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Research Paper

OCCURRENCE OF CAMPYLOBACTER JEJUNI/COLI IN POULTRY FARMS IN OSOGBO METROPOLIS

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This study was conducted to establish Campylobacter infection among animals in Osogbo. 200 chicken rectal swabs were collected from ten different poultry farms in Osogbo metropolis. The isolates were also subjected to the antimicrobial sensitivity testing. Twenty (10%) of the samples were positive for Campylobacter. Sixteen (80%) were found to be *Campylobacter jejuni* and 4(20%) to be *Campylobacter coli*. All the isolates exhibited varying degree of sensivity to the antimicrobial agents with ciprofloxacin (90%) appeared to be the most potent and cotrimozale not effective.

Keywords: Campylobacter, Chickens, Antibiotics

INTRODUCTION

Campylobacters are found to be associated with animal and human diseases (Adegbola and Akinkuade, 1991). In animals, they cause embryonic death, the most common human disease caused by Campylobacters is acute gastroenteritis (Smibert, 1978).

A collective name for infectious disease caused by members of these bacteria is called Campylobacteriosis. (Coker *et al.*, 2002). Most infections are caused by *Campylobacter jejuni* and *Campylobacter coli* although in the developing world *C. upsaliensis* is also important.

Treatment with antibiotics for uncomplicated *Campylobacter* infection is rarely indicated. It is usually cleared up on their own but sometimes are treated with electrolyte replacement and rehydration therapy. There is evidence that patients infected with antibiotic-resistant strains suffer worse outcomes (invasive illness or death) than those infected with sensitive strains (Helms *et al*., 2005). Antibiotics have a role in reducing the symptoms of campylobacteriosis because they shorten the span of illness and control its transmission in the community.

MATERIALS AND METHODS

The chicken rectal swabs were collected with the use of sterile swab sticks. It was ensured that the swab sticks were properly and gently inserted to the recta for about 10seconds.The samples collected were quickly inoculated on Brucella type media using a direct plating method. They were

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incubated at 42°C in an atmosphere of reduced oxygen (5-10%) with carbon dioxide about 10% and with 85% of nitrogen in an anaerobic jar for 72 hrs before they were discarded. Biochemical tests like catalase, oxidase, urease, hippurate hydrolysis, nitrate test and hydrogen sulphide production were carried out. Antibiotics susceptibility test was also performed using Kirby Bauer disc diffusion method for *in vitro* susceptibility testing was employed in this study. Media plates containing different colonies were inoculated and incubated. The innoculum compared with 0.5 Macfarland standard.

Both gram negative antibiotic dics were placed onto the inoculated agar plates. All plates were incubated in candle extinction jars at 42^0 C for 48 hrs.

The diameters of zones of inhibition were measured to the nearest millimeter using a ruler. The zones of inhibition of the test strains when comparable with the zone of inhibition of control organism were interpreted as sensitive, while those showing no zones of inhibition or narrower zones of inhibition than those of sensitive control organisms were interpreted as resistant.

RESULTS

Two hundred chicken rectal swabs were collected from different poutry farm in Osogbo metropolis. Twenty samples were collected from each farm at a time. Twenty (10%) of these samples gave gram- negative curved organism and the number of isolates obtained from each batch were shown in Table 1 of the twenty gram negative curved organism, 16(80%) were found to be *C. jejuni* while 4(20%) to be *C. coli* in Table 2 .

The antimicrobial sensitivity pattern of these isolates Table 3 showed that all the isolates exhibited varying degree of sensitivity to the antimicrobial agents with ciprofloxacin being the most potent. The antimicrobial sensitivity pattern is as follows: ciprofloxacin (90%), erythromycin (85%), gentamycin (80%), steptomycin (80%),

Table 1: The Number of Isolates from Each Poultry Farm

Poultry Farms	No of Samples Collected	No of Isolates
I	20	0
II	20	5
III	20	3
IV	20	3
V	20	5
VI	20	0
VII	20	2
VIII	20	1
IX	20	0
X	20	1
	200	20

Table 2: Summary of the Characterization of the Twenty Gram-Negative Curved Organisms Using Biochemical Tests

S. No.	Motility	Urease	Oxidase	Catalase	Hippurate	Nitrate Reduction	H_2S Production	VP	MR
1.	+	–	+	+	+	+	–	–	–
2.	+	–	+	+	+	+	–	–	–
3.	+	–	+	+	+	+	–	–	–
4.	+	–	+	+	–	+	–	–	–
5.	+	–	+	+	+	+	–	–	–
6.	+	–	+	+	–	+	W	–	–
7.	+	–	+	+	–	+	–	–	–
8.	+	–	+	+	+	–	–	–	–
9.	+	–	+	+	+	+	–	–	–
10.	+	–	+	+	+	+	–	–	–
11.	+	–	+	+	+	+	–	–	–
12.	+	–	+	+	+	+	–	–	–
13.	+	–	+	+	+	–	–	–	–
14.	+	–	+	+	–	+	W	–	–
15.	+	–	+	+	+	+	–	–	–
16.	+	–	+	+	+	+	–	–	–
17.	+	–	+	+	+	+	–	–	–
18.	+	–	+	+	+	+	–	–	–
19.	+	–	+	+	+	+	–	–	–
20.	+	–	+	+	+	+	–	–	–

Note: KEY: W=weak, M= Methyl red test, VP= Voges-Proskauer

Table 3: Summary of Antimicrobial Susceptibility Testing

Antimicrobial Agents	Disc Potency	No of Sensitivity Strain(%)	No of Resistance Strain(%)
Augmentin	30μg	2(10%)	18(90%)
Amoxillin	30μg	0(0%)	20(100%)
Ampiclox	10μg	1(5%)	19(95%)
Ciprofloxacin	10μg	18(90%)	2(10%)
Chloramphenicol	30μg	11(55%)	9(45%)
Erythromycin	15μg	17(85%)	3(15%)

Table 3 (Cont.)

Antimicrobial Agents	Disc Potency	No of Sensitivity Strain(%)	No of Resistance Strain(%)
Gentamycin	10μg	16(80%)	4(20%)
Pefloxacin	10μg	15(75%)	5(25%)
Streptomycin	30μg	16(80%)	4(20%)
Septrin	30μg	0(0%)	20(100%)
Spafloxacin	10μg	15(75%)	5(25%)
Tarivid	10μg	0(0%)	20(100%)
Tetracycline	30μg	13(65%)	7(35%)
Nalidixic acid	30μg	17(75%)	3(15%)

sparfloxacin (75%), pefloxacin (75%), nalidixic acid (75%), tetracycline (65%) and chloramphenicol (55%).

All the isolates were resistant to amoxillin (100%), septrin (100%), tarivid (100%), ampiclox (95%), augmentin (90%), erythromycin (15%) gentamycin (20%), pefloxacin (25%), streptomycin (20%), spafloxacin (25%), tetracycline (35%), nalidixic acid (15%), erythromycin (15%) ciprofloxacin (10%), chloramphenicol (10%).

Twenty isolates were positive, gram negative curved organisms, they were all oxidase and catalase positive. Furthermore, all isolates were nitrate reduction positive except isolates 8 and 13 which were nitrate reduction negative and were suspected to be *C. jejuni* subspecies *doylei*. Sixteen isolates hydrolized hippurate (*C.jejuni*) while four isolates were found to be hippurates hyrodrolysis negative (*C. coli*). They do not produce H_2S. They were methyl red and Voges-Proskauer negative. In conformity with this, the study carried out by Amano *et al.,1992.*

The results obtained in the animal study showed that *C. jejuni* had the highest prevalence of 80% (16 of 20) and *C. coli* with 20% (4 of 20). This fact confirms with the study by de Wit *et al that C. jejuni* and *C. coli* are the two main species isolated in developing countries. The isolation rate of *C. jejuni* exceeds that of *C. coli*, similar to observations in most developed countries (de Wit *et al.,* 2001).

The antimicrobial susceptibility testing of these isolates showed that (85%) were sensitive to erythromycin and (90%) were sensitive to ciprofloxacin (90%). This conforms with the study by Engberg *et al.* which has shown that erythromycin and ciprofloxacin are drugs of choice (Engberg *et al*., 2001). In this study, only 10% of these strains were ciprofloxacin resistance. This can also be seen in various previous studies which stated that vaccination and drug therapy have been proposed as control measures although the use of antibiotics has resulted in the emergence of antibiotic-resistant *Campylobacter* strains all over the world (Allos, 2001). In a 1997 study conducted in Minnesota, 12 (20%) of 60 *C. jejuni* isolates obtained from chicken purchased in grocery stores were ciprofloxacin-resistant (Piddock,1995).

Experimental evidence demonstrates that fluoroquinolone-susceptible *C. jejuni* readily become drug-resistant in chickens when these drugs were administered (Jacobs - Reitsma *et al*., 1996).

In this study 5(25%) and 5(25%) of the isolates were resistant to Pefloxacin and Spafloxacin respectively which are example fluoroquinolones. Due to the resistance of these stains to the (macrolides and fluoroquinolones), this underlines the need to limit the use of antimicrobials in veterinary and medical clinical practice to limit the occurrence of resistance (Murray, 2002).

This study showed that 95% of strains of Campylobacter were sensitives to nalidixic acid which is an example of quinolones while only 5% were resistant to it. The isolates were also susceptible to aminoglycosides with 80% strains sensitive to gentamycin and 80% strains sensitive to streptromycin. In this study 100% of the isolates were resistant to septrin and (trimethoprim-sulfamethoxazole) and 100% of the isolates were resistant to amoxillin (an ampicillin family) also all the isolates were resistant to Tarivid (100%), followed by ampiclox (95%), augmentin(90%). This agreed with the study showed by Fabrega *et al.,* (2008) that trimethoprim-sulfamethoxazole and ampicillin were ineffective against *Campylobacter*.

CONCLUSION

For isolating Campylobacter species in the chicken that ordinarily serve as food for humans in this environment,proper preparation of these birds and their products should be emphasized to prevent transfer to human which may cause human campylobacteriosis.

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