

Antimicrobial Prescription Practices in the Veterinary Clinics of Addis Ababa, Ethiopia

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Abstract

The objectives of this study were to assess the adherence of animal health workers to rational antimicrobial prescription guidelines. Data were collected from personnel working in 25 clinics by using structured questionnaires. The data included the methods of diagnosis and drug selection, the frequently prescribed antimicrobials, methods of prescription and the availability of drug information sources. The study showed that diagnosis was established on a presumptive basis; pen-strep and oxytetracycline were the frequently prescribed drugs and verbal instruction was a common form of prescription. Adherence to the rational guidelines was substantially low and the prescription practices favor the selection of drug resistant pathogens. Educational programs are needed to ensure the perceived benefit of animals and reduce the rates of emergence of drug resistant pathogens of animal origin in Ethiopia.

Keywords: Addis Ababa, Animals, Antimicrobials, Health workers, Prescriptions

Introduction

The irrational use of drugs is a major problem in present day clinical practices as it could result in toxicities and treatment failures in patients and in the emergence of drug resistant pathogens (Bisht *et al.*, 2009). Whilst drug resistant bacteria were traditionally acquired in hospitals due to high antimicrobial use and disease transmission rate, community acquired drug resistant bacteria are becoming increasingly common (Nelson *et al.* 2009). Resistance may escalate to the point at which the efficacy of drugs will no more be predictable and infections once treatable could become untreatable (Morley *et al.*, 2005).

The occurrence of drug resistant bacteria in animals and animal products (Demelash Biffa *et al.*, 2003; Bayleyegne Molla *et al.*, 2006; Wassie Molla *et al.*, 2006; Endrias Zewdu and Cornelius, 2009; Behailu Bekele and Mogessie Ashenafi, 2007; Zelalem Addis *et al.*, 2011) and humans were reported (Mulugeta Kibret and Bayeh Abera, 2010, Dagneu *et al.*, 2013). Although the relationship between antimicrobial use and antimicrobial resistance is complex, increased levels of antimicrobial resistance is thought to be positively associated with higher levels of antimicrobial usage (Bronzwaer *et al.*, 2002). The irrational use of antimicrobials in farm animals also fosters the emergence of antimicrobial resistant micro organisms (Aarestrup *et al.*, 2001).

Non adherences of health professionals to rational drug prescribing and dispensing guidelines were recorded (Legese Chelkeba, 2013; Abebe Zeleke *et al.* 2014). However, reports on the appropriateness of the prescribing and dispensing behaviors of animal health workers are limited. The objectives of this study were to assess the adherence of animal health workers to rational antimicrobial prescription guidelines.

Materials and methods

The study was conducted in Addis Ababa from November 2009 to April 2010. A total of 52 veterinary clinics (8 public and 44 private) that provided services to an estimated animal population of 66,766 cattle, 28,486 small ruminants, 7,774 equines, 360,684 pets and 360,777 poultry (AACUAD, 2005) were considered. Twenty five clinics (8 public and 17 private) were selected on the based on their accessibility, functional status and willingness of the personnel to participate in the study. Data on the methods of diagnosis and drug selection, the frequently prescribed drugs and prescription methods, availability of information sources and encountered treatment failures were collected by using a structured questionnaire. Descriptive statistics were used to describe the data.

Results

Fifteen (15/25) health personnel had a degree in Veterinary Medicine and 10 a diploma. The median duration of experience was 10 years (range = 4 to 22 years). Fifteen of the 17 private clinics were run by the owners themselves. Clinical signs, history and epidemiology were the main methods used to establish a diagnosis (25/25) and laboratory methods were reported by three re-

spondents. Availability was the first factor considered in drug selection (Table 1) and pen-strep was the most frequently prescribed antibacterial (Table 2).

Table 1. Frequencies of respondents (n= 25) on factors considered in drug selection.

Factors	Frequencies of respondents		
	1 st rank	2 nd rank	3 rd rank
Efficacy	1	16	6
Safety	0	2	8
Cost	0	6	10
Availability	24	0	1

Table 2. Frequencies of respondents (n= 25) on the availability and ranks of the frequently prescribed drugs.

Antimicrobials	Availability	Prescription rank		
		1 st	2 nd	3 rd
Penicillin G	22	0	0	22
Pen- strep	25	22	3	0
Aminoglycosides	5	0	0	0
Oxytetracycline	25	3	18	0

The importance of, combination therapy, use of narrow spectrum agents before broad spectrum agents, use of antibacterial agents for prophylactic purposes and use of older drugs than newer agents were considered by 0/25, 2/25, 10/25 and 12/25 of the respondents respectively. Verbal prescription was a common form of prescription (Table 3) by both diploma (7/10) and degree holders (10/15).

Table 3. Frequencies of respondents (n= 25) on drug prescription methods

Ownership	Number	Verbal	Prescription methods	
			Written	Verbal/Written
Private	17	12	1	4
Public	8	5	3	0
Total	25	17	4	4

Treatment failures were reported by 10 respondents. Essential drug lists and standard treatment guidelines were available in 16 and 18 of the clinics respectively.

Discussion

The study demonstrated that most health workers did not adhere to the rational antimicrobial prescription guidelines. The diagnosis of a disease was generally presumptive; drug sensitivity tests were not carried out and the selection of drugs was primarily based on their availability rather than their efficacy. In addition, a few antimicrobials were commonly prescribed and factors that could help reduce the rates of emergence of resistant pathogens were not considered by most respondents. Moreover, verbal prescription was the major form of prescription and the prescription papers used in some clinics did not contain all the relevant information. In general the prescription practices are suggestive evidences of the reported treatments failures and potentially contribute to the occurrence of resistant pathogens. In a study on the antimicrobial resistance features of salmonella isolates of dairy cattle in Addis Ababa, almost all isolates (20/21) were multi drug resistant (Zelalem Addis, 2011).

Although published studies on the drug prescription behaviors of animal health workers in Ethiopia is not available, non-adherence to rational antimicrobial prescription guidelines were recorded in several hospitals in Ethiopia (Legese Chelkeba, 2013; Abebe Zeleke *et al.*, 2014). The penicillins were the most frequently prescribed drugs (Antenh Assefa Desalegn, 2013; Endale Getachew *et al.*, 201). Inappropriate selection of drugs, over prescription of drugs and inappropriate treatment duration were recorded in several private and public health facilities (Bayew Tsega and Eyasu Makonnen, 2012).

Essential drug lists and standard treatment guidelines were available in more than half of the clinics. However the responses of the interviewees depict that the information sources were not properly used. Guidelines could only be useful if professionals know their importance and are committed to their application. Studies elsewhere show that educational programs are more effective than guidelines alone (Laing *et al.*, 2001) and were reported to have improved the diagnostic qualities of health workers and reduced unjustified prescriptions (Chuc *et al.*, 2002).

Cognizant of the similarities of the facilities, personnel qualifications and drug availabilities all over the country, the results could be extrapolated to other clinical settings in Ethiopia. The overall prescribing practices require attention, and animal health workers should be updated in order to ensure the perceived benefit of the animals and reduce the risk to public health.

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