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Research article

ANTIBIOTICS SUSCEPTIBILITY AND RESISTANCE PATTERNS OF CAMPYLOBACTER OBTAINED FROM HUMANS AND CHICKENS IN OSOGBO.

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ABSTRACT: Occurrence of gastroenteritis due to Campylobacter species has been established in both humans and chickens Osogbo. This study was done to compare antibiotic susceptibility and resistance patterns in both humans and chickens. Twenty three Campylobacter isolates were obtained from humans and twenty isolates from chickens. The isolates were also subjected to the antimicrobial sensitivity testing. All the isolates exhibited varying degree of sensivity to the antimicrobial agents with ciprofloxacin appeared to be the most potent and cotrimozale not effective in both humans and chickens.

Key words: Antibiotics, Campylobacter, Humans, Chicken.

INTRODUCTION

Campylobacters are found to be associated with animal and human diseases (Adegbola and Akinkuade 1991). In animals, they cause embryonic death and 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.Campylobacterosis is a self-limited disease and antimicrobial therapy is not generally indicated. However, treatment can decrease the duration and the severity of illness if it is initiated early in the course of infection (Murphy *et al*., 1996). Antibiotics have a role in reducing the symptoms, shortening the span of illness and controlling the transmission in the community (Vanhoof *et al*, 1978). Erythromycin, tetracycline and quinolones have all been recommended in different clinical settings to treat Campylobacter gastroenteritis (Vanhorfetal, 1978). Antimicrobial treatment (erythromycin, tetracycline or fluoroquinolone) can be used in invasive cases to eliminate the carrier state. Most clinical isolates of *C. jejuni* were resistant to ciprofloxacin and azithromycin.However, antimicrobial resistance to clinically important drugs used for treatment (especially macrolides and fluoroquinolones) is increasingly reported for Campylobacters. Although *Campylobacter* infections are usually self limiting, antibiotic therapy may be prudent for patients who have high fever, bloody diarrhea, or more than eight stools in 24 hours, immunosuppressed patients, patients with bloodstream infections, and those whose symptoms worsen or persist for more than 1 week from the time of diagnosis. When indicated, antimicrobial therapy soon after the onset of symptoms can reduce the median duration of illness from approximately 10 days to 5 days. When treatment is delayed (e.g., until *C. jejuni* infection is confirmed by a medical laboratory), therapy may not be successful (Blaster, 1990).

MATERIALS AND METHODS

Antibiotic Sensitivity Testing of isolates

Twenty three Campylobacter isolates were obtained from humans and twenty isolates from chickens.
They were subjected to the Kirby Bauer disc diffusion method for in vitro susceptibility testing. Media plates containing different colonies were inoculated and incubated.
The innoculum compared with 0.5 Macfarlandstandard.
Gram negative dics were placed onto the inoculated agar plates.
All plates were incubated in anaerobic jars at 42^0c for 48hours.

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Table 1: Antibiotics sensitivity pattern of twenty three Campylobacter isolates were obtained from humans.

Campylobacter		
Antibiotics	No of sensitivestrain (%)	No of Resistance strain (%)
Ampicillin 10µg	11(48%)	12(52%)
Streptomycin 10µg	12(52%)	11(48%)
Ciprofloxacin 5µg	23(100%)	0(0%)
Nalidixic acid 30µg	11(48%)	12(52%)
Erythromycin 10µg	23(100%)	0(0%)
Tetracyline 30µg	20(87%)	3(13%)
Gentamycin 10µg	19(83%)	4(17%)
Oflaxacin 5µg	6(26%)	17(74%)
Cotrimoazole 25µg	0(0%)	23(100%)
Nitrofurantoin 200µg	20(87%)	3(13%)
Ceftriaxone 30µg	13(57%)	10(43%)

Table 2: Summary of Percentage of Antimicrobial Susceptibility Testing of sensitive and resistance strains of twenty Campylobacter isolates from chickens.

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%)
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%)

Table: 3 Resistant Profiles of Human Campylobacter Isolates.

NO OF ANTIBIOTICS	RESISTANT PROFILE	NO OF ISOLATE	%
1	-	-	-
2	amp, cot	1	4.3
	cot, ofx,	1	4.3
	cot, tet	1	4.3
3	amp, cot, tet	2	8.7
	amp, tet, ofx	3	13.0
	amp, cot, chl	1	4.3
	amp, cot , ofx*	1	4.3
	cot, tet, ofx	1	4.3
	cot, tet, chl	2	8.7
4	amp, cot, tet, ofx**	3	13.0
	amp, cot, chl, strept	1	4.3
	amp, tet, strept, ofx	1	4.3
	cot, tet, chl, ofx	2	8.7
	cot, tet, strept, ofx	1	4.3
5	amp, cot, tet, strept, ofx	1	4.3
	amp, tet, chl, strept, ofx	1	4.3
Total		**23**	**100**

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Table: 4 Resistant Profiles of Animal Campylobacter Isolates.

NO OF ANTIBIOTICS	RESISTANT PROFILE	NO OF ISOLATE	%
1.	-	-	-
2	-	-	-
3	amp, cot, ofx*	4	20,0
4	amp, cot, tet, ofx**	7	35.0
	amp, cot, strept, ofx	2	10.0
	amp, cot, chl, ofx	1	5.0
5	amp, cot, tet, chl, ofx	3	15.0
	amp, tet, chl, strept, ofx	1	5.0
	amp, cot, chl, strept, ofx	1	5.0
6.	amp, cot, tet, chl, strept, ofx	1	5.0
Total		**20**	**100**

*** R** profile (to 3 antibiotic groups) shared by human and animal isolates
** R profile (to antibiotic groups) shared by human and animal isolates

DISCUSSION

The antimicrobial susceptibility testing of human isolates showed that (100%) were sensitive to ciprofloxacin and erythromycin, while in animals isolates (90%) were sensitive to ciprofloxacin and (85%) were sensitive to erythromycin . 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 10% of animal isolates 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 are 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. In the past, poultry infections were often treated by mass administration of enrofloxacin and sarafloxacin(fluoroquinolones) for single instances of infection. The FDA banned this practice, as it, instead of eliminating the bacteria, only promoted the development of fluoroquinolone-resistant populations (Murray, 2002). A major wide-rangedfluoroquinolone used in humans is ciprofloxacin.From the study all campylobacter isolates obtained from humans were susceptible to ciprofloxacin.This shows that ciprofloxacin is still a drug of choice in this environment. 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. This is in agreement with Fabrega*et al* that said that quinolones are effective if the organism is sensitive, but high rates of quinolone use in livestock means that quinolones are now largely ineffective (Fabrega*et al*., 2008).

The isolates were also susceptible to aminoglycosides with 80% strains sensitive to Gentamycin and 80% strains sensitive to Steptomycin.

In this study 100% of both the human and animal isolates were resistant to septrin(trimethoprim-sulfamethoxazole) while (100%) of animal isolates were resistant toamoxillicin and Tarivid, followed by Ampiclox(95%), Augmentin(90%). This agreed with the study showed by Fabrega*et al., (2008)* that trimethoprim-sulfamethoxazole and ampicillinare ineffective against *Campylobacter*. Three campylobacter isolates from humans and seven campylobacter isolates from animals were resistant to ampicillin, cotrimoxazole, tetracycline and ofloxacinwhile only one isolate from human and four isolates from animals were resistant to ampicillin, cotrimoxazole and ofloxacin. The resistant profile is high in animals and if humans consumed these chickens, there is a tendency that they get infected with these antibiotic-resistant strains.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). This underlines the need to limit the use of antimicrobials in veterinary and medical clinical practice to limit the occurrence of resistance.

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