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STATUS OF INDISCRIMINATE USES OF ANTIBIOTICS IN LIVESTOCK AT NARAYANGANJ SADAR, NARAYANGANJ

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ABSTRACT

Antibiotic overuse, the prevalence of diseases, and the emergence of medication resistance are the main reasons why rash antibiotic use has attracted significant attention worldwide. By assessing the prescribers' patterns of prescribing antibiotics for patients, this cross-sectional survey-based study aims to represent a true picture of antibiotic use in Narayanganj Sadar, Narayanganj. It was conducted by making specific interviews with 60 farmers using a self-designed standard questionnaire. As a result of this study, we know that 38.3% of animals received antibiotic prescriptions, and that young animals (those age under 2 years old) received these prescriptions more frequently (53.8%). According to this study, the majority of antibiotics were used to treat microbial infections about 18 out of 23 animals (78.3%). Contrary to goat species, cattle species utilized antibiotics at a rate that is 6.69% greater. All prescriptions are for ceftriaxone (22%), marbofloxacin (18%), ceftiofur (4%), and ciprofloxacin (4%), in addition to amoxicillin (26%) and penicillin (26%). The13% of farmers had no idea how an antibiotic worked, how long it had lasted, or how to use it. About 69.5% of animals received prescriptions from non-registered veterinarians. It was obvious that farmers were not sufficiently aware of the usage of antibiotics, lacked adequate education and did not practice regarding drug usage policies in all situations. The spread of bacterial resistance to antibiotics and other health issues are caused by this illogical use. Therefore, community base awareness regarding the discriminate and indiscriminate use of antibiotics in livestock production.

Keywords: Antibiotics, livestock, antibiotics resistance, drug policy, awareness

INTRODUCTION

Specifically, pathogenic microorganisms are destroyed or slowed down in their proliferation by antimicrobials (Merriam-Webster *et al.*, 2022). Due to our better understanding of the underlying causes of numerous infectious diseases, the term "antibiotic" is now frequently used to describe a chemical substance, produced by micro-organisms, which has the capacity to inhibit the growth of and even to destroy bacteria and other micro-organisms. (Bentley, 2003) In veterinary hospitals globally, antibiotics are currently the most commonly administered medications because to their considerable contribution to life expectancy increases (Faryna *et al.*, 1987). However, improper and overuse of antibiotics results in increased drug resistance (Park *et al.*, 2012; Snow *et al.*, 2001; Hiramatsu *et al.*, 1997) which poses a direct threat to future animal health (Wise, *et al.*, 1998).

The main factor contributing to bacterial antibiotic resistance is genetic mutation. Due to the indiscriminate use of antibiotics in veterinary medicine, a high incidence of microorganisms resistant to antibiotics exists (Padmaja *et al.*, 2009). The likelihood that resistance will emerge is influenced by the length of exposure. In a developing nation like Bangladesh, the general people and veterinary experts are unaware of the usage of antibiotics. Bangladesh has made significant progress in drug formulation since the implementation of the "Drug Control Ordinance-1982" for drug manufacturing. However, unjustified self-medication, careless prescription, and irrational antibiotic use not only raise the risk of the emergence of resistant organisms but also drive up the cost of treatment (Biswas *et al.*, 2014). Many veterinary professionals and doctors in Bangladesh frequently write unreasonable antibiotic prescriptions without considering the findings of the clinical test. Additionally, farmers are not fully cognizant enough to finish the prescribed antibiotic dosages, especially in cases of major infectious diseases. The research on antibiotic prescription patterns may indicate that veterinary professionals assess, monitor, and suggest potential changes to the practitioner's prescription practices to ensure that

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patients receive effective and reasonable care (Shankar *et al.*, 2003). To address the issues brought on by the irrational use of antibiotics, it is vital to gather and disseminate knowledge on antibiotic usage. It is essential to create an antibiotic policy in veterinary hospitals and clinics and to ensure that individual prescribers follow best practices (Remesh *et al.*, 2013). A thorough and approved representative study may aid veterinarians in prescribing antibiotics sensibly and can raise the standard of patient care. The objectives of this survey-based research are to evaluate, investigate, and justify whether antibiotics are being prescribed irrationally or rationally for animals and to assess the prevalence of most prescribed antibiotics in Narayanganj Sadar under Narayanganj district in Bangladesh.

MATERIALS AND METHODS

Study design, setting and study population

This is a cross-sectional prospective study conducted in Narayanganj Sadar Upazilla, Narayanganj, Bangladesh, under the Dhaka Division. Over 40 days of data collection were involved. Age, species, class of veterinary practitioner, and disease pattern were taken into account in this study. Additionally, a patient who has been prescribed one or more antibiotics at any stage during the study period and is between the ages of fewer than 2 and over 7 years is referred to as an "antibiotic patient" ((BBS), 2013).

Data collection

A self-designed standard questionnaire was used to perform this cross-sectional survey, which involved directly interviewing 60 farmers or animal caretakers from the Narayanganj Sadar Upazilla Veterinary Hospital, various organized farms. After gathering information from farmers and animal caretakers, a random sample of consumers who went to pharmacies to buy prescription drugs was recorded.

Statistical analysis

The collected data were first transferred to Microsoft Excel and compiled to facilitate the needed tabulation. Utilizing Microsoft Excel, descriptive statistics were applied to the acquired data to fulfill objectives of the study. Results are represented as percentages.

RESULTS AND DISCUSSION

A total of 60 animals were chosen at random for the interview in this study. Of them, it was discovered that 23 animals (38.3%) had antibiotic prescriptions. According to the breakdown of ages, animals under 2 years were regarded as young where 7 animals (11.66%) were prescribed antibiotics among total animals under survey (60) (Fig.1). In age between 2-5 years animals, mentioned as adult animal, 11 animals (18.33%) were prescribed antibiotics which were the most frequent among them (Fig.1).

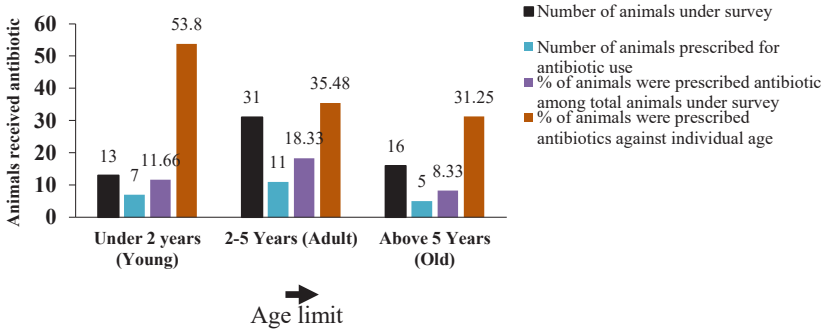

Fig. 1. Status of antibiotic user by age

On the other hand, 7 animals (53.8%) out of the 13 animals (under 2 years) who had their individual ages broken down had prescriptions for antibiotics, the highest percentage indicated in Fig. 1.
Due to our extensive coverage of dairy farms in various regions, of 60 animals 23 received antibiotic prescriptions, 20 out of 23 (87%) were cattle, and 3 out of 23 (13%) were goats as shown in Fig. 2.

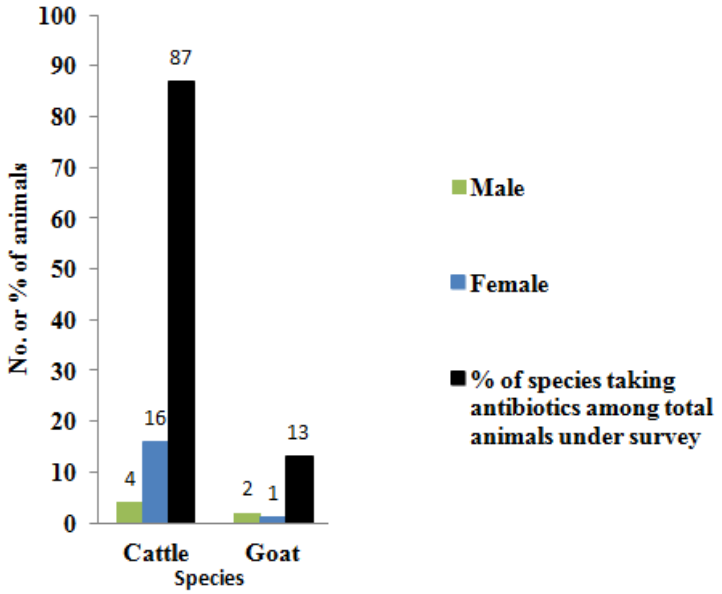

Fig. 2. Species & gender variability for antibiotic use

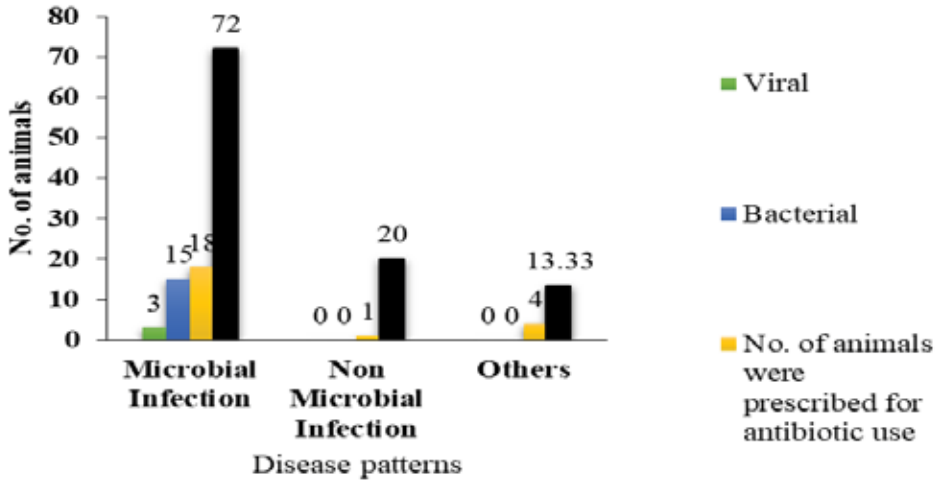

Fig. 3. Disease patterns for antibiotic use

In this analysis, the rate of antibiotic prescriptions to animals that was more susceptible to illnesses was found to be considerable. Although the doctors were irrationally recommending antibiotics, guidelines advise against prescribing them unless an infection has been identified. In this survey, no clinical testing was included in the prescriptions to identify positive microbiological infections. According to this study, the majority of antibiotics were used to treat microbial infections in 18 out of 25 animals (72%), where 3 cases out of 7 viral cases (42.8%) and 15 cases out of 18 bacterial cases (83.3%),

respectively, involved viral and bacterial infections. In situations of non-microbial infection, only 1 animal out of 5 (4.3%) received an antibiotic prescription, and in others cases, 4 out of 30 animals (13.33%) received antibiotics. These cases are demonstrated in Fig. 3. Additionally, in accordance with the established standards, antibiotics could not be the main mode of treatment for the majority of microbial and non-microbial conditions.

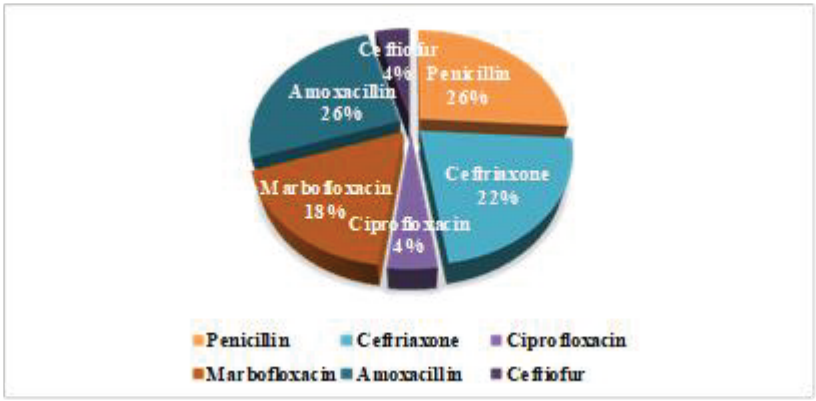

Fig. 4. Antibiotics frequently prescribed for patients

Based on our research, it was found that penicillin and amoxicillin together covered a staggering 26% of all antibiotic prescriptions (Fig. 4). The most common quinolone prescribed was marbofloxacin, which was high compared to other quinolones like ciprofloxacin, which was prescribed at a rate of roughly 4%. About 22% of ceftriaxone prescriptions were for the treatment of mastitis and other infections. This might result in increased cefixime and ceftriaxone resistance. Mastitis was the issue most closely associated with an antibiotic prescription (Biswas *et al.*, 2014). Excluding the registered veterinarians (30.4%), veterinary assistants (13%) and village doctors/quacks (39.1%), who are not authorized to provide antibiotics, have been observed oddly going against the recommended dosage for antibiotics. This is most likely the outcome of contested pharmaceutical firms' marketing strategies in Bangladeshi targeting country veterinary Para-professionals and quack veterinarians, along with a lack of awareness of the most recent treatment recommendations. In addition, antibiotics are frequently and illogically supplied to patients in order to provide them with temporary relief without taking into account the patient's illness condition or potential long-term complications. This occurs as a result of antibiotics being the

Table 1. Status of indiscriminate use of antibiotics based on different parameters

Parameters		Number	Percentages
Professional status of antibiotic prescribers	Registered Veterinarian	7	30.4
	Veterinary Paraprofessionals	3	13
	Quack	9	39.1
	Self	4	17.4
Status of the owner's concern about completion of course of antibiotic	Strongly agree	11	47.8
	Agree	9	39.1
	Disagree	3	13
Owners' perception to stop giving antibiotic	When get improved	4	17.4
	After giving all the doses as prescription	19	82.6
Conclusion of leftover antibiotics used by owners	Keep for further use	4	17.4
	Throw in garbage	19	82.6
Status of record keeping of antibiotics by owners	Never	12	52.2
	Sometimes	11	47.8

drug that prescribers and farmers by themselves use and abuse the most (17.4%) (Table 1). This type of unintentional prescription trend for antibiotics could hasten antibiotic usage and strengthen resistance (Kunin, 1990; Zara, 1991). Worldwide antibiotic abuse is also a result of
improper veterinary hospital practices (Stein, 1984; Aswapokee, 1990; Yang, 1993).
Unfortunately, 13% (3) of the owner disagreed with finishing the antibiotic course. Of all the prescribed (23) farmers, 39.1% (9) of the owners were concerned about the completion of the antibiotic course, the effects of antibiotics, and they agreed with it, with 47.8% strongly agreeing (Table 1). The farmers are particularly concerned about the welfare of their animals and successfully adhere to the regulations regarding the end of the antibiotic treatment.
According to this survey, among 23 prescribed animal's owners, 4 owners (17.4%) thought to stop giving antibiotics after animals became well and 19 owners (82.6%) thought to discontinue giving antibiotics after giving all the recommended doses, as indicated in Table 1.
Approximately 17.4% owners among the prescribed owners, thought to keep the leftover antibiotics for future uses that could lead to improper use of antibiotics in animals, 19 owners (82.4%) discarded the unused medicines in the trash, among 23 prescribed animals owners, as shown in Table 1.
Twenty three (23) prescribed farmers in total, 12 owners (52.2%) of whom never kept antibiotic records, consequently they are unable to establish the history of previous infections and 11 owners (47.8%) of whom sometimes did so (Table 1).
Around 31.7% of farmers were concerned about antibiotic resistance, while 68.3% were not which is alarming (Fig. 5). Again, about 36.7% of farmers were concerned that using all of their prescribed antibiotics could result in antibiotic resistance, while 63.3% were unconcerned. Additionally, 65% of farmers were unaware of it, and roughly 35% of farmers were concerned that an overdose or low dose course could result in antibiotic resistance. 42 farmers (70%) were unconcerned with the antibiotic residue, compared to 18 farmers (30%) who were. Again, around 22 farmers (36.7%) followed the antibiotic withdrawal time, while 38 farmers (63.3%) did not. (Fig. 10). This ignorance contributes to antibiotic resistance, which could pose a future hazard to animal health (Olofsson, 2007).

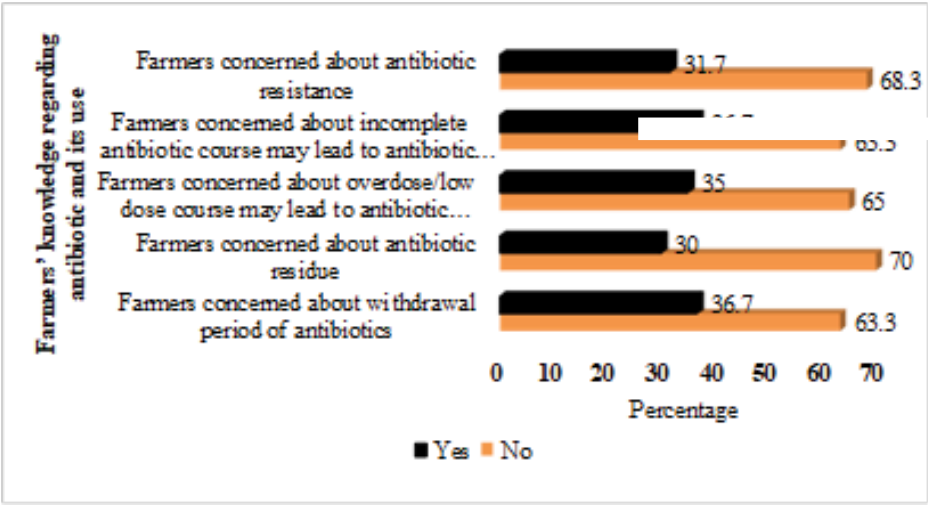

Fig. 5. Status of farmers' knowledge regarding antibiotic and its use

CONCULSION

Conclusively, veterinary practitioners use presumptive diagnosis and empirical treatment to treat animals with antibiotics due to insufficient microbial diagnostic facilities. Thorough training is

beneficial in educating farmers, feed dealers, and drug sellers about standard biosecurity procedures, proper personal hygiene, good farming practices, and the responsible use of antibiotics. The Bangladeshi government must immediately create and put into effect the necessary regulations to reduce the excessive use of antibiotics in food animals by utilizing a multi-sectoral One Health strategy.

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