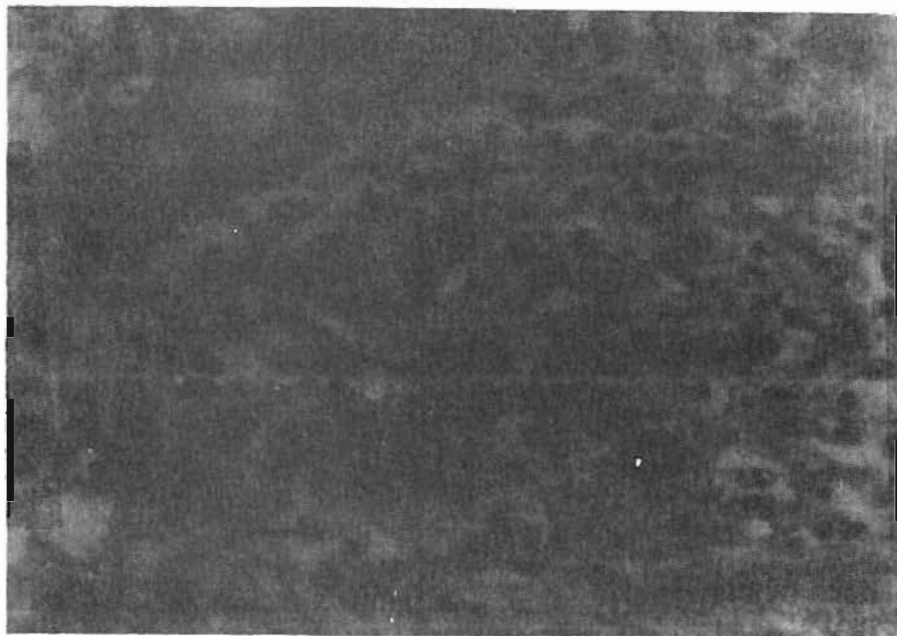


Fig. 3 : Liver showing coagulative necrosis surrounded with macrophages and lymphocytes. H & E x 600.



Fig. 4 : Liver showing focal aggregation of macrophages, heterophils and some lymphocytes replaced the destroyed hepatic parenchyma H & E x 600.



Fig. 6 : Liver showing recent thrombi in the blood vessels H & E x 600.



Fig. 6 : Myocardium showing focal myomalacia together with activation of histiocytes. H & E x 600.

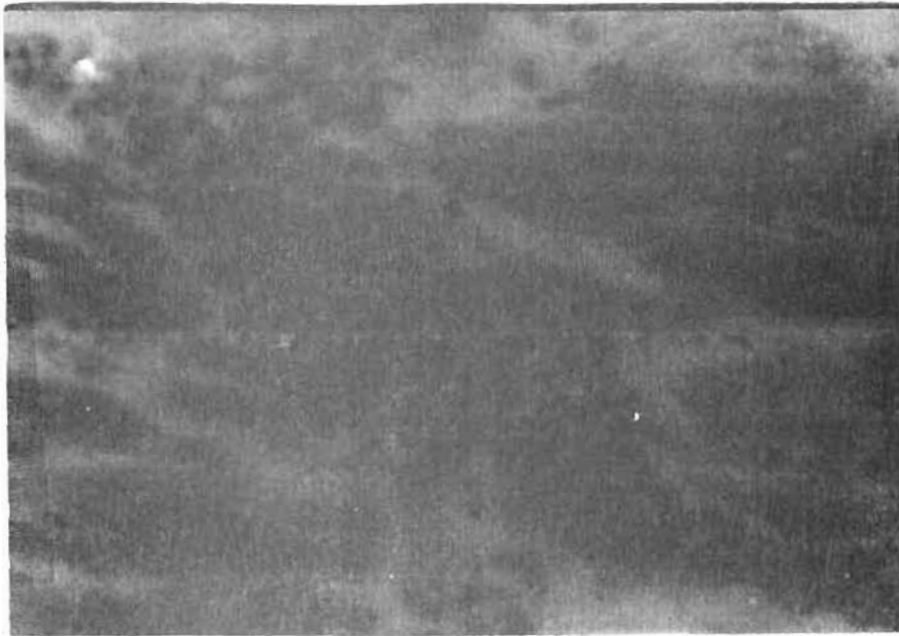


Fig. 7 : Heart showing focal interstitial haemorrhage between the myocardial bundles H & E x 600.

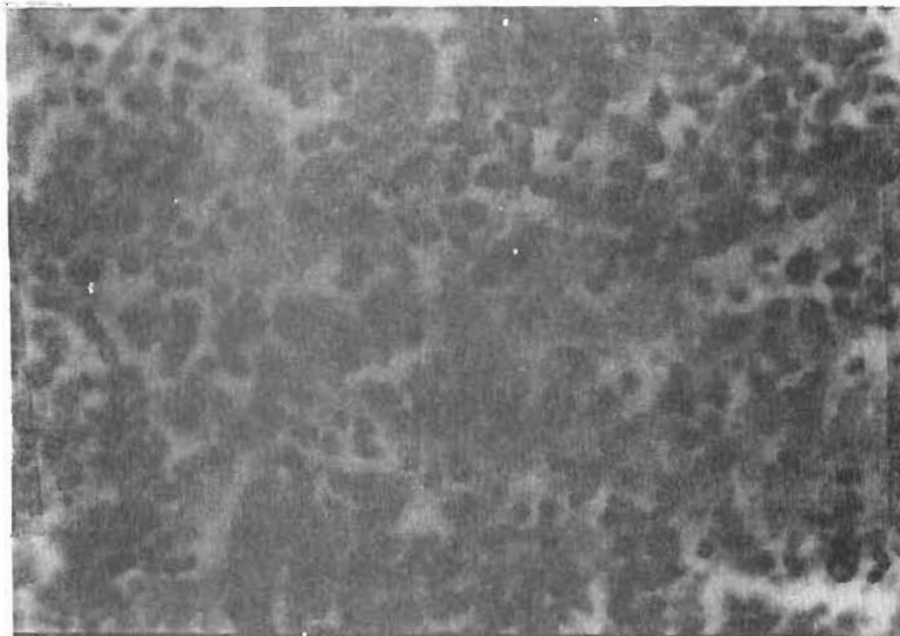


Fig. 8 : Spleen showing heterophilic infiltration in both white and red pulps. H & E x 600.

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الملخص العربي

دراسات بكتريولوجية وباثولوجية على ميكروب الكامبيلوبكتري
في البط بمحافظة الشرقية

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تم تجميع مائة وعشرون بطة تتراوح أعمارها بين إسبوع و ٣٢ إسبوع يعاونون من أعراض الإسهال ويمثلون ٢٠ قطع بمحافظة الشرقية، تم فحص البط إكلينيكياً وإجراء الصفة التشريحية والعزل البكتريولوجى والفحص الهستوباثولوجى للأعضاء المصابة.

أظهرت الدراسة ٦ معزولات من الكامبيلوبكتري جوجوناى وتم التعرف عليها من خلال الشكل الظاهرى والتفاعلات البيوكيميائية.

كانت نسبة الإصابة فى البط ٥٪ كما تم تصنيف البكتريا المعزولة إلى بيوتايب ١ (٥ معزولات) وبيوتايب La (معزول واحد).

تم إحداث العدوى المعملية بالكامبيلوبكتري جوجوناى فى بط عمر ٣٠ يوم وكانت نسبة الإصابة والنفوق هى ٨٠٪، ١٠٪ على التوالى وتم وصف التغيرات الهستوباثولوجية فى أعضاء البط المصاب.

أظهرت الدراسة أن جميع البكتريا المعزولة كانت عالية الحساسية للهنتراميسين والفليموكورين والأوكسى تتراسيكلين والتراميثوبريم.