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Evaluation of the Practice of Veterinary Pharmacy

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Running Title: Veterinary Pharmacy Practice in the UK

Abstract

Background

In the United Kingdom (UK) pharmacists roles have expanded considerably in recent decades to encompass clinical practice through

more direct patient care. However, dispensing and compounding remain core activities for pharmacists. Lack of marketed preparations for species specific animal use results in compounding retaining its prominence in veterinary pharmacy practice. Current participation by pharmacists to support this sphere of practice would appear to be minimal.

Objectives

The study was undertaken to obtain the views and opinions of pharmacists working in a variety of settings on the practice of veterinary pharmacy.

Methods

Research data were collected via a self-administered survey questionnaire, distributed at the 2012 annual conference of the Royal Pharmaceutical Society. Sampling was purposive, with random distribution of the questionnaire to pharmacists during the conference sessions.

Key Findings

Interaction by pharmacists with veterinary pharmacy is currently minimal primarily due to lack of knowledge of veterinary medicines. Respondents revealed a lack of tuition of veterinary pharmacy during their undergraduate studies. This has led to situations where some veterinary prescriptions are dispensed without adequate checks being performed by the pharmacist. Pharmacists' on occasion do not dispense veterinary prescriptions presented to them, due to insufficient knowledge of veterinary medicines and/or a lack of consultable reference sources.

Translated into practice, pharmacists do not participate as fully with veterinary pharmacy as could be expected.

Conclusions

Pharmacist participation with veterinary pharmacy is limited by a lack of knowledge of veterinary medicines mostly resulting from inadequate tuition on veterinary pharmacy during their initial education.

Keywords

Veterinary pharmacy, veterinary medicines, pharmacy education, pharmacists continuing professional development (CPD)

Introduction

Pharmacists are medicine experts most frequently employing their professional knowledge in community (primary) or hospital (secondary) healthcare settings.[1,2] In recent decades the pharmacist's role has expanded to encompass clinical practice through patient care (via medicine monitoring), prescribing and medicine usage reviews.[1-3] Importantly compounding, the manipulation of a drug product resulting in a bespoke drug dosage form, and dispensing remain core activities of pharmacists'.[1,4-6]

Historically, due to the lack of marketed preparations available for animal use, compounding was also a core skill of veterinary surgeons.[5] However availability of commercially prepared veterinary medicines has expanded rapidly over recent years making possession of such skills less critical. This is illustrated by the extensive portfolio of veterinary drugs marketed by Novartis Animal Health (NAH) (acquired by Elanco January 2015),

Zoetis (a Pfizer subsidiary) and Merck Sharp and Dohme (Merck Animal Health in United States (US)) three of the largest pharmaceutical companies servicing this important healthcare sector.[7-9] Veterinary products sold globally by NAH, Zoetis and Merck in 2012 included those for companion animals, livestock including pig, poultry, cattle and sheep as well as medicines for other animal classes including equine and piscine species. Product applications ranged from parasiticides for companion animals to antimicrobial agents for food animals. The total global sales value of these veterinary products in 2012 was $1.1 billion for NAH, $4.2 billion for Zoetis and $3.3 billion for Merck Animal Health.[7-10] Given the financial returns from this expanding sector, most pharmaceutical companies have on-going research and development programmes for new products as these companies recognise the substantial commercial benefits that will accrue.[7-9] Limited UK pharmacist involvement in veterinary pharmacy is indicated by the supply in 2009 of 75% of prescription only medicine – Veterinarian (POM-V), medicines directly by veterinary surgeons through their clinics.[11] Pharmacists' poor involvement in over-the-counter (OTC) sales of veterinary products such as worming preparations and anti-flea products is illustrated by the share in 2009 by UK pharmacies of just 1.5% of the total veterinary medicines market.[11]

Veterinary label drugs must be approved by the Food and Drug Administration (FDA) and the Centre for Veterinary Medicine (CVM) (a centre in the FDA) before the legal marketing and distribution of these medicines can occur in the US.[12] Approval by the FDA/CVM also constitutes marketing authorisation for both veterinary and human medicines.[12] A single application for a marketing authorisation may be

made to the European Medicines Agency (EMA) valid for all EU states, Iceland, Liechtenstein and Norway.[13] Obtaining such authorisation is costly; a 2014 FDA application fee for licensing a product containing clinical data in the US alone is approximately $2.2 million, being half this sum for products without clinical data.[14] Current UK application fees for 2014 stand at approximately £100.000.00.[13] Due to this expense, pharmaceutical companies license a product in a specified formulation for use in a particular species in each country or area.[6,15] Therefore, compounding remains routinely required in veterinary practice to permit dose alteration, changes to routes of administration, or off-label use of products for interspecies treatment, permitted under US federal law AMDUCA.[5-6] Such changes are necessary as doses and dosage forms formulated for human medications are not always conducive to the needs of diverse animal patients.[5,6] Alterations to licensed products via compounding are a cause for concern because drug instability or incompatibility issues can result in therapeutic failure or potentially cause harm to the animal patient.[5-6,16] Whilst current veterinary graduates in the UK completing approved degree courses from the Royal College of Veterinary Surgeons (RCVS) can prescribe, dispense, store and dispose of medicines correctly, graduate knowledge of pharmaceutics, drug formulation and compounding is absent.[17] Veterinary curricula in the United States are similarly lacking inclusion of courses such as pharmaceutics.[16] The General Pharmaceutical Council (GPhC), the regulatory body of the pharmaceutical profession in the UK, stipulates one of the requirements of graduate pharmacists to be the ability to apply pharmaceutical principles for the formulation, preparation and packaging

of products.[18] In practical terms this makes pharmacists the ideal professionals to undertake alterations to product vehicles, excipients or dosage forms in order to optimise drug delivery, absorption and efficacy for all patients, including animals.[16] Accredited MPharm degree courses are offered by twenty-nine Schools of Pharmacy in the UK,[19] yet beyond information for safe storage, dispensing and supply of veterinary medicines safely and effectively, no School of Pharmacy MPharm syllabus details specific courses, compulsory or elective on veterinary medicine delivered to pharmacy undergraduates.

Whilst market size and innovation of veterinary medicines and product formulations are increasing, current interaction by pharmacists' in the UK with veterinary pharmacy is minimal.[20] The potential for expansion of the pharmacists role in the practice of veterinary pharmacy that would benefit non-human patients is a viable option.[20-21] A requirement for pharmacist knowledge of veterinary medications may be necessary sooner rather than later should legislation similar to the pending US Fairness to Pet Owners Act, be enacted in the UK.[22] This Act requires prescribers of veterinary medicines in the US to provide pet owners with a copy of a veterinary prescription and a written disclosure permitting dispensing of said prescription in a pharmacy of the pet owner's choosing.[22] Should such legislation to be introduced in the UK, pharmacists could find themselves facing increased numbers of veterinary prescriptions and the need for greater knowledge of veterinary medicines. [22]

Little published data is available regarding the views and opinions of registered pharmacists towards the practice of veterinary pharmacy due to limited research in this area of pharmaceutical practice. However, a

recent investigation with a relatively limited sample population found this low level participation with veterinary pharmacy is largely due to lack of information and knowledge of veterinary medicines.[21] Delivery of minimal information on veterinary pharmacy in the undergraduate pharmacy curriculum was attributed by these pharmacists, as the main cause for their poor participation with this sector of pharmaceutical practice.

Aim of the Study

In order to more broadly determine the opinions and views of pharmacists towards the current practice of veterinary pharmacy in the UK, a research study was undertaken with participants obtained from those attending the annual UK conference of the Royal Pharmaceutical Society (RPS) in 2012. The main aim was to explore the perceptions of a broad section of pharmacists on the topic of veterinary pharmacy. The study also sought to determine the educational background permitting their interaction with veterinary pharmacy and the extent of their current exposure to veterinary medicines. Therefore, to permit cross-sectional perspectives from pharmacists employed in all areas of pharmaceutical practice; those attending the 2012 RPS conference were invited to participate.

Methods

Ethical approval for this work was granted by the School of Pharmacy and Life Sciences Research Ethics Committee of the Robert Gordon University, Aberdeen in 2012 (reference code: PALS/12/6-1). Permission was sought and obtained from the RPS to conduct the survey with delegates attending their annual conference held in the UK in September 2012.

Questionnaire Development

After initial pilot study was completed and evaluated along with minor modifications in early 2012, research data were collected via a self-administered survey questionnaire (available at: http://www2.rgu.ac.uk/pharmacy/quickaccess/Veterinary_Pharmacy_Questionnaire.pdf). The sampling approach was purposive, with random distribution of the questionnaires to 100 pharmacists encountered during the conference sessions.

Study Focus

Information was sought from respondents on veterinary pharmacy covering five main aspects, specifically: their sphere of professional practice; veterinary pharmacy tuition; exposure to veterinary pharmacy; veterinary pharmacy practice; and expanding pharmacy services. Additional relevant comments on the topic were invited through request to provide written statements at the end of the questionnaire. All questionnaires and subsequent files were stored securely after collection and during the data extraction process. Information from the completed questionnaires was manually extracted and independently checked for accuracy before tabulation.

Results

A completion rate of 95% was recorded from the questionnaires distributed through direct approach of the conference registrants.

Sphere of Professional Practice

Respondents were all pharmacists employed in different spheres of practice; community pharmacists (42%), hospital pharmacists (28%),

academic pharmacists (20%), retirees (2%), pharmacists on career break (2%), industrial pharmacist (1%), self-employed consultant (1%), publishing executive (1%), medicine appraisals expert (1%) and a pharmaceutical company executive (1%) (Table 1).

Area of Professional Practice	**Community Pharmacy**	**Hospital Pharmacy**	**Academia**	**Industry**	**Other**	**Total**
	40	27	19	1	8	95
Location of Pharmacy	**City**	**Suburban**	**Rural**	**NPB**		**Total**
	40	22	19	28		109

Table 1: Demographics of questionnaire respondents. NPB – non-practice based pharmacists

Though a substantial number of pharmacists (29%) did not work in pharmacies due to the nature of their employment, a proportion (7%) nonetheless maintained their status as a practising professional through periodic locum work in registered pharmaceutical premises. As attendance at the RPS conference was not limited to pharmacists practicing in the UK, responses of pharmacists (7%) from a number of European Union (EU) member countries were also recorded. Pharmacy locations were urban (37%), suburban (20%) and rural (17%). A proportion of pharmacists were employed in more than one pharmacy, which accounted for the total number of recorded pharmacies as 109.

Veterinary Pharmacy Education

Some pharmacists (36%) received tuition in veterinary pharmacy during their undergraduate studies with a small majority (54%) receiving none. A small proportion (10%) was unable to remember whether information had

been delivered to them or not due to the length of time that had elapsed since graduation (Table 2).

Received under-graduate tuition in veterinary pharmacy	**Yes**	**No**	**Don't remember**	**Total**
	34	51	10	95
Undertook post-graduate tuition in veterinary pharmacy	**Yes**		**No**	**Total**
	4		91	95
Whether tuition in veterinary pharmacy should be included in the under-graduate pharmacy degree course	**Yes**		**No**	**Total**
	91		4	95
Willingness to undertake an on-line or residential course in veterinary pharmacy	**Yes**		**No**	**Total**
	54		41	95
Preferred format delivery for veterinary pharmacy course	**On-line course**		**Weekend residential**	**Combined on-line/ residential**
	28		17	9

Table 2: Perspectives concerning education of practicing pharmacists in the area of veterinary pharmacy

Since qualifying the vast majority (96%) had not undertaken any further education in veterinary pharmacy. The remaining number (4%) had completed the RPS veterinary pharmacy diploma. Of significance, the majority (96%) supported delivery of veterinary pharmacy to undergraduate students. The minority who disagreed (all hospital pharmacists) indicated that tuition on this subject should be delivered through non-core specialist postgraduate study, to be undertaken by pharmacists if desired (Table 2). However a division of opinion was evident regarding views towards pharmacists undertaking further

postgraduate study to increase knowledge of veterinary medicines. A small majority (57%) were in favour, through the forum of on-line distance-learning courses (Table 2).

Exposure to Veterinary Pharmacy

The number of respondents totalled 95; excluding the 28 pharmacists respondents that considered themselves non-practice (having no exposure to animals, animal healthcare professionals or the general public); the remaining 67 participants (community and hospital pharmacists) had a variety of experience with veterinary pharmacy. Some (36%) confirmed they had no experience in animal treatment, while almost two-thirds of pharmacists (64%) had been involved in delivery of medicines to various animal species (Table 3).

Involvement/exposure to veterinary pharmacy	**Yes**		**No**		**Total**
	43		24		67
Species of animal treated	**Small animal**	**Farm animal**	**Equines**	**Other**	**Total**
	39	22	16	4	81

Table 3: Level of pharmacist participation with veterinary pharmacy and animal species dispensed for

Indeed, 60% indicated they had been involved in the treatment of more than one animal class, with companion animals (dogs, cats, rabbits or fish) most commonly encountered (48%), livestock (bovine, ovine or porcine) (27%), equines (20%) and occasionally some exotic species such as seals, tortoises or even elephants (5%) (Table 3).

Veterinary Pharmacy Practice

When asked whether they had dispensed human medicines for veterinary use, almost two-thirds (64%) of the practice-based pharmacists had done so (Table 4). It was also confirmed that many of the pharmacists (81%) had been approached by the general public for advice on the use of veterinary medicines. In these situations lack of knowledge of veterinary medicines prompted many (67%) to refer the queries to a veterinary surgeon for further advice. Significantly, many pharmacists (67%) had been approached by veterinary surgeons or other animal healthcare professionals on the appropriate use of medicines intended for use by humans for veterinary application (Table 4).

Whether they had dispensed a human medicine for veterinary use?	**Yes**	**No**	**Total**
	43	24	67
Whether a member of the public had ever requested advice on veterinary medicines	**Yes**	**No**	**Total**
	54	13	67
Whether they had subsequently referred a member of the public to a veterinary surgeon due to lack of knowledge of veterinary medicines	**Yes**	**No**	**Total**
	45	22	67
Whether a veterinary surgeon or other healthcare professional had consulted them regarding human medicines for veterinary use	**Yes**	**No**	**Total**
	45	22	67

Table 4: Level of pharmacist interaction with animal healthcare professionals and members of the public

In regards to dispensing prescriptions for veterinary use (Table 5) a lack of knowledge of veterinary medicines was the reason many (46%) did not do so. Of those that had done, when questioned as to reference sources used to check prescriptions prior to dispensing, a substantial number (44%) revealed that they had not performed any checks due to unfamiliarity with suitable relevant reference sources (Table 5).

Whether they had performed a check prior to dispensing a medicine for veterinary use	**Yes**		**No**	**Total**
	29		38	67
Whether a lack of information on veterinary medicines had prevented them from dispensing a prescription for veterinary use	**Yes**		**No**	**Total**
	31		36	67
Reference source used to check veterinary prescription	**Manufacturer**	**Vet**	**Internet**	**Other**
	14	13	14	15

Table 5: Reference sources used or consulted by pharmacists to check veterinary pharmacy prescriptions

Those undertaking checks used one or more sources and cited manufacturers (15%), Internet sources (15%) or contacting the prescribing veterinary surgeon (14%) along with other methods for checking (16%) such as consulting a textbook or colleague.

Expanding Pharmacy Services

It was ascertained that stocks of veterinary medicines were held by the majority (55%) of community pharmacies (Table 6). Although expanding pharmacy services through enhanced stocking of veterinary medicines was considered positively by some (30%) and negatively by others

(15%), the majority of pharmacists (55%) felt themselves insufficiently familiar with the practice of veterinary pharmacy to make an informed decision (Table 6).

Whether their pharmacy stocks veterinary medicines or not	**Yes**	**No**		**Total**
	37	30		67
Whether stocking veterinary medicines would be a viable addition to services provided by pharmacies	**Yes**	**No**	**Don't know**	**Total**
	20	10	37	67

Table 6: Stocks of veterinary medicines and expansion of pharmacy services

Additional Written Comments Received

Nearly half of the returned questionnaires (44%) had additional written comments. Several common themes were identified from these entries (Table 7).

Theme 1: Participation by pharmacists in veterinary pharmacy (37%)	*"Totally neglected area by pharmacists due to lack of knowledge"* *"I have only ever worked in rural areas and knowledge of vet pharm would have been useful"* *"Involves medicines therefore pharmacists should be aware of this area".* *"You never know what you may come across during your practice, so important to be aware of veterinary medicines"*
Theme 2: Undergraduate and Postgraduate Pharmacy Tuition (22%)	*"The content within the degree course should be modest but give the necessary signposting on to further learning and resources"* *"Received no information on veterinary pharmacy as students and now we have this big gap in our knowledge"* *"Pharmacists' are asked about veterinary medicines by members of the public who expect them to know about them but we don't because veterinary medicines were not mentioned in Uni except for the legal requirements for veterinary prescriptions"* *"I have only ever worked in rural areas and I have often had to admit my lack of knowledge of veterinary medicines, all pharmacy students should be taught about veterinary drugs"* *"All pharmacists should have an understanding of the scope of this practice to give opportunities for the sector's development"*
Theme 3: Future Pharmacist roles (11%)	*Future roles farm health planning and advising vets on specialist use of human medicines"* *"Role in public health too"* *"Broader career prospects"*
Theme 4: Veterinary prescription checks (10%)	*"It troubles me to dispense veterinary prescriptions without checking but I don't have the information I need to do this"* *"I am unable to assess the suitability of vet prescriptions"* *"More information on veterinary medicines should be readily available"* *"GPhC requirement but how to do this....."*

Discussion

Results from this research study revealed the main factor limiting pharmacists' current interaction with veterinary pharmacy as being their lack of knowledge of veterinary medicines. Pharmacists themselves viewed veterinary pharmacy as a neglected area of practice with which they are not actively involved. The lack of knowledge of veterinary medicines stems from the fact that the majority of study participants received either insufficient or no tuition in veterinary pharmacy as undergraduate students and they had not undertaken postgraduate study in this subject since graduation. This negatively impacts on their ability to confidently practice veterinary pharmacy.[20-21,23] Pharmacists dispensing veterinary prescriptions commonly rely on veterinary surgeons for accurate and appropriate medicine dosing as many do not perform prescription checks. This study confirms previous findings of poor interaction by UK pharmacists in this area of pharmaceutical practice and provides an explanation for the limited number of pharmacies specialising in veterinary medicines.[20-21,24-25]

A strength of the study was that the views and opinions on veterinary pharmacy were gathered from pharmacists practicing in diverse professional roles, thus permitting a broad view of this area of pharmaceutical practice to be captured. The findings support the preliminary observations of an earlier study with a more limited population.[21] However it would have been beneficial to have had an even larger level of participation. The number of participants, capped at 100 due to time constraints, represents less than 0.01% of the 42,424 registered pharmacists currently practicing in the UK (Personal

communication: General Pharmaceutical Council 2014). Consequently the perspectives detailed above may not truly reflect the views of the profession as a whole. It would be very worthwhile undertaking a more substantive analysis to better capture the participation level with and attitudes towards practice of veterinary pharmacy.

Almost all respondents were in agreement that suitable tuition on veterinary pharmacy should be delivered to all undergraduate pharmacy students, thus ensuring a commonality of basic knowledge on this subject by all future pharmacists. Pharmacists' views were that this fundamental basic knowledge could then be added to as desired through completion of further postgraduate specialist study or through participating with continuing professional development courses. Though information on veterinary pharmacy was provided in the undergraduate syllabus by Schools of Pharmacy in the UK, delivery mostly focussed on the veterinary cascade and UK veterinary pharmaceutical legislation.[21] The revised GPhC standards for the initial education and training of pharmacists have increased the emphasis on tuition of veterinary pharmacy which should address the issue of lack of knowledge in the future generation of pharmacists practicing in the UK.[18]

More than half the participating pharmacists revealed a willingness to undertake further study in veterinary medicines preferably via an on-line forum. This was an interesting revelation as currently there is a part-time course in veterinary pharmacy endorsed by the Royal Pharmaceutical Society of Great Britain and delivered by Harper Adams University leading to a Master of Science qualification after three/four year's duration of part-time distance learning in a non-attendance based mode.[26] This

qualification is aimed at those pharmacists with current or intended participation in animal healthcare through the supply/use of veterinary medicinal products. [26] No study respondent had however undertaken this course; perhaps the lengthy time frame of this course is off-putting and as such maybe shorter courses focussing on a particular area of veterinary pharmacy would be preferred.

A comparison could be made with the tuition available for training a suitably qualified person (SQP) or animal medicine advisor.[20] On completion of a much more limited distance learning module, within a defined timescale of 13 months, an SQP is legally entitled under the Veterinary Medicines Regulations to prescribe and supply medicines from a specified category of medicine for animals in their care.[20,27] Completion of additional modules permits expansion of prescribing by SQPs.[20,27] Currently there are in excess of 5,000 SQPs involved with prescribing, supplying and advising members of the public on the use of veterinary medicines in the UK, while participation by pharmacists with veterinary medicines has been established previously[20] and is confirmed in this investigation, to be poor.

One of the findings of this research is that a proportion of both community and hospital pharmacies stock veterinary medicines to some extent. These veterinary medicines are purchased from pharmacy wholesalers who carry limited stock of these medicines, with direct purchasing from veterinary manufacturers uncommon due generally to the low order volume of products required by pharmacies, while veterinary drug distributors rarely supply pharmacies. Earlier research has shown,[20] and this study confirms that hospital pharmacies stock veterinary medicines for human use, in

particular those products not licensed for humans. An example of this is the use of ketamine, an equine anaesthetic used off-label for the alleviation of pain in human patients, as no equivalent human formulation is available. Physicians have the right (on their own responsibility) to prescribe anything they think appropriate for their patient however in the event of adverse events, the doctor would be held responsible.

However pharmacists revealed their involvement in animal therapeutics is hampered for several reasons by their lack of knowledge of veterinary medicines. Firstly, insufficient knowledge stopped more than half respondents from dispensing veterinary prescriptions. Secondly a substantial number of pharmacists undertook no prescription check on veterinary prescriptions due to unfamiliarity with available reference resources. Thirdly, when consulted by members of the public for advice on veterinary medicines, nearly 70% of respondents had referred queries to a veterinary surgeon due to their poor knowledge of veterinary medicines.

That limitations, due to poor veterinary medicine knowledge base, were placed on professional activities was evident in the respondents' comments regarding veterinary prescriptions. Pharmacists' revealed their concern at not performing a prescription check on veterinary prescriptions, an automatic undertaking for human prescriptions. Medical practitioners and the general public are secure in the knowledge that a prescription check will occur before being dispensed by a pharmacist to confirm the appropriate dose and frequency of therapeutic medicine delivery will be supplied to their patients. Medical care of patients of any origin is compromised when such checks are omitted, as is clearly the case for animals as revealed by the current study.

Many study participants gave their opinion that the key to the future development and expansion of this sector of pharmaceutical practice is greater inter-professional collaboration and co-operation with veterinary surgeons and other animal healthcare professionals. This view has been confirmed by another recent research study on the topic of veterinary pharmacy.[21] Increased participation in veterinary pharmacy would potentially allow for improvement to the healthcare currently offered to non-human animal patients. A separation of prescribing and dispensing by veterinary surgeons as currently occurs with medical practitioners and pharmacists with human medicines, is also felt to be the way forward in veterinary pharmacy. This could result in the establishment of dispensaries operated by pharmacists within veterinary practices. Perhaps a model for delivery of medical care could be multi-disciplinary with the development of medical practices offering medical care of patients by doctors and veterinary surgeons and the provision of medicines for all these patients dispensed by pharmacists. Expanding professional practice is available to those pharmacists in possession of a post-graduate diploma in veterinary pharmacy could seek a post with the Department of Environment, Food and Rural Affairs, commercial fisheries units or veterinary practices.

Delivery of increased tuition on veterinary medicine to undergraduate pharmacy students would enable them to participate more fully with veterinary pharmacy as practicing pharmacists. Recommendations for future veterinary pharmacy practice are the development of closer links between veterinary surgeons, animal healthcare professionals and pharmacists towards the goal of providing improved healthcare to non-

human patients. Provision of information on veterinary pharmacy in the current indicative syllabus for pharmacy undergraduate students in the UK and though requests by pharmacists for knowledge of veterinary pharmacy are limited, provision of postgraduate or continuing professional development courses for registered pharmacists, should facilitate increased interaction and participation by pharmacists with this neglected are of pharmacy practice.

Conclusions

The findings of this research suggest that currently there is poor interaction by pharmacists with veterinary pharmacy due to a lack of knowledge of veterinary medicines. As revealed by the majority of respondents, sufficient information on veterinary pharmacy had not been delivered to them during their undergraduate degree course, so skill sets necessary for their professional practice in veterinary pharmacy are lacking. The consequences of this are that pharmacists do not always dispense veterinary prescriptions presented to them. Similarly prescription checks on dispensed veterinary prescriptions are not always carried out by pharmacists. Consultations by members of the public on veterinary medicines have resulted in pharmacists advising those seeking guidance to contact their veterinary surgeon. These identified issues need to be addressed to permit full participation with veterinary pharmacy by pharmacists thoroughly familiar with veterinary medicines. Commonality of medicine usage in human and animal patients by pharmacists would, for example, help husband the efficacy of antimicrobial agents significantly. The current deficiency in the interaction and participation of

pharmacists with veterinary pharmacy practice could be addressed through increased provision of information on veterinary pharmacy in the indicative undergraduate syllabus for pharmacy students. Availability of continuing professional development and postgraduate courses for registered pharmacists should address delivery of increased information on veterinary pharmacy for practicing pharmacists.

Conflict of Interests

The authors declare no conflict of interest and the opinions expressed are personal views.

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Author contributions

All Authors participated in the study design, data analysis and manuscript preparation. All Authors state they had complete access to the study data that support this publication and read and approved the final manuscript.

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