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Evaluation of Rational Use of Veterinary Drugs in Mudug Region, Somalia

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Abstract: A survey was conducted to evaluate rational use of veterinary drugs in selected districts of Mudug region. A semi-structured questionnaire was disseminated to three randomly selected districts of Mudug region, Central Somalia. The study focused nomadic pastoral communities of these areas and the hypothesized queries focused type of drugs they use, the source, treatment performing personnel, withdrawal period care, availability of community animal health workers to administer drugs in the area, dose calculation and main obstacles related to veterinary drug availability and usage. Results showed remarkable variation of the three districts in all the questions that are proposed for the participants of the study. 56% of the respondent prefer using modern veterinary drugs rather than ethno-veterinary practices. 70% also buy veterinary drugs from privately owned pharmacies, almost 96% of the participants claimed they themselves administer veterinary drugs. 56% did not give attention to withdrawal period and purchase veterinary drugs only searching intended animal's picture on it. Lack of veterinary drugs (30%), veterinary consultants (16%) and high price of veterinary drugs (10%) where the main hindrances that pastoral communities of Mudug region complained during this study. To sum up this preliminary survey revealed that there is huge irrational use of veterinary drugs in Mudug region which can harm the lives of both animal and human. Wide scale study to safeguard the public from drug residual effects and antimicrobial resistance development is recommended.

Key words: Rational Drug Use · Somalia · Veterinary Drug · Withdrawal Period

INTRODUCTION

Veterinary drugs are used in livestock sector either rationally or irrationally as therapeutic, prophylactic and growth promotion. Rational use of drugs is based on the use of right drug, at right dosage, right cost and right time which is well reflected in the world health organization [1] whereas irrational use of drugs is defined as "too many medicines are prescribed per patient, injections are used where oral formulations would be more appropriate, antimicrobials are prescribed in inadequate doses or duration, antibiotics prescribed for non-bacterial infections, prescriptions do not follow clinical guidelines and self-medicate inappropriately or do not adhere to prescribed treatment [2]. Antimicrobials are used in the clinical practice of human and veterinary medicine throughout the world. Most failures during antimicrobial therapy may occur when the pathogenic microorganism is unknown and combination of two or more drugs administered empirically. To avoid these mistakes, clinically confirmed, effective antimicrobial combinations should be used [3].

Improper use of drugs may cause ineffective treatment, unnecessary wastage of resources and may harm the patient. Irrational use of drugs in veterinary medicine and the need for control of their use becomes even bigger problem when used on food producing animals. Here, there is the possibility that minimal quantities of drugs and their metabolites (residues) which remain in edible tissues or in animal products (meat, milk, eggs, honey) induce certain harmful effects in humans as potential consumers of such food [4]. To prevent this risk it is necessary to use drugs rationally, i.e., to use them only when they are really indicated, in the right way, at the right time, in the right dose and respecting withdrawal period. Additionally, it should regularly control sensitivity to antimicrobial agents and regulate residue of antimicrobial agents commonly used in veterinary practice [3, 5].

Rational approach to therapeutics requires careful evaluation of the health problem in each species of animals and selecting appropriate therapeutic strategies [6, 7]. Selection of treatment requires cost/benefit analysis particularly in food animals. Its efficacy, safety with

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minimal adverse effects and minimal residues in food animals should be also given due attention. Drug choice depends on individual patient and prescription; whenever written it should indicate species of animal, the age, sometimes breed, the dose of the drug in the formulations available locally and the duration of treatment. Advice on nutritional support and nursing care are also very important to ensure rational therapeutics [7]. Overuse of antimicrobials [8] and anthelmintics [9] in veterinary medicine, for both food producing and companion animals, favors the development of antimicrobial and anthelmintic resistance.

Until the late 1980s, the development of veterinary services in Somali areas followed a similar pattern to many other African countries. Colonial governments established modern veterinary infrastructure and facilities for quarantine, food hygiene, research and clinical work. At independence, colonial facilities and systems were inherited by new African governments and in the post-colonial era, veterinary services attracted considerable donor support. However, the world recession in the 1970s and 1980s prompted the emergence of structural adjustment policies and worsening veterinary service delivery by the public sector [10]. No available literature about rational use of veterinary drugs in Somalia and Mudug region in particular and this study is aimed to assess the rational use of veterinary drugs in selected districts of Mudug region Somalia.

MATERIALS AND METHODS

Study Area: This study was conducted in three districts of Mudug region (Figure 1) namely Galkaio, Galdogob and Harfo. All are under the administration of Puntland state of Somalia. The microclimate of the three districts are almost close to each other and the mean annual rainfall is 200-300 mm (8-12 inches) with bimodal pattern, average temperature and altitude of the area are 32.7 degree Celsius and 302 m.a.s.l. respectively [11].

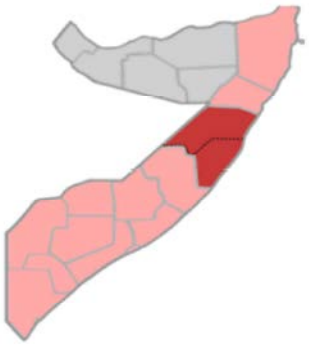

Fig. 1: Deep colored area indicates Mudug region, Somalia

Study Population: The study focused nomadic pastoral communities of Galkaio, Galdogob and Harfo districts of Mudug region. Each visited household, only one person and mainly responsibility bearers like parents were interviewed.

Data Analysis: Data were analyzed by non-parametric methods with Statistical Package for Social Sciences® (SPSS 20.0 version) software. Differences in proportion for each variable between the three districts were determined using descriptive statistics.

RESULTS

Main stream of the respondents (56%) reacted that they accustom modern veterinary medication practice rather than traditional remedies. Galkaio district residents who practice modern veterinary drugs were much higher when compared to Galdogob and Harfo (Table 1). In this study there is also great variation of the drug sources between the districts where almost two out of three respondents (72%) buy veterinary drugs from private pharmacies and stores, only 2% and 6% of the respondents used to buy veterinary drugs from a college open-air veterinary clinics and government veterinary clinics respectively (Table 2). Most of the government veterinary clinic clients were from Galkaio district. Almost (96%) of the respondents administer veterinary drugs themselves without consultation of neither veterinarian nor community animal health worker, the only remaining 4% whom used to consult with veterinarians and CAHWs are from Galkaio district too (Table 3). Furthermore 80% of the respondents replied that they do not know any community animal health workers in their area. None of the respondents from Galdogob knew any CAHWs in that area (Table 4).

Among the pastoral communities questioned those who do not abstain meat and milk of treated animals where relatively higher (66%) from those who apply caution of withdrawal period of the veterinary drugs (34%). In addition to this those who do not care withdrawal period also sell the livestock for meat consumption immediately after the drug administration without attentiveness of the risk of the consumer (Table 5 and 6).

Estimation of doses without proper liaising the amount of drug being given to the animal with its body weight is the main technique used by pastoral representatives (88%) of Mudug region. Nonetheless the remaining respondents (12%) replied that they read the leaflet enclosed within the veterinary drugs to know the exact dosage. The succeeded inquiry was about the way

Table 1: Proportion of modern and traditional remedy users

	Modern veterinary drug users	Traditional remedy users	Both
District			
Galkaio	23(62%)	7(19)	7(19)
Galdogob	4 (50%)	3(38%)	1(12%)
Harfo	1(20%)	1(20%)	3(60%)
Total	28(56%)	11(22%)	11(22%)

Table 2: Drug source in relation with different districts

	Government vet clinics	Private pharmacies	College vet clinic	Not users
District				
Galkaio	2(5%)	28(76%)	1(3%)	6(16%)
Galdogob	0(0%)	5(63%)	0(0%)	3(37)
Harfo	1(20%)	3(60%)	0(0%)	1(20%)
Total	3(6%)	36(72%)	1(2%)	10(20%)

Table 3: Drug administration personnel in the different districts

	CAHWS	Me	Veterinarian
District			
Galkaio	1(3%)	35(94%)	1(3%)
Galdogob	0(0%)	8(100%)	0(0%)
Harfo	0(0%)	5(100%)	0(0%)
Total	1(2%)	48(96%)	1(2%)

CAHWS: Community animal health workers

Table 4: Availability of CAHWs in the different districts

	No	Yes
District		
Galkaio	29(78%)	8(22%)
Galdogob	8(100%)	0(0%)
Harfo	3(60%)	2(40%)
Total	40(80%)	10(20%)

Table 5: Care of withdrawal period

	No	Yes
District		
Galkaio	24(65%)	13(35%)
Galdogob	6(75%)	2(25%)
Harfo	3(60%)	2(40%)
Total	33(66%)	17(34%)

Table 6: Proportion of people who sell their livestock immediately after drug administration

	No	Yes
District		
Galkaio	12(32%)	25(68%)
Galdogob	4(50%)	4(50%)
Harfo	1(20%)	4(80%)
Total	17(34%)	33(66%)

Table 7: The way residents of the different districts measure dose of veterinary drugs`

	By estimation	Reading leaflet
District		
Galkaio	35(95%)	2(5%)
Galdogob	5(62%)	3(38%)
Harfo	4(80%)	1(20%)
Total	44(88%)	6(12%)

Table 8: Distinguishing veterinary drugs

	Asking veterinarian	Identifying animal picture on the drug	Reading the name of the drug
District			
Galkaio	11(30%)	25(67%)	1(3%)
Galdogob	1(13%)	5(62%)	2(25%)
Harfo	2(40%)	2(40%)	1(20%)
Total	14(28%)	32(64%)	4(8%)

Table 9: Proportion of people who fulfill the treatment regimen

	No	Yes
District		
Galkaio	21(57%)	16(43%)
Galdogob	5(62%)	3(38%)
Harfo	4(80%)	1(20%)
Total	30(60%)	20(40%)

Table 10: Obstacles that tackle the use of veterinary drugs in an appropriate way

	All	Luck of veterinary drugs	Luck of veterinary service consultants	Veterinary drugs are expensive
District				
Galkaio	16(43%)	14(38%)	6(16%)	1(3%)
Galdogob	4(50%)	1(13%)	1(12%)	2(25%)
Harfo	2(40%)	0(0%)	1(20%)	2(40%)
Total	22(44%)	15(30%)	8(16%)	5(10%)

they choice veterinary drugs when buying from the veterinary clinics, private pharmacies and stores, remarkably only availability of the intended animal's picture on the drug was the main characteristic that pastoral communities use to purchase veterinary drugs (64%). Treatment regimen varies from different drugs and the proportion of the respondents whom do not complete treatment period was somewhat higher from those who complete it and appeared 60% and 40% respectively (Table 7, 8 and 9).

Lack of veterinary drugs (30%), inaccessibility of veterinarians and CAHWs to consult (16%) and high price of veterinary drugs (10%) where the main hindrances that pastoral communities of Mudug region stressed during this study, Moreover 44% of them complained combination of all the challenges (Table 10).

DISCUSSION

The usefulness of the rational drug use approach in human medicine is well documented, but it has been less widely applied to animal health and this is the first report to evaluate rational use of veterinary drugs in the study area. The respondents were the endpoint of Somalia's veterinary drug supply chain. International standard-setting organizations such as the Office International des Epizooties and Food and Agriculture Organization also recommended that antibiotics should be prescribed by veterinarians only for animals under their direct supervision. Somali pastorals once used to treat their ill animals by traditional remedies but within the last century, veterinary drugs were imported to the country which popularized the use of modern veterinary medicines. Among the respondents almost 56% prefer to use modern veterinary drugs, In agreement to this issue [12] and his team reported that most of the Sanaag pastorals in northern Somalia also preferred modern veterinary drugs than traditional remedies, this could be due to unreliability of traditional remedies, extinction of ethno-veterinary experts in the community, introduction of livestock treatment campaigns and extension of private pharmacies. Because of convenience and easy availability of veterinary drugs in Galkaio district, traditional remedy users was very minimal.

The reason why approximately 72% of the respondents buy from private veterinary pharmacies predominantly owned by non-veterinarians is due to unavailability of public and private veterinary clinics where proper disease diagnosis could be made, [13] also reported that private drug shops were the primary sources of veterinary drugs for 67% of smallholder farmers compared to only 33% from official Government extension agents in Tanzania.. It is not a surprise that nearly all participants (96%) claimed that they do administer veterinary drugs by themselves, this could be due to lack of veterinarians and CAHWs to refer for diagnosis and treatment, since Galkaio district have access of one government veterinary clinic and one veterinary college

clinic, few of the respondents from this district refer veterinarians for drug administration and 80% of the people answer back that they do not know any CAHWs to refer in their communities.

Most of the pastorals (66%) who participated this study were unaware when it comes to withdrawal period cautioning and use meat and milk of treated animals for human consumption and even sell the milk and meat of treated animals for public consumption, other researcher in Ghana and Tanzania found communities do not often care about withdrawal periods in treated animals and animals are usually treated and milked at the same time in the morning before being let out to graze [14, 13, 15]. The possible reasons can be illiteracy to read the leaflet, private veterinary pharmacies do not give advice about the withdrawal period when selling drugs and even economic insecurity of the households to refrain milk for the children and income generation for subsistence livelihood. Estimation of the dose given to the animals is the commonest technique that pastoral communities use without knowing dose weight compatibility. This is because of incompetence to read intended dose for each species written on the leaflet or bottles of the drug, misconception of if the dose increases the degree of treatment success increases claimed by many Somali nomads and even private veterinary pharmacy owners for marketing purposes.

Current study furthermore revealed that availability of intentional animal's picture on the drug was the principal method that pastorals (64%) used to choice drugs for their livestock and distinguish different veterinary drugs in the market. One possible reason could be that private veterinary pharmacists point out animals for the pastorals for advertisement, increasing the confidence of the people whenever they see affected animal or organ's picture on the drug and even lack of veterinarians to consult contributed this widespread misunderstanding. In addition large proportion of the participants do not complete the treatment schedule required, this is furthermore due to illiteracy to read the dose and being unaware acting period of some drugs is very short while others it could be long.

Together lack of efficient veterinary drug supply systems in the remote areas of Mudug region, absence of price fixation of veterinary drugs of the government and unavailability of animal health experts to consult, all contributed poor utilization of veterinary drugs, irrational use of these drugs and even public health risks.

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