Pharmacy Education, 2017; 17 (1) 24 - 28

Stocking and dispensing of veterinary medicines by pharmacists in Ghana

ANTHONY AMALBA[1], BABA SULEMANA MOHAMMED[2], EVANS PAUL KWAME AMEADE[2*], ERIC WOODE[3]

[1]*Department of Health Profession Education and Innovative Learning, School of Medicine and Health Sciences, University for Development Studies, Tamale, Ghana*

[2]*Department of Pharmacology, School of Medicine and Health Sciences, University for Development Studies, Tamale, Ghana*

[3]*Department of Pharmacology, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana*

Abstract

Introduction: Good animal healthcare systems require the use of quality veterinary pharmaceuticals handled by knowledgeable and qualified personnel. This study assessed the level of involvement of Ghanaian pharmacists in the stocking and dispensing of veterinary pharmaceuticals.

Method: This cross-sectional descriptive study was conducted through the use of a semi-structured questionnaire administered to pharmacists at their Annual General Meetings in Kumasi, Ghana between 12th and 18th August, 2013. Data were analysed using Statistical Package for the Social Sciences, version 18 (SPSS© Inc, IBM, Chicago, IL, USA) and GraphPad 5.01 (GraphPad Software Inc.©, San Diego CA). Association between different variables was tested.

Results: Of the 200 questionnaires administered, 69 were completed which showed a response rate of 34.5%. There was limited involvement of pharmacists (7.2%) in the stocking and dispensing of veterinary pharmaceuticals in Ghana, although the majority (72.5%) considered it necessary for pharmacies to stock such products. Pharmacists considered lack of knowledge as the greatest factor limiting their role in the handling of animal drugs in their pharmacies.

Conclusion: Stocking and dispensing of veterinary pharmaceuticals in Ghanaian pharmacies is limited. The pharmacists in this survey suggested lack of adequate knowledge on veterinary pharmacy was hindering their ability to provide healthcare services to animals in their pharmacies. There is therefore the need for the Pharmacy Council of Ghana and the pharmacy training institutions in Ghana to include veterinary pharmacy in their curriculum and provide opportunities for practicing pharmacists to upgrade their knowledge.

Keywords: *Veterinary Pharmacy, Pharmacists, Veterinary Pharmaceuticals, Ghana*

Introduction

The demand for livestock products across the world and especially in Africa has seen an increase as a result of high population growth, urbanisation and increasing income levels. Preventable livestock diseases that has afflicted several African countries has led to huge loss of livestock which has had dire consequence on the livelihood of farmers and the economies of such countries (Maddox, 2006). According to Perry & Grace, (2013) a Rift Valley fever pandemic cost Kenya US$ 32 million while Botswana lost US$ 300 million during an outbreak of contagious bovine pleuropneumonia. With a cattle and buffalo population of 280 million, livestock contributes about US$ 14 billion to the economy of Africa which is known to constitute 30 to 50% of total agricultural GDP in several sub-Saharan African countries (Hassane, 2013). An outbreak of any preventable disease would therefore be disastrous for the economies of African countries. It is therefore imperative that African countries put in place reliable and efficient animal healthcare systems.

The veterinary pharmaceutical industry has a critical role to play in improving the quality of Africa's animal healthcare. Drug is defined by law in Ghana as:

> "*...a substance or mixture of substances prepared, sold or represented for use in the diagnosis, treatment, mitigation or prevention of disease, disorder or abnormal physical state, or the symptoms of it, in human or animal or restoring, correcting or modifying organic function in human or animal.*" (Food and Drugs Act, 1992)

In Ghana, no person is allowed to mix, compound, prepare or supply restricted drugs unless that person is a pharmacist or a licensed company (Pharmacy Act, 1994). It is therefore expected that in Ghana, only pharmacies will stock and dispense veterinary medicines.

*Correspondence: Evans Paul Kwame Ameade, *Department of Pharmacology, School of Medicine and Health Sciences, University for Development Studies, P.O.Box TL 1350, Tamale, Ghana. Tel: +233 243 261144. Email: sokpesh@yahoo.com*

ISSN 1447-2701 online © 2017 FIP

This study undertaken among pharmacists assessed whether they stock and dispense veterinary pharmaceuticals as mandated by the laws of Ghana.

Methods

Study design and setting

The research was descriptive and cross-sectional in nature which involved the use of a self-administered questionnaire designed to collect information on respondents' demography as well as issues related to the stocking and dispensing of veterinary pharmaceuticals in their pharmacies. The de novo semi-structured questionnaire was pre-tested on 20 pharmacists, which ensured correction of ambiguous and inconsistent questions before it was administered for the actual data collection. The authors reviewed the questionnaire to ensure face validity of the data collecting tool.

The final questionnaire was administered to pharmacists from all parts of Ghana during the Annual General Meeting of the Pharmaceutical Society of Ghana in Kumasi from the 12th -18th August, 2013.

Statistical Analysis

All data collected were analysed using the Statistical Package for the Social Sciences (SPSS©) version 18 (Illinois, USA) and GraphPad prism version 5.01 (GraphPad Software Inc.©, San Diego CA). Results were presented as frequencies and percentages. Association between pharmacists' socio-demographic variables and their desire to stock and dispense veterinary pharmaceuticals was assessed using the *t*-test. Statistical significance was set at $p<0.05$ and at a confidence interval of 95%.

Results

Out of two hundred questionnaires administered, 69 were reasonably completed and used in the study giving a response rate of 34.5%. The majority of pharmacists who participated in the study were males (65.2%). Twenty-five (36.2%) were in the age range of 21 to 30 with only nine (13.0%) older than 50 years. Most respondents, 79.1 % held a first degree of Bachelor of Pharmacy at the time of the study, with up to 87.0% obtaining the degree from Kwame Nkrumah University of Science and Technology. A greater proportion (59.4%) of respondents had practiced pharmacy for less than ten years with the majority of respondents (72.5%) practicing pharmacy in the urban areas of Ghana. Table I shows the socio-demographic characteristics of the respondents in this study.

Although the majority of pharmacists (72.5%) suggested that pharmacists should dispense veterinary pharmaceuticals in pharmacies, only 7.2% of these respondents reported stocking these veterinary pharmaceuticals in their pharmacies. The most common reasons for the low level of stocking and dispensing of veterinary pharmaceuticals reported by the respondents were inadequate knowledge on veterinary pharmaceuticals (45.9%), and limited demand and supply at the pharmacies (31.1%). Majority of respondents, (69.6%) had not yet received a prescription from a veterinarian. For pharmacies who did not stock veterinary pharmaceuticals, majority of them (57.1%) refer clients requiring animal medicines to other pharmacies. The prescriptions received were mostly for dogs (50.0%) or chicken (35.7%) with prescriptions for cattle, cats and turkey being the least common (7.1%). Minority (20.3%) of respondents had received veterinary prescriptions in their pharmacies. In situations where pharmacists had challenges with the handling of the veterinary prescription, they were most likely to refer the client to a veterinary clinic (42.9%). Table II shows the level of stocking of veterinary medicines by the respondents and how they managed veterinary prescriptions.

Table III shows the association between socio-demographic characteristics of respondents and their views on stocking and dispensing of veterinary pharmaceuticals in Ghanaian pharmacies. This study found more male pharmacists than their female colleagues (81.4% vrs 64.7%) as well as greater number

Table I: Demographic characteristics of respondents

Variable	Subgroup	Number	Percentage
Sex	Male	45	65.2
	Female	17	24.6
	Missing	7	10.1
Age range	21 - 30	25	36.2
	31 – 40	21	30.4
	41 – 50	12	17.4
	> 50	9	13.0
	Missing	2	2.9
Highest qualification	BPharm	55	79.7
	MPharm	7	10.1
	MPH	4	5.8
	MPhil	1	1.4
	Missing	2	2.9
Graduating Pharmacy School	KNUST	60	87.0
	UG	1	1.4
	CUC	3	4.3
	Former Soviet Union	1	1.4
	Missing	4	5.8
Period of practice	<10	41	59.4
	> 10	26	37.7
	Missing	2	2.9
Location of facility	Rural	14	20.3
	Urban	50	72.5
	Missing	5	7.2

Table II: Stocking and dispensing of veterinary medicines by pharmacists

Item	Subgroup	Number	Percentage
Should pharmacists dispense veterinary medicines in their pharmacies (n = 69)	Yes	50	72.5
	No	15	21.7
Do you stock veterinary medicines in your pharmacy? (n = 69)	Yes	5	7.2
	No	61	88.4
Reasons for not stocking and dispensing of veterinary medicine (n = 61)	Small profit margin	3	4.9
	Inadequate knowledge	28	45.9
	Limited demand and supply	19	31.1
Do you receive prescriptions from veterinarians (n = 69)	Yes	14	20.3
	No	48	69.6
What do you do when you do not have prescribed veterinary medicine? (n =14)	Refer to veterinary clinic	4	28.6
	Refer to another pharmacy	8	57.1
When faced with a challenge in relation to dispensing of veterinary medicine, who is consulted (n = 14)	Another pharmacist	4	28.6
	Veterinary surgeon	3	21.4
	Refer to a veterinary clinic	6	42.9
Which farm or domestic quadruped's prescriptions do you receive? (n = 14)	Cats	1	7.1
	Dogs	7	50.0
	Cattle	1	7.1
	Several animals	3	21.4
Which birds to you often receive prescriptions for? (n = 14)	None	5	35.7
	Fowls	5	35.7
	Turkeys	1	7.1

Note: The total percentages are not equal to 100 due to missing values. The percentages are based on the number of respondents (n) including those who missed some questions

Table III: Relationship between socio-demographic characteristics of respondents and their views on whether pharmacies should stock and dispense veterinary medicines

Variable	Subgroup	Yes	No	Percentage agreeing that pharmacies should stock veterinary medicines	*p*-value
Sex	Male (n=43)	35	8	81.4	0.1900
	Female (n=17)	11	6	64.7	
Age (years)	21-30 (n=24)	16	8	66.7	
	31 – 40 (n=21)	18	3	85.7	
	41 - 50 (n=12)	9	3	75.0	
	>50 (n=8)	7	1	87.5	0.4128
Location of pharmacy	Rural (n=14)	10	4	71.4	0.4660
	Urban (n=48)	39	9	81.3	
Number of year of practice	< 10 years (n=40)	29	11	72.5	0.3710
	>10 years (n=25)	21	4	84.0	

Note: The total number of respondents are not equal to 69 due to missing values

of pharmacists practicing in urban areas of Ghana than those in the rural settings (81.3% vrs 71.4%), supported the suggestion that pharmacies should stock and dispense veterinary pharmaceuticals. Again, pharmacists older than 50 years and those who had practiced for more than ten years were more desirous of handling veterinary pharmaceuticals than their younger colleagues (87.5% vrs 66.7% to 85.7%) or those who had practiced pharmacy for less than ten years (84.0% vrs 72.5%). There was however no association between respondents' view on the stocking and dispensing of veterinary pharmaceuticals in Ghanaian pharmacies and their sex, location of practice, age and number of years of practice.

Discussion

Products of livestock serve as an important source of protein for the sustenance of human life. Pharmaceuticals are used for the management of diseases of livestock and to maintain their development. Inappropriate use of these pharmaceuticals in animals can ultimately have adverse effect on the final consumer of their products, the human being. Pharmacists are experts in the handling of human drugs and since these same drugs are used in other animals, they can serve the health needs of animals well if well trained in veterinary medicines. This study found a low level of stocking of veterinary pharmaceuticals by pharmacists (7.2%) in Ghana, and the same has been recorded in Tanzania where the majority of pharmacists play a very limited role in the dispensing of veterinary pharmaceutical products (Justin-Temu *et al.*, 2009). Though low numbers of pharmacists in Ghana stock these type of drugs, the majority (72.5%) were desirous of dispensing veterinary pharmaceuticals. For 57.1% of the pharmacists to advise clients to check other pharmacies to get their prescriptions when they do not stock them showed that Ghanaian pharmacists are reasonably aware that pharmacies are the most appropriate facility to dispense veterinary pharmaceuticals. For about two-thirds of the pharmacists to refer challenges with veterinary prescriptions back to the veterinary surgeon or the veterinary clinic showed how handicapped they were in relation to advising on veterinary pharmaceuticals and confirms the assertion that the majority of pharmacists lacked knowledge on medicines for animals. In Zimbabwe however, 75% of pharmacists stocked some veterinary pharmaceutical products in their pharmacies although 83% said they have poor knowledge in relation to veterinary pharmaceuticals (Matema *et al.*, 2005). So the lack of knowledge cannot be the only reason for the lack of stocking and dispensing of veterinary pharmaceuticals in Ghana. Respondents in this study stated small profit and limited demand of veterinary pharmaceuticals as other reasons for not stocking them but Grasswitz *et al*. (2004) indicated that dealing in veterinary pharmaceutical is a profitable business and could be another source of income for the pharmacist. This study, showed that only a fifth of pharmacist in this study had ever receive a veterinarian prescription which means Ghanaian animal owners are getting their veterinary pharmaceuticals from sources outside the pharmacy which is the only legal

source for the stocking and dispensing of such animal medications in Ghana. This situation is not only peculiar to developing countries since a study in the Great Britain in 2004 showed that the pharmacists there also had little involvement in the supply of veterinary medicines (Monie, *et al.*, 2006). Designing and formulation of veterinary pharmaceuticals requires considerations different from that of humans since there are pharmacokinetic and pharmacodynamic differences between humans and other animals (Moghimi, 2010). This means pharmacists who had limited knowledge on veterinary pharmaceuticals cannot extrapolate the human medicines' dosages and indications to animals. Although the pharmacists in this study admitted possessing poor knowledge on veterinary pharmaceuticals, their services should be better than personnel who currently retail veterinary pharmaceuticals in most developing countries. A study in Kenya showed that most retailers of veterinary pharmaceuticals were holders of a secondary school certificate (Bett *et al.*, 2004). To enable Ghanaian trained pharmacists to play better roles in the management of veterinary pharmaceuticals, the Pharmacy Council, the pharmacy profession regulatory body in Ghana, should get all the pharmacy training institutions to introduce veterinary pharmacy course in their curriculum and should upgrade the knowledge of practicing pharmacists through the annual Continuous Professional Development programme. The Pharmaceutical Society of Ghana should also include topics on veterinary pharmaceuticals in their scientific sessions during their annual general meetings.

The low response rate recorded in this study presents a limitation worth noting hence the results may not reflect the attitude of Ghanaian pharmacists towards veterinary pharmaceuticals. Further surveys with a greater number of pharmacists on this topic would have to be conducted in the future. Another limitation that could affect the results obtained from this study was the use of self-administered questionnaire rather than interviewing, which made verification of the answers provided by the respondents difficult.

Conclusion

Most Ghanaian pharmacists are not involved in the stocking and dispensing of veterinary pharmaceuticals with inadequate knowledge on veterinary pharmacy being the main reason for their limited involvement. Neither age, sex, number of years of practice nor location of practice had any association with the respondents' views on the stocking and dispensing of veterinary pharmaceuticals in Ghanaian pharmacies.

Conflict of Interest

Authors have no conflict of interests

Source of Funds

The work was not supported or funded by any person or organisation but was financed by the authors

Acknowledgement

Authors wish to acknowledge the role of Mr Victor Mogre of the Education Unit of the School of Medicine and Health Sciences of the University for Development Studies who read through the questionnaire and made valuable intellectual input.

References

Bett, B., Machila, N., Gathura, P.B., McDermott, J.J. & Eisler, M.C. (2004). Characterisation of shops selling veterinary medicines in a tsetse-infested area of Kenya. *Preventive Veterinary Medicine*, **63**(1-2), 29 – 38.

Food and Drugs Act. (1992). Food and Drugs Act, Ghana, Ch. 51, Accra: Assembly Press.

Grasswitz, T.R., Leyland, T.J., Musiime, J.T., Owens S.J. & Sones, K.R. (eds). (2004). The veterinary pharmaceutical industry in Africa: a study of Kenya, Uganda and South Africa. African Union/ Interafrican Bureau for Animal Resources (AU/IBAR), Nairobi, Kenya.

Hassane, H.M. (2013). The promotion of the Livestock Industry for food security in Africa and Arab countries (online). Available at: http://www.badea.org/Portal/Document_Repository/229/2_The%20Promotion%20of%20the%20Livestock%20Industry%20for%20Food%20Security%20in%20Africa%20and%20Arab%20countries-Hassane%20Mahamat.pdf. Accessed on 13th January, 2017.

Justin-Temu, M., Mwambete, K.D. & Willard, T.E. (2009). The role of the pharmacist in Animal Health care: Case study IlalaDistrick, *Dar es Salaam. East and Central African journal of Pharmaceutical Sciences*, **12**, 34-36.

Maddox, G. (2006). Sub-Saharan Africa: an environmental history. ABC-CLIO (online). Available at: https://books.google.com.gh/books?hl=en&lr=&id=JFSSMeNTAVkC&oi=fnd&pg=PR7&dq=Maddox,+G.+2006+Sub-Saharan+Africa:+an+environmental+history.+Santa+Barbara,+CA:+ABC-Clio&ots=60DYw0OpMC&sig=nwTt98Ec4HB5nof-W6-FExVZVM8&redir_esc=y#v=onepage&q&f=false. Accessed on 13th January, 2017.

Matema, S., Gavaza, P. & Maponga, C.C. (2005). Pilot Study of the Role of Pharmacists in the Use of Veterinary Pharmaceutical Products in Harare and Chitungwiza, Zimbabwe. *East and Central African Journal of Pharmaceutical Sciences*, **8**(3), 50-53.

Moghimi, H.R. (2010). Veterinary Pharmacy, a Dismissed Necessity. *Iranian Journal of Pharmaceutical Research*, 227-229.

Monie, O.R., Byrant, C.E. & Skelly, B.J. (2006). Survey of pharmacists' awareness of veterinary medicines. Veterinary Record. doi:10.1136/vr.158.7.223

Perry, B. & Grace, D. (2009). The impacts of livestock diseases and their control on growth and development processes that are pro-poor. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, **364**(1530), 2643-2655.

Pharmacy Act. (1994). Pharmacy Act, Ghana 489: Ch. 36, Accra: Assembly Press.