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Assessing occupational hazards among Indian wildlife health professionals

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ABSTRACT

A study to assess the levels of various threats and awareness among wildlife health professionals was carried out using a self administered questionnaire that focused on personal health details, the extent of exposure to various hazards, safety measures practiced and awareness level. Fifty four (46.9%) veterinarians responded to the questionnaire. The study suggests that animal related injuries (bites, wounds, scratches, fractures) were the major hazard (41%). Other health related problems and illness among professionals were backache (29.6%), hypertension (21.2%), lumbar spondylitis and anxiety (15.6% each), allergies/wheezing (11%), diabetes (10.5%), cervical spondylitis (9.4%), enteric disorders (8.9%), hypotension (5.9%), hypercholesterolemia (4.5%) and dermatitis (2.3%). Though 69% of the respondents handled hazardous chemicals during wildlife practice, none reported any mishap. Response to the presence of zoonotic diseases revealed a low level (3.7%) among the wildlife health professionals. The study revealed that despite near optimal awareness of various hazards, preventive measures are minimally practiced. It may be concluded that wildlife health professionals are exposed to a variety of hazardous situations during wildlife practice and need to remain diligent to ensure their own continued good health and that of the staff working under their supervision.

Key words: occupational hazards, questionnaire survey, veterinarians, preventive measures, India

Introduction

Wildlife health professionals, by virtue of their profession, are frequently exposed to various occupational hazards during their service and are at greater risk than that of the general population. These professionals face unique, numerous and diverse hazards that are not only associated with the animals but also the environment they work in (MOORE et al., 1993, LANGLEY et al., 1995). The demands of the profession expose veterinarians to

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various risks that include traumatic injuries while handling animals, exposure to infectious diseases transmitted by the animals or their parasites (ROBERTS, 1995), exposure to hazardous chemicals and drugs used in veterinary practices or they may even experience allergies while handling animals and their products and may sustain mental/psychological stress (HILL et al., 1998).

Accordingly these risks are classified as the physical, biological, chemical, mental and allergic hazards of veterinary profession (FRITSCHI et al., 2008). The few studies conducted to assess the vulnerability of veterinarians are suggestive of the increased susceptibility to various occupational hazards, however information on the prevalence of these hazards and preventive measures required while working with wild animals or in their habitats is limited.

Wildlife health services in India are provided by veterinarians from the State Animal Husbandry (A.H) department on deputation to forest department and captive facilities, those working in veterinary/ research institutions as experts and those employed with voluntary organizations. Though few studies on occupational hazards among veterinary professionals in the country have been carried out (AGASTHYA et al., 2007; AJAY and NANU, 2005; MATHUR and AMARNATH, 2008; SAIYED and TIWARI, 2004), information from Indian wildlife veterinarians is altogether lacking. To address this lacuna in information among this group, a study was initiated in 2008. The primary objective was to assess the occupational hazards among Indian wildlife health professionals, obtain information on the preventive health measures taken and assess the level of awareness about these hazards.

Materials and methods

The study was restricted to Indian veterinarians spread across the country providing services to captive and free ranging wild animals either on a full time or occasional basis. The data were obtained using a self administered postal questionnaire that was administered in September 2008 to 115 veterinarians who were known to be practicing wildlife health. The survey design and procedures were adapted as per DILMAN, 1978.

A total of 21 questions encompassing various aspects formed part of the questionnaire. These included questions on personal details and health information (age, sex, occupational health related problems, preventive medicine); details of professional service and wildlife health practice (no. of years in wildlife practice, employment categories, preventive measures, physical injuries, chemical exposure, zoonotic infection etc.) and level of awareness (awareness of risks involved in veterinary practice, need for information).

Occupational hazards and illness were broadly grouped into physical injuries (bites, wounds, fractures and trauma); chemical exposure (anesthetic agents including narcotics and immobilizing agents, pesticides, formalin, and disinfectants/sterilants); zoonotic

infections and occupational health related problems (musculoskeletal injuries and disorders, gastrointestinal disorders, allergies and dermatitis and stress related problems). Details of preventive medicine (medical checkup, deworming, vaccination etc.) were part of the personal health information whereas the details of exposure to occupational hazards and preventive measures undertaken (hygiene practices and use of personal protective gear and equipment) were included in the wildlife practice.

Since the responses were not scaled variables, the data so collected was entered into the MS Excel program and percentage frequencies with standard deviation were derived. The survey was pre-tested on 12 veterinarians in early 2008 prior to the postal survey among the field veterinarians in Jharkhand state and their responses were included in the study.

Results

Demography. A total of 54 veterinarians including 52 males and 2 females responded to the questionnaire, thereby giving a response rate of 46.9%. The majority of the wildlife veterinarians fell into the age group of 41-45 years (27.8%) and details of other age groups are provided as Fig. 1.

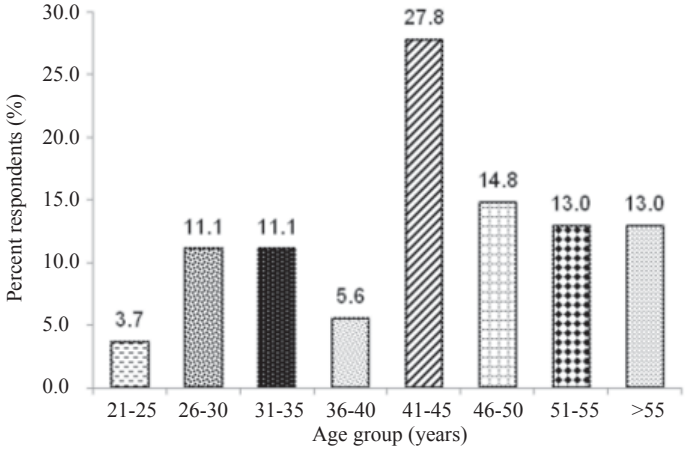

Fig. 1. Age profile of respondents

The average age of respondents was 43.9 (±1.99). The responses received regarding the number of years of wildlife practice revealed that 37.0% had been in service between 1-5 years, 24.0% between 5 to 10 years, 18.5% between 10-15 years, 9.3% between 15-20 years and 11.1% had more than 20 years of wildlife service. Twenty three (42.6%) and five (9.3%) of the respondents provided services in captive facilities and free ranging areas on

regular basis respectively. Fifteen (27.8%) of the respondents provided wildlife services in addition to their primary commitment in a veterinary research/teaching institution to both captive and free ranging wild animals as experts. Eleven (20.3%) of the respondents employed with the Government Animal Husbandry Department provided services on an occasional basis. The primary wildlife work included treatment of sick and injured animals, rescue and rehabilitation of wild animals in distress, management of orphaned and problem-causing wild animals, handling animals for research purposes and carrying out post mortem examination.

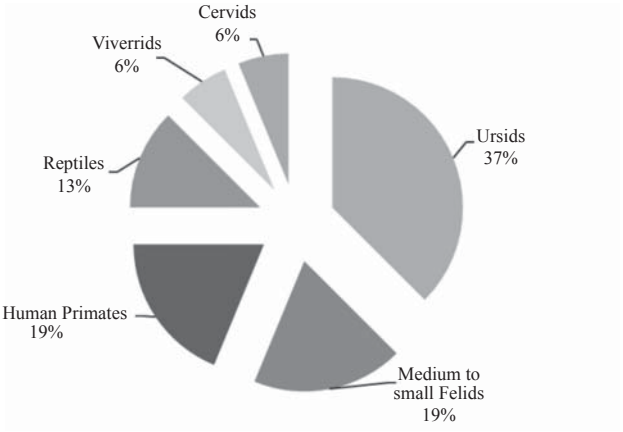

Fig. 2. Details of animals groups responsible for causing injures

*Hazards***.** A considerable proportion of the respondents (41%) had sustained physical injuries while handling wild animals that included animal bites, wounds, scratches and even fractures. The details of the specific injuries other than animal bites were not available. 20.3% of the respondents had been bitten by wild animals while providing treatment to sick, injured and orphaned animals or during wildlife rescue operations. The details of the animal groups responsible for causing injuries among the respondents are provided as Fig.2. The major animal species responsible were bears (*Ursus spp.*) and their cubs; small to medium felids like leopards (*Panthera pardus*), jungle cats (*Felis chaus*) and leopard cats (*Prionailurus bengalensis*); non human primates namely langur (*Semnopithecus* sp.), macaque (*Macaca mulatta*), slow loris (*Nycticebus bengalensis*);

reptiles like crocodiles (*Crocodylus palustris*) and pythons (*Python molurus*) and rarely civets (*Viverra* sp.*)* and cervids like sambars (*Rusa unicolor*).

Table 1. Details of health related problems and illness among Indian wildlife health professionals

Major Disorder groups	Health problems	Employment categories				
		Captivity	Free ranging areas	Veterinary institutions	Animal husbandry gept.	Pooled data
Musculo-skeletal disorders	Back ache	26.1	20.0	26.7	45.5	29.6
	Lumbar spondylitis	17.4	20.0	6.7	18.2	15.6
	Cervical spondylitis	4.3	20.0	13.3	0	9.4
Gastro-intestinal disorders	Enteric problem	17.4	0	0	18.2	8.9
Allergic reactions	Allergies/wheezing	17.4	20.0	6.7	0	11.0
Dermatitis	Dermatitis	0	0	0	9.1	2.3
Stress related problems	Diabetes	4.3	0	6. 7	27.3	10.5
	Hyper-cholesterolemia	4.3	0	6. 7	9.1	4.5
	Hypertension	17.4	20.0	20.0	27.3	21.2
	Hypotension	8.7	0	6. 7	9.1	5.9
	Anxiety	8.7	20.0	6. 7	18.2	15.6

The health related problems and illnesses amongst the sampled wildlife health professionals is summarized in Table 1. Musculo-skeletal disorders (backache and lumbar spondylitis) and stress related problems (hypertension and anxiety) were common to all employment categories. Analysis of the pooled data of health related problems revealed backache and hypertension to be the major problem that accounted for 29.6% and 21.2% of the respondents respectively. Other health problems in descending order were lumbar spondylitis (15.6%), anxiety (15.6%), allergies / wheezing (11%), diabetes (10.5%), cervical spondylitis (9.4%), enteric disorders (8.9%), hypotension (5.9%), hypercholesterolemia (4.5%) and dermatitis (2.3%). Though 29.6% of the respondents reported parental history of diabetes, none of the respondents having diabetes in the present study had any parental history. In contrast, seven (46.7%) of the 15 respondents having circulatory disorder (hypertension/hypotension) had parental history of the problem.

Responses on exposure to chemical hazards and related illness revealed that 69% of the respondents handled hazardous chemicals during their wildlife practice, however none reported any mishap. The common drugs and chemicals that are handled include disinfectants and antiseptics, preservatives, narcotics, anesthetics etc.

Wildlife health professionals work in an environment where chances of exposure to biological hazards are more, both in terms of diseases from animals as well as from the environment they work in. Though these threats are rampant, the information on biological hazards and the reporting of such cases is limited. Two (3.7%) respondents reported that they had been diagnosed with zoonotic diseases during their career. One of the respondents was positive for brucellosis though the second individual did not wish to disclose the information. Besides the above, there were other major health related problems associated with veterinary profession. These were broadly classified into five major groups in the questionnaire survey (*viz*. musculo-skeletal disorders; gastro-intestinal disorders; allergic reactions, dermatitis and stress related issues) The details of the health problems among the various employment categories is presented in Table 1.

Preventive measures. Forty-four percent of the respondent had a medical checkup during the last year, 22% reported having had a medical checkup in the last 1-2 years and 7% in the last 2-3 years. The majority of the respondents who had a routine medical checkup were either fresh entrants into the veterinary profession that had a medical checkup as part of the mandatory prerequisite prior to joining the service or had less than 5 years of service. Twenty-seven percent of the respondents did not have a medical checkup at all. The details of preventive measures taken by respondents were analyzed and the details are summarized in Fig. 3.

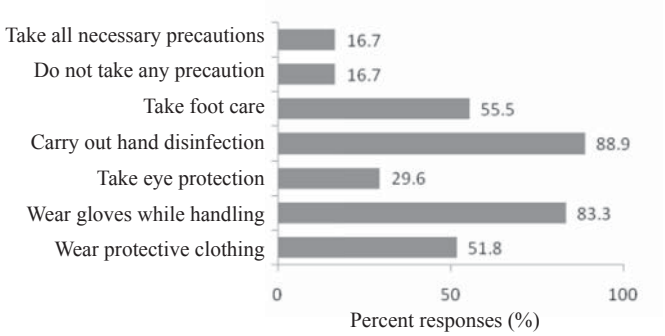

Fig. 3. Preventive measures taken by respondents during wildlife practice

Though the majority of respondents took one or the other form of protection, only 16.7% of the respondents took all available listed protection measures while handling

animals. Nine (16.7%) of the respondents did not take any protective measure as the services rendered were of a sudden/ emergency nature or they were in field conditions where these things were not available. The responses on the prophylactic measures taken revealed that thirty-four (62.9%) respondents had taken prophylactic treatment against rabies, 33 (61.1%) against tetanus, 6 (11.1%) against hepatitis A and 13 (24.1%) against hepatitis B. Seven individuals (12.9%) had not taken any prophylactic measures. The percent of respondents with up to date vaccination is not available. Fig. 4. provides details of prophylactic vaccinations carried out against single or multiple pathogens by the respondents. The details of deworming practiced by the veterinarians were analyzed and it was inferred that though 75.9% of the respondents practiced routine deworming, only 40.7% reported carrying out deworming in the last 6 months, 22.2% in the last 1 year and 12.9% had done it once in the last two years. 24.1% of the respondents did not practice routine deworming.

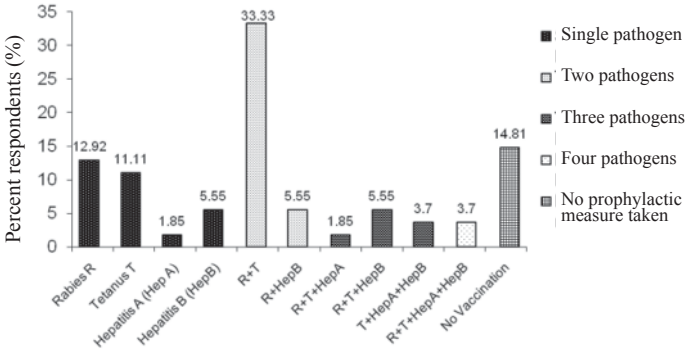

Fig. 4. Details of prophylactic vaccinations carried out by respondents

Awareness. The studies showed that the majority of the respondents were aware of one or other form of occupational hazards. 98% of the respondents were aware of the physical hazards, 87% of the biological hazards, 77.8% each for chemical hazards and allergies respectively. Though 18.5% of the respondents had made a personal effort to obtain information on occupational hazards related to wildlife practice, all the respondents felt a need for information on the occupational hazards as they felt it was lacking.

Discussion

Demographics. An analysis of the data obtained suggests male predominance in the profession of wildlife health care. Additional features that emerge are the preponderance of practitioners in their middle age (40 - 50 years) and the trends are similar to HILL et al. (1998), who carried out a similar survey of veterinary professionals in the United States

of America. A majority of wildlife health professionals in both India and USA practice in zoos either on a full time or part time basis. The obvious reason for this is that it is mandatory for all zoos to have either full time or at least part time veterinarians. Few individuals are able to pursue wildlife practices for longer periods as the services are primarily on a deputation basis and individuals return to their parent cadre, the Animal Husbandry Department on completion of terms of engagement. There is an apparent lack of secure permanent positions in the wildlife sector.

Hazards. Veterinarians may be exposed to various work related injuries (GABEL and GERBERICH, 2002; FRITSCHI et al., 2006) during wildlife practice that may be classified as physical hazards. These may vary from bite injuries, to trauma, fracture, dislocation and may even be fatal (LANGLEY and HUNTER, 2001). Data on injuries to practitioners while handling wild animals were extensive. It seems important to emphasize due care while restraining and handling wild animals; knowledge of specific animal needs and procedures is required alongside the use of relevant equipment and accessories while handling wild animals. Health related problems formed a major part of the occupational hazards reported. The reasons for this may be the ergonomically poor design of the work place, long working hours, which result in repeated micro-injuries that over a period of time assume severe proportions, resulting in conditions like spondylitis etc. Though the allergic reactions to animals and their products were not studied separately, these are emerging as an important health hazard associated with the profession. These are usually overlooked as specific diagnosis of the allergens among veterinary professionals is rarely carried out. The expression of allergic reactions may include respiratory, enteric and skin disorders, eye, nose and throat irritation and skin hives. The present study also revealed nonspecific health problems; as mentioned above among health professionals and wheezing, enteric disorders, dermatitis may have an allergic predisposition.

Though chemical hazards are an integral part of the veterinary profession, it seems relevant to reinforce good handling practices. Our study does not reveal any illness/ untoward incident following exposure to chemical hazards, however the threat from chemicals and drugs cannot be discounted and the literature suggests the relevance of these threats (BEAT and MORGAN, 1977; FRITSCHI, 2008).

Health problems form a significant part of the overall occupational hazards in wildlife practice. Various clinical and epidemiological studies have suggested the inherent risks that wildlife health professionals face *vis-à-vis* zoonotic infections, allergies, mental disorders, drug and chemical hazards, musculoskeletal injuries and disorders (CONSTABLE and HARRINGTON, 1982; FALK et al., 1985; BEAT and MORGAN, 1977). Brucellosis, salmonellosis, leptospirosis, listeriosis, rabies, mycotic infections, mange infection etc. are some of the important zoonosis (ROBERTS, 1995; McLEAN, 1994). Our findings are suggestive of a low level of zoonotic diseases being prevalent

in the sampled population. This is contrary to the reported levels and also the possible exposure levels. Possible reasons for this could be non-reporting/hesitation in disclosure of zoonotic diseases. A survey carried out by MUDALIAR et al. (2003) and RANA et al. (1985) showed sero-positivity against Brucellosis as high as 27.7% and 14.43% among veterinary workers in Delhi and Pune respectively. Wildlife health practitioners are exposed to various parasites during their service period. Though a disease may not be obvious, individuals may suffer from chronic infections that may ultimately affect their health. Amoebic dysentery, giardiasis, colitis, tapeworm and round worm infections are not uncommon among health professionals. It is therefore important to carry out routine deworming. The present survey however provided some information on the presence of disease among wildlife health professionals, which also showed the need for an intensive survey among this group. There seems to be a need to provide detailed information on the biological threats related to emerging zoonoses and their prevention for wildlife health professionals.

Preventive measures. Potential hazards of working with wild animals are numerous and diverse. Wildlife health professionals ignore the risks associated with handling wild animal species and those associated with working in natural (free ranging) or artificial (captive) environments. Regular health checkups are a valuable tool in knowing one's health status and also maintaining good health. Periodic health checkups and occasional serological monitoring for important infectious diseases are important tools to prevent and control disease and maintain health among wildlife professionals. It is essential to take relevant preventive measures while handling wild animals or their products. Diseases of wildlife or diseases present in their habitats can infect humans and some can cause serious illness or even death (McLEAN, 1994). Though veterinarians are aware of important zoonotic and work related diseases, the preventive measures are minimally practiced. It is important to sensitize and reinforce good practices among wildlife health professionals. This would not only address the issue of personal health but also would lead to avoidance of transmission of diseases to the animals during work. Prophylactic measures against major diseases and parasites among wildlife veterinarians need to be integral part of their health plan.

Awareness. Though the awareness levels regarding occupational hazards among the wildlife health professionals was near optimal, the need was felt to enforce efforts aimed at addressing prevention of occupational hazards by developing and implementing improved safe handling practices and safety precautions. Working protocols for various species and/or situations giving due emphasis to personal safety would help in reducing and preventing occupational injuries and illness among wildlife health professionals, besides dissemination of information through training programs and networking between professionals.

Conclusion

Working with wildlife involves potential risks to wildlife health professionals in terms of exposure to zoonotic diseases, physical injuries while handling and exposure to allergens, hazardous chemicals and animal waste. Though it may not be possible to completely prevent exposure to occupational hazards, these can be considerably reduced by developing working protocols for various species and situations, ensuring effective handling procedures; a clear understanding of the diseases with zoonotic potential and an emphasis on personal health.

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SAŽETAK

Provedeno je istraživanje s ciljem procjene stupnja različitih opasnosti i osviještenosti o tim opasnostima u specijalista za zaštitu zdravlja divljih životinja. Pripremljen je upitnik s pitanjima usmjerenima na podatke o osobnom zdravlju, opsegu izloženosti različitim opasnostima, primijenjenim mjerama zaštite i stupnju osviještenosti o opasnostima. Na upitnik su odgovorila 54 (46,9%) veterinara. Istraživanje je pokazalo da je glavna opasnost (41%) ozljeda do koje dolazi u radu sa životinjama (ugrizi, rane, ogrebotine, lomovi). Drugi poremećaji zdravlja odnosili su se na bol u leđima (29,6%), povišeni krvni tlak (21,2%), lumbalni spondilitis i anksioznost (svaki po 15,6%), alergije i otežano disanje (11%), šećernu bolest (10,5%), cervikalni spondilitis (9,4%), probavne poremećaje (8,9%), sniženi krvni tlak (5,9%), povišeni kolesterol (4,5%) i upala kože (2,3%). Iako se 69% ispitanika služilo opasnim kemikalijama tijekom rada s divljim životinjama, nije bilo odgovora o nesretnim slučajevima vezanima uz to. Odgovori o potvrđenim zoonozama bili su rijetki (3,7%). Istraživanje je pokazalo da se usprkos gotovo optimalnoj osviještenosti o različitim opasnostima, preventivne mjere malo primijenjuju. Može se zaključiti da su stručnjaci koji nadziru zdravlje divljih životinja izloženi različitim opasnostima tijekom obavljanja prakse i zbog toga trebaju ustrajati u održavanju svojeg zdravlja te dobrog zdravlja osoblja koje radi pod njihovim nadzorom.

Ključne riječi: radne opasnosti, upitnik, veterinari, zaštitne mjere, Indija