

Table 4: Antibiotic resistance profile of *Campylobacter* species isolates

Serial no	Antimicrobial drugs	Concentration	Code	Drug susceptibility	<i>Campylobacter</i> species (n)%
1	Tetracycline	30µg	TET	Susceptible	21 (35)
				Resistant	39 (65)
2	Azithromycin	15µg	AZM	Susceptible	54 (90)
				Resistant	6 (10)
3	Chloramphenicol	30µg	CHL	Susceptible	26 (43.33)
				Resistant	34 (56.66)
4	Ciprofloxacin	5µg	CIP	Susceptible	51 (85)
				Resistant	9 (15)
5	Levofloxacin	5 µg	LEV	Susceptible	51 (85)
				Resistant	9 (15)
6	Ampicillin	10µg	AMP	Susceptible	18 (30)
				Resistant	42 (70)
7	Sulphamethoxazole + Trimethoprim	25 µg	SXT	Susceptible	24 (40)
				Resistant	36 (60)
8	Ofloxacin	5 µg	OFX	Susceptible	48 (80)
				Resistant	12 (20)
9	Clarithromycin	15 µg	CLR	Susceptible	30 (50)
				Resistant	30 (50)
10	Streptomycin	10 µg	STR	Susceptible	36 (60)
				Resistant	24 (40)
11	Gentamycin	10 µg	GEN	Susceptible	38 (63.33)
				Resistant	22 (36.66)
12	Amoxicillin	20 µg	AMX	Susceptible	12 (20)
				Resistant	48 (80)
13	Ceftriaxone	30 µg	CRO	Susceptible	57 (95)
				Resistant	3 (5)

AMP (47.4%), CIP (42.1%), Erythromycin (12.1%), GEN (25.6%), Nalidixic acid (46.4%) and TET (45.3%) resistance was observed by Mattheus et al. in a study done in Belgium (33). For Tetracycline 18.4% resistance and for Ampicillin 17.6% resistance was reported by Miflin et al. in a study done on *Campylobacter jejuni* (34). In *Campylobacter* species from broiler meat in South Africa Bester et al. observed highest resistance for Tetracycline and Ceftriaxone as 98.2% and 96.4% respectively (35). Extensive resistance

of *campylobacter* to various antibiotics including Lincomycin (51-100%), Ampicillin (33.3-60.2%) and Tetracycline (5.6-40.7%) have been observed in a study done by Obeng et al. (36). In a recent study done by Wiczorek et al. in poultry observed 92.5% resistance to Ciprofloxacin followed by 88.9% in Nalidixic acid and 68.4% in Tetracycline in Poland (37). In Poland another study done by Wysok et al. observed 52.7% resistance to Ciprofloxacin, 56% to Nalidixic acid and 61.3% to Doxycycline (38). All these previous studies along with current study give a clue of antimicrobial resistance in *Campylobacter* species in the world. The result difference might be due to variability in geographical location, change in climatic condition and use of different antibiotics in feeds of poultry and other animals.

3. Conclusion

Our Study conclude that *Campylobacter* species is highly prevalent in district Bannu. Potential source of *Campylobacter* might be raw meat from broiler and this can be a possible source of infection to people by consuming raw or not properly cooked meat. To most of the available antimicrobial agents, high percentages of resistance was observed and this might be due to use of antimicrobial agents for growth promotion or treatment in poultry. Hence it require quick attention of the concerned authorities for veterinary and public health as the diseases is zoonotic that could be hazardous to public health.

Conflict of interests

The authors declare no competing interests.

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