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<Original Article>

A survey of the use of veterinary anesthetics in Korea

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Abstracts : This study was conducted to investigate actual conditions associated with veterinary anesthetic drug use in Korea, and to obtain responses from Korean veterinarians and researchers pertaining to the use of anesthetic drugs. To accomplish this, a nationwide survey was issued to veterinarians working at animal hospitals and to researchers in the Korean Association for Laboratory Animal Science (KALAS). A self-administered questionnaire-based survey was then conducted in which respondents were asked questions about actual conditions associated with the use of animal anesthetic drugs. The survey revealed that the distribution and management of animal medicines in Korea was quite vulnerable to misuse or abuse due to a variety of factors. Therefore, a relevant regulatory system should be strictly enforced to protect vulnerable individuals from abuse or misuse.

Keywords : anesthetic, drug abuse, prescription drug misuse, researchers, veterinarians

Introduction

Until the early 1980s, the misuse or abuse of drugs was not considered a social problem in Korea [12]. In contrast to the United State and European countries, Korea was named "a country free from drugs" by the United Nations, owing to low incidence of related crimes in past as well as recent years. However, problems associated with drug abuse and illicit trafficking have rapidly grown [12], as evidenced by the continual increases in the number of drug offenders arrested in Korea from 4,090 in 2005, to 4,985 in 2006, 7,134 in 2007, 6,798 in 2008, and 8,261 in 2009.

In the past, the majority of drugs abused in Korea were methamphetamines [9]; however, new substances, including veterinary anesthetics and analgesics, have since been distributed in Korea. Some anesthetics, including Zoletil, are classified as schedule 3, and are strictly regulated by the U.S. Drug Enforcement Administration. Conversely, the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) has not enforced the regulation of the use of Zoletil. However, a survey in 17 European countries revealed that Zoletil required a veterinary prescription in 8 countries, but was not considered a therapeutic in the 9 remaining countries. Similarly, Xylazine required a veterinary prescription in 11 countries, but was not regarded as a pharmaceutical in 6 other countries. A survey of the Ministry of Health, Labor, and Welfare of Japan drug control manuals and guidelines for psychotropic drugs revealed that Zoletil was not considered a pharmaceutical, and its ingredient could not be sold. In contrast, unregulated animal drugs, such as Zoletil and Xylazine, which can be easily obtained by anyone from a pharmacy without veterinarian's prescription, are primary problems in Korea. Owing to their detrimental physical and psychological effects on humans [1, 7, 8, 11, 13, 14], the illegal circulation of these drugs should be prohibited. Although the abuse of unregulated drugs represents only a small portion of total drug abuse, the importance of the abuse depends directly on how easily these drugs are available to the public and on how easily they can be purchased [10].

This is the first study to report on the status of animal drug management practices among veterinarians and researchers in Korea, based on data that were collected from on-line, e-mail, domestic mail, and on-site surveys. This work represents the current state of animal anesthetics use in Korea, and provides suggestions for the protection of vulnerable social members from the abuse or misuse of these substances.

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Table 1. Description of survey responses regarding misuse and abuse of anesthetic veterinary drugs

Survey subjects	Respondent (person)	Distribution (number)	Response rate (%)	Period of survey	Survey method
Veterinarians in small animal hospital	224	850	26.4	2011.08.09~08.31	Domestic mail, e-mail, on-line
Veterinarians in large animal hospital	21	90	23.3	2011.09.30~10.18	Domestic mail
KALAS members	38	100	38.0	2011.8.26	On-site survey

KALAS: Korean Association for Laboratory Animal Science

Materials and Methods

Data sources and collection methods

To understand the present use and management practices of veterinary anesthetics in Korea, a national survey was conducted among small and large animal hospital veterinarians. Moreover, a questionnaire was issued to researchers who conducted studies involving the use of animal anesthetics at the 2011 annual meeting of the Korean Association for Laboratory Animal Science (KALAS). The defined population was selected owing to their extensive experience in and exposure to the management and abuse of veterinary substances, respectively. This investigation was supported and approved by the Korean Veterinary Medical Association (KVMA), the Korean Animal Hospital Association (KAHA), and KALAS headquarters.

Data analysis

The content included in the survey was as follows: (a) user sense of responsibility; (b) experience of loss and theft of drugs; (c) where drugs were purchased; (d) how drugs were bought; (e) method for receipt of drug orders; (f) drug storage conditions; and (g) education on usage and management of drugs. The survey subjects, number of respondents and related distribution, response rate, survey period, and methods are presented in Table 1. Of the 850 and 90 surveys distributed to national small and large animal hospitals in Korea, respectively, 224 and 21 responses were returned (response rate: 26.4% *vs*. 23.3%, respectively). Additionally, 38 answers were returned from 100 KALAS members (response rate: 38%). Using domestic mail, e-mail, and other online methods, questionnaires were sent to small animal hospitals within Korea. In the case of veterinarians in large animal hospitals, domestic mail was used for the distribution of the survey because the majority of these veterinarians were older, and could have difficulty dealing with internet based questionnaires. Last, an on-site survey was conducted at the KALAS meeting conference, with attempts to limit the administration of the survey to 1 individual per participating institution. The collected data were analyzed by using the Pivot Table function in Microsoft Office Excel 2007 (Microsoft, USA).

Results

A sense of responsibility and experience regarding theft of anesthetic veterinary drugs

According to the survey results, 173 veterinarians in small animal hospitals (77.2 %), and 16 veterinarians in large animal hospitals (76.2%) responded that they had a "high" sense of responsibility regarding anesthetic drugs (Fig. 1A). Additionally, 35 veterinarians in small animal hospitals (15.6%), and 4 veterinarians in large animal hospitals (19.0%) responded that their sense of responsibility regarding anesthetic drugs was "medium." Conversely, 16 veterinarians in small animal hospitals (7.2%), and 1 veterinarian from a large animal hospital (4.8%) indicated that their level of responsibility was "low."

Fig. 1B indicates that the theft of veterinary anesthetic drugs was experienced in 2 small animal hospitals (0.9%), as well as in 1 large animal hospital (4.8%), while 10 small animal hospitals (4.5%), 2 large animal hospital (9.5%) and 6 KALAS members (15.8%) reported suspected thefts in their respective hospitals. In contrast, most veterinarians and researchers, specifically 212 small animal hospitals (94.6%), 19 large animal hospitals (90.5%) and 32 KALAS members (84.2%), reported no experience in the theft or loss of veterinary anesthetics.

Where and how veterinary drugs were purchased

The survey of sources for purchasing veterinary anesthetic substances (Fig. 2A) revealed that animal medicine agencies (wholesale stores) occupied 189 small animal hospitals (84.4%) and 19 large animal hospitals (90.5%). Additionally, human pharmacies and animal medicine agencies (retail stores) occupied 80 small animal hospitals (35.7%) and 6 large animal hospitals (28.6%).

The survey of methods of ordering anesthetics (Fig. 2B) revealed that estimate or purchase sheets were used in 32 small animal hospitals (14.3%), 1 large animal hospital (4.8%), and by 35 KALAS members (92%). Phone orders were used in 200 small animal hospitals (89.3%), 20 large animal hospitals (95.2%) and by 3 KALAS member (8%). Only 5 small animal hospitals (2.2%) reported ordering anesthetics or sedatives over the internet.

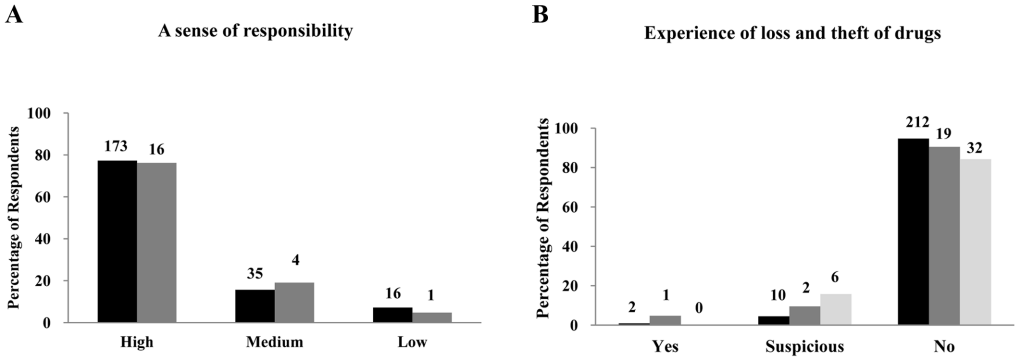

Fig. 1. (A) The veterinarian sense of responsibility regarding animal anesthetics is expressed as "High," "Medium," and "Low." (B) Illustration of experiences with loss and theft of drugs. The numerical values above each graph indicate the number of respondents. ■ Veterinarian in Small Animal Hospital, ■ Veterinarian in Large Animal Hospital, ■ KALAS member.

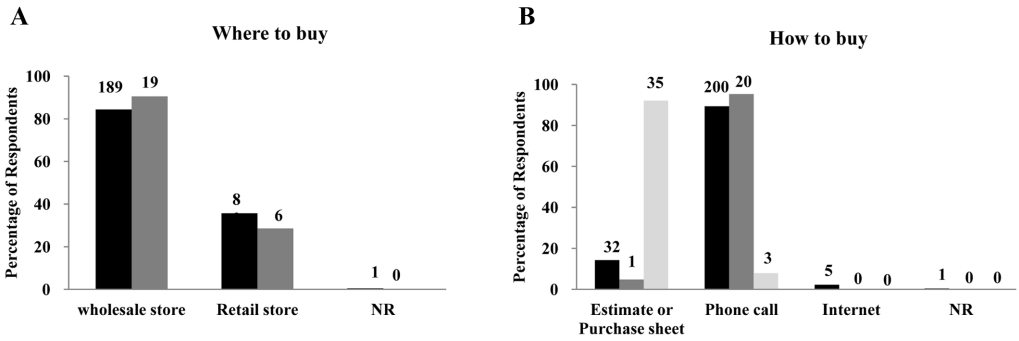

Fig. 2. (A) Stores where veterinary anesthetic substances are purchased are classified by "Wholesale store" and "Retail store." (B) The methods of ordering anesthetics are sorted by "Estimate sheet," "Phone call," and "Internet." The numerical value above each graph indicates the number of respondents. ■ Veterinarian in Small Animal Hospital, ■ Veterinarian in Large Animal Hospital, ■ KALAS member.

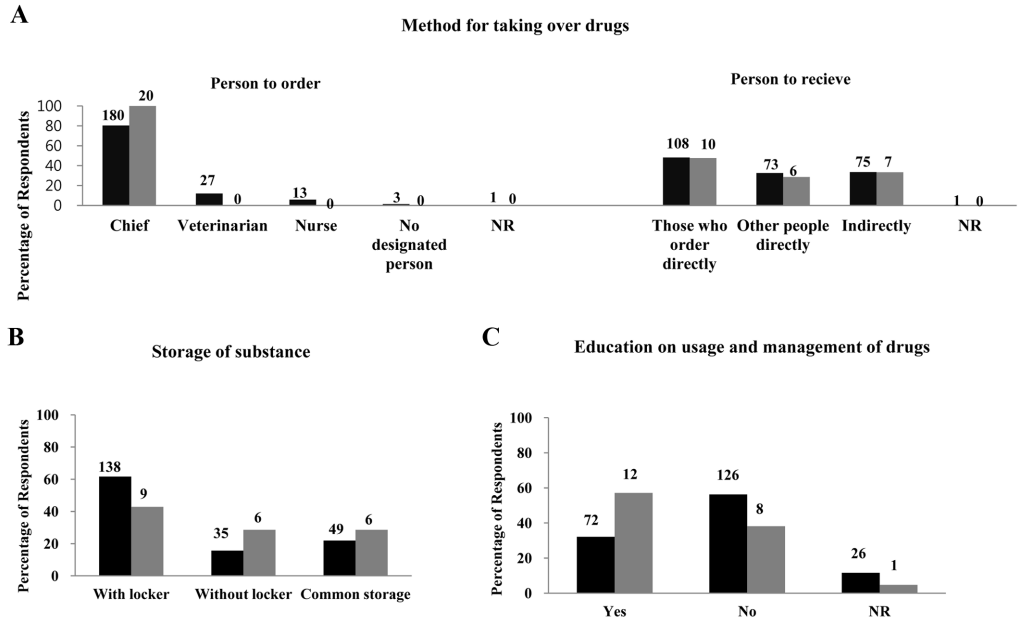

Fig. 3. (A) Illustration of individuals who manage the ordering of veterinary anesthetics and of those who receive the orders. (B) Classification of drug storage methods. (C) Description of education on usage and management of drugs. The numerical value above each graph indicates the number of respondents. ■ Veterinarian in Small Animal Hospital, ■ Veterinarian in Large Animal Hospital, ■ KALAS member.

The status of veterinary drug management in animal hospitals

The survey results revealed that 180 chiefs (80.4%), 27 veterinarians (12.1%), 13 nurses (5.8%), and 3 individuals (1.3%) in small animal hospitals, as well as 21 chiefs in large animal hospitals (100%), were responsible for the management of veterinary anesthetic purchasing (Fig. 3A). Those who ordered veterinary anesthetics were also the direct recipients of orders in 108 small animal hospitals (48.2%) and 10 large animal hospitals (47.6%). In the remaining facilities, including 73 small animal hospitals (32.6%) and 6 large animal hospitals (28.6%), someone other than the individual who placed the order was responsible for the receipt of the drugs. Furthermore, in 75 small animal hospitals (33.5%) and 7 large animal hospitals (33.3%), receipt of drugs was taken over indirectly, by entities such as a delivery service.

The questionnaire results regarding the method of drug storage (Fig. 3B) revealed that 138 small animal hospitals (61.6%) and 9 large animal hospitals (42.9%) used a locked cabinet dedicated for anesthetic drugs. An unlocked cabinet dedicated for anesthetic drugs was used in 35 small animal hospitals (15.6%) and 6 large animal hospitals (28.6%). However, anesthetic drugs were kept in undedicated space with other common medicines in 49 small animal hospitals (21.9%), and 6 large animal hospitals (28.6%).

The results of the survey also showed that education on the use and management of animal medicines was conducted in 72 small animal hospitals (32.1%) and 12 large animal hospitals (57.1%). However, no training program was in place for hospital staff in 126 small animal hospitals (56.3%) and 8 large animal hospitals (38.1%). No responses were received from 26 small animal hospitals (11.6%) and 1 large animal hospital (4.8%; Fig. 3C).

Discussion

There is a growing tendency towards crime and accidents involving drug use worldwide [2]. Although the crime and accident rates in Korea are relatively low, many people are concerned that rates are increasing annually. Further, new types of drugs, including animal anesthetics, have emerged and are being circulated in Korea without any specialized mechanisms of control. These anesthetics are not only traded on the illicit market under different names, but are also openly sold without restrictions to the public in some drugstores. Current conditions could be the cause of the resulting misuse and abuse of veterinary anesthetics, as well as possible socio-economic losses [3]. The main goals of the survey were to determine the actual state of animal anesthetic drug use, and to inform the public on survey responses from veterinarians and researchers in Korea.

The results of the current survey indicated that the proportion of veterinarians who answered “very high,” “high,” or “normal” to the questionnaire regarding a sense of responsibility for anesthetic substances was likely to be greater in small and large animal hospitals. Conversely, the percent of individuals who experienced or suspected theft of veterinary therapeutics was likely to be low in the both animal hospitals, and among KALAS members. However, the survey revealed that the distribution and management of veterinary pharmaceuticals was very vulnerable in Korea, despite the elevated sense of responsibility indicated by veterinarians, and the low incidence of theft.

First, the primary locations where veterinary anesthetic drugs were purchased included wholesale or retail stores in Korea. However, a mixture of sources can cause an uncertain distribution structure and result in price increases. Additionally, drugs have been circulated and sold by unauthorized persons, which leads to the careless management of therapeutics by local Korean agents. While the proportion of KALAS members who ordered drugs using an estimate sheet was greater than the number that ordered drugs over the phone, the majority of veterinarians in animal hospitals indicated that the ordering of drugs over the phone was their primary method of ordering anesthetics. Although frequent ordering over the phone could make it easier to acquire the drugs, this method could introduce problems, in that anyone can buy animal anesthetics without specific regulations, and the store cannot confirm whether the actual intended use is for animals. Therefore, one solution could be to require users to purchase pharmaceuticals only from legally designated institutions, and to have a plan that includes a description of intended use. Among OECD members, Korea is the only nation that does not have relevant laws and regulations regarding the requirement for a veterinary prescription. Therefore, relevant laws and regulations are required immediately to protect the vulnerable from abusing and misusing the veterinary prescription system. Through various studies, including the current research, relevant laws and regulations were established and became effective in 2013. As a result, unregulated animal drugs require a veterinarian’s prescription in order to be obtained in Korea. Especially, Zoletil came to be managed by being separated as psychotropic drugs. However, the risk of abusing unregulated animal drugs and avoiding restrictions remains. Therefore, a relevant regulatory system should be strictly enforced to protect vulnerable individuals from abuse and misuse.

The procedures pertaining to assuming responsibility for the receipt of drugs that are ordered was also problematic. A large amount of disparity existed between those who placed orders for drugs and those who received drug orders. The instances where a drug was received indirectly (*e.g.* through a delivery service) were likely to be frequent. These situations could be directly connected to loss of animal drugs, as well as loose management practices that enable unauthorized individuals to purchase drugs. Additionally, indirect receipt of drug orders could result in the increased possibility of illegal treatment and crime involving animal anesthetics.

In the present study, quite a few veterinarians did not employ the use of a dedicated locked narcotics cabinet.

Under Article 15 of the Controlled Substance Law in Korea, drug handlers have to keep narcotic drugs separate from other common medicines and use a solid cabinet with lock for storage [4]. The improvement of storage systems is necessary because there is high probability of loss and theft of anesthetics and sedatives, even those not designated as drugs.

According to the survey results, very few animal hospitals had an established program related to training employees on the use and management of animal medicines. Drug abuse awareness training is believed to decrease the frequency of drug-related incidents [15]. However, previous education has dealt with these problems ineffectually [5, 6]. Under Article 50 of the Controlled Substance Law in Korea [4], drug-handlers, including those who establish animal hospitals or become clinical veterinarians, are required to take a 2-h training the year following the receipt of their medical drug-handler license. Given these situations, training and education on the management of drugs in Korea is likely to be both insufficient and ineffective. To improve the current state of veterinary drug regulation, the following systems are required: (1) the appointment of a supervisor to manage anesthetic drugs in each veterinary hospital, and (2) the execution of regular education and training regarding the importance of drug management.

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