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Awareness of zoonoses in freshmen entering the veterinary school*

Conhecimento sobre zoonoses em um grupo de estudantes recém-matriculados no curso de medicina veterinária

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Abstract

In veterinary practice, the risk of zoonotic infections starts in College, when students are exposed to animals, and laboratory assignments. The objective of this study was to estimate awareness of zoonoses in a cohort of freshmen at the Facultad de Ciencias Veterinarias, Universidad Nacional del Litoral, Santa Fe (Argentina). A cross sectional study was conducted using a structured questionnaire in all students attending an introductory course (N= 179) on April, 2012. Data analysis included descriptive statistics and χ^2 . Zoonoses most frequently mentioned by students were rabies, scabies, tuberculosis and leptospirosis. Rural residence was associated with the recognition of ringworm ($P= 0.0136$), tuberculosis ($P= 0.0302$), leptospirosis ($P= 0.0205$) and hydatidosis ($P= 0.0167$) as zoonoses. Males showed higher awareness of trichinosis ($P= 0.0025$), tuberculosis ($P= 0.0286$), anthrax ($P= 0.0035$), and brucellosis ($P= 0.0038$) than females. Awareness of susceptible species and means of transmission varied among all zoonoses. These results reinforce the need for early exposure of veterinary students to occupational health and biosafety practices.

Keywords: hygiene, veterinary students, work security, zoonotic infections.

Resumo

No exercício da medicina veterinária, o risco de contrair zoonoses está presente desde o período estudantil, proporcionado pela exposição a animais e também a atividades laboratoriais. O objetivo deste estudo foi estimar o conhecimento sobre zoonoses em um grupo de estudantes recém-matriculados no curso de medicina veterinária da Universidade Nacional do Litoral, Santa Fe (Argentina). Realizou-se um estudo transversal utilizando-se um questionário pré-elaborado para todos os alunos recém-matriculados (N=179). A análise dos dados incluiu estatísticas descritivas e teste Qui-quadrado (X^2). As zoonoses mais citadas pelos alunos foram raiva, sarna, tuberculose e leptospirose. A variável “residir em áreas rurais” esteve associada ao reconhecimento de dermatofitoses ($P=0,0136$), tuberculose ($P=0,03020$), leptospirose ($P=0,0205$) e hidatidose ($P=0,0167$), como zoonoses. Da mesma forma, a variável “sexo masculino” esteve associada à identificação de triquinelose ($P=0,0025$), tuberculose ($P=0,0286$), carbúnculo hemático ($P=0,0035$) e brucelose ($P=0,0038$). O conhecimento sobre as formas de transmissão e as espécies acometidas variou de acordo com cada zoonose em particular. Esses resultados reforçam a necessidade de um contato mais precoce de estudantes de medicina veterinária com temas relacionados com a saúde ocupacional e práticas de biossegurança.

Palavras chave: higiene, estudantes de veterinária, segurança do trabalho, infecções zoonóticas.

Introduction

Veterinary practice implies a high risk for zoonotic diseases through contact with animals, their excretions, secretions, products and byproducts (Álvarez et al., 1990; Tarabla, 2009; Archer et al, 2011; Gómez de la Torre and Tarabla, 2011; Molineri et al., 2013; Van den Brom, 2013). Exposure to diseased animals, carriers or contaminated surfaces or objects takes place in college students (Gastaldi et al., 2003; Uehlinger et al, 2006; Cuny et al, 2008; Bender et al, 2012; Robin et al, 2012; Aklilu et al, 2013) and may trigger outbreaks of disease within the student community (Preiser et al, 2003; Heddema et al, 2006; Gait et al, 2008; Greenberg et al, 2011).

In Argentina the most frequent zoonosis are brucellosis, leptospirosis, echinococcosis, tuberculosis, triquinelosis,

toxoplasmosis, ascariasis, campylobacteriosis, salmonellosis, haemolytic uraemic syndrome (HUS), and anthrax (Barlasina et al, 2009; Larriue et al, 2002, Molineri et al, 2013, 2014; Olvera-Yabur et al, 2010; Rivero et al, 2013; Sequeira et al, 2013; Signorini and Frizzo, 2009; Signorini and Tarabla, 2009; Signorini et al, 2013; Vanasco et al, 2008; Zbrun et al, 2013). Rabies and viral encephalitis are also important as potential zoonosis.

With the exception of health workers (Cripps, 2000), the general population has a limited and fragmented knowledge of zoonoses (Castro Hurtado et al, 2003; Tarabla and Fernandez, 2009; Coniel Linares et al., 2012; Molineri et al., 2014). A high frequency of zoonotic infections and accidents on veterinary students (excessive sun exposure, animal bites and kicks, sharp injuries with hypodermic needles, etc.) was recorded (Robin et al, 2012). A joint effort is needed to prevent zoonotic diseases among veterinary students.

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The objective of this study was to estimate awareness of zoonoses in a cohort of freshmen at the Facultad de Ciencias Veterinarias, Universidad Nacional del Litoral, Argentina.

Materials and methods

In April 2012 a cross-sectional study was conducted at the Facultad de Ciencias Veterinarias, Universidad Nacional del Litoral, Esperanza, Santa Fe, Argentina (31°25'0"S 60°55'0"W). The unit of study was the freshman attending an introductory course prior to be exposed to the career curricula (N= 179). This course is taken once at the beginning of the veterinary school and included chemistry, biology, and mathematics. A closed structured questionnaire was applied for data gathering. Previously, the purpose and importance of the survey was explained and emphasis was stressed that the aim was not to grade knowledge in any given person, but on population-level frequencies. Students were asked not to identify themselves nor sign the paper. The questionnaire was divided into two sections: a) demographic characteristics of the respondent (age, sex, rural/ urban residence and home province) and b) awareness of zoonoses (brucellosis, leptospirosis, echinococcosis, tuberculosis, triquinelosis, toxoplasmosis, ascariasis, campylobacteriosis, salmonellosis, haemolytic uraemic syndrome (HUS), anthrax, scabies, ringworm, rabies, influenza, and viral encephalitis), their hosts and means of transmission. In both cases awareness was classified as: knew all, some or none of hosts or means.

Statistical analyses included Pearson chi square test of independence (χ^2), Student's t-test, Pearson's and Spearman's correlation coefficient. All variables with a significance value $P < 0.05$ were selected. All statistical analysis was performed using InfoStat® (Universidad Nacional de Córdoba, Argentina).

Results

Respondents were 18.5 ± 1.9 years old, coming mainly from the provinces of Santa Fe (56%), Entre Ríos (26%) and Córdoba (12%). Fifty five percent were males and 81% lived in urban areas.

In our study, 82% of freshmen knew the meaning of the word zoonoses. Nevertheless, the proportion of respondents who recognized diseases included in the questionnaire as zoonoses was variable. Highest ranked diseases were rabies, scabies, tuberculosis (TB) and leptospirosis (Figure 1). Residence and sex were independent from each other ($P = 0.9527$). Rural residence was associated with the recognition of ringworm ($P = 0.0136$), TB ($P = 0.0302$), leptospirosis ($P = 0.0205$) and hydatidosis/ echinococcosis ($P = 0.0167$) as zoonoses. A higher proportion of males than females identified trichinosis ($P = 0.0025$), TB ($P = 0.0286$), anthrax ($P = 0.0035$) and brucellosis ($P = 0.0038$) as zoonotic diseases.

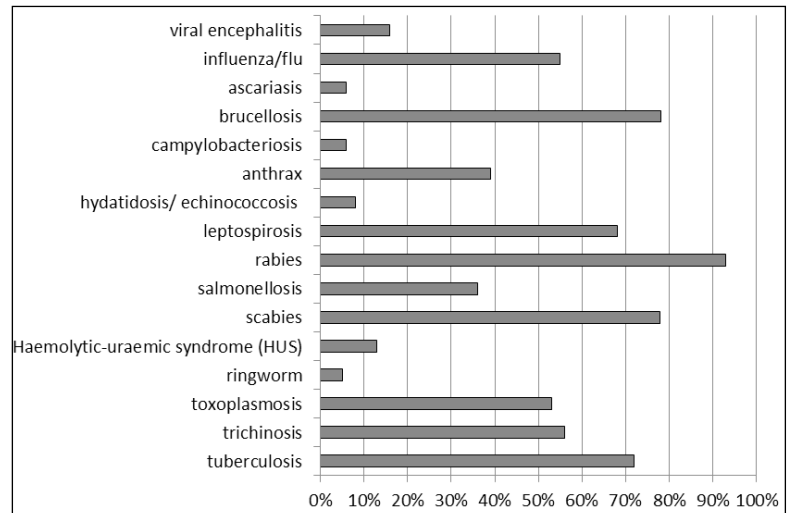


Figure 1: Proportion of respondents (%) who recognized diseases included in the questionnaire as zoonoses

In cattle, students correctly identified direct transmission of brucellosis (63%), TB (50%), anthrax (36%) and leptospirosis (15%), whereas indirect transmission by vehicles was identified only by 53, 38 and 23% of respondents, respectively. In swine, food-borne transmission of trichinosis was recognized by 38% of respondents. Although 12% mentioned salmonellosis as a food-borne disease, campylobacteriosis was mentioned by only two respondents. Few respondents ($n = 7$) recognized the horse as a potential source of vector-borne viral encephalitis. Wildlife was correctly identified as reservoirs of leptospirosis and TB by 26% of respondents. Although the cat was identified as source for indirect transmission (12%) of toxoplasmosis, consumption of beef, sheep, swine or wildlife products was mentioned by less than 1% of students (Figure 2).

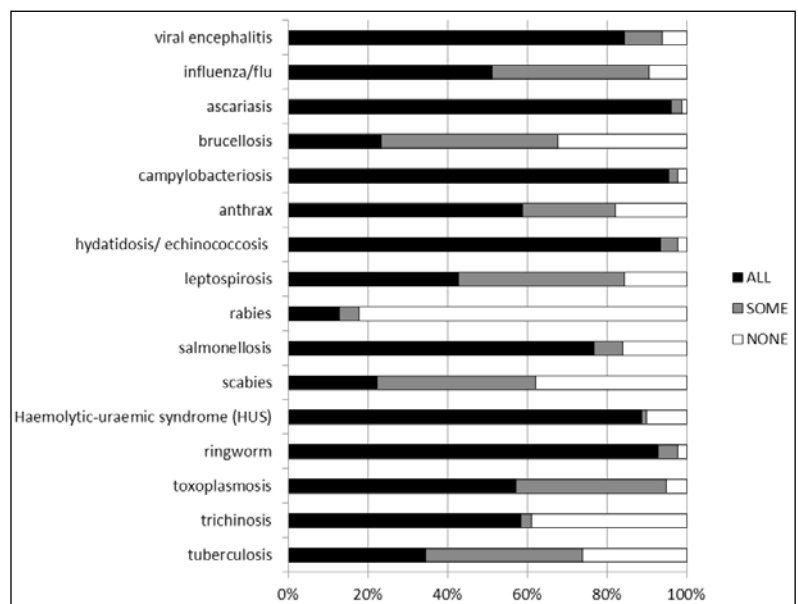


Figure 2: Proportion of respondents (%) who recognized modes of transmission of zoonotic agents included in the questionnaire

Direct transmission of rabies from dogs was identified by 87% of respondents, but involvement of wildlife and cats was mentioned by only 32% and 26% of students, respectively. Direct transmission of some types of influenza was correctly recognized from poultry (34%), swine (23%) and wildlife (12%). In the case of scabies, this means of transmission was mentioned for dogs (75%), cats (47%), cattle (12%) and sheep (7%). However, ringworm was only mentioned by eight respondents in the case of cats and five in dogs (Figure 3).

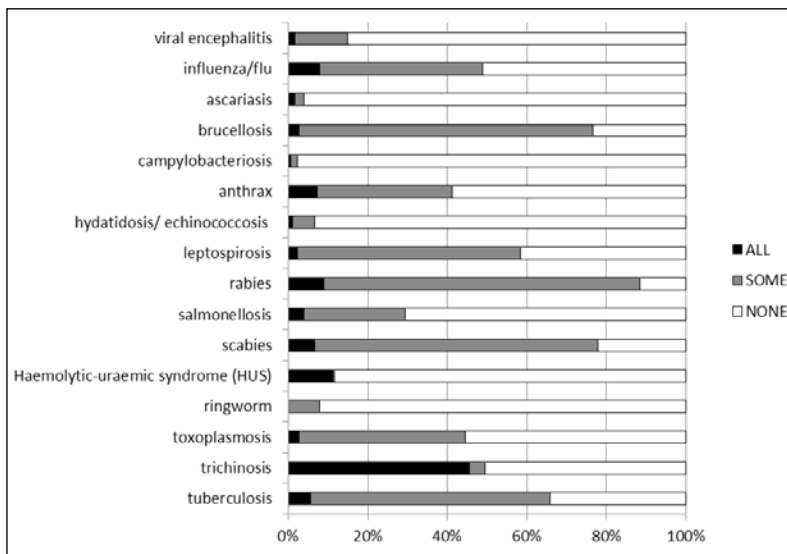


Figure 3: Proportion of respondents (%) who recognized species affected by the zoonoses included in the questionnaire

Discussion

Awareness of zoonoses was associated with a higher level of formal education. The same association was found in other study

(Astesana et al., 2011). In our study, 82% of freshmen knew the meaning of the word zoonoses, a significantly higher figure than previously reported in the general population in Argentina (Castro Hurtado et al, 2003; Tarabla and Fernandez, 2009). Nevertheless, the proportion of respondents who recognized diseases included in the questionnaire as zoonoses was very variable. Highest ranked diseases were rabies, scabies, TB and leptospirosis. This contrasts with the results of a recent survey conducted in 13 Universities in Argentina, where most diagnosed zoonosis in veterinary students were ringworm, brucellosis and toxoplasmosis (Robin et al., 2012). Also in a study made in Colombia, 5 % of veterinary students had been diagnosed positive to leptospirosis and their knowledge about the disease was poor (Cristancho-Torres et al., 2012).

The associations found between demographics characteristics and zoonosis awareness are only observed associations and do not imply causality. Residence and sex may actually mask other variables not included in the study such as high school attended (eg. agro-technical schools), family activity (eg. livestock or dairy farming) or other sensible confounding variables. However, it is interesting to note that although rural residents may be more aware of some zoonoses, the vast majority of entrants come from urban areas.

Being a veterinary student is an important risk factor for zoonotic infections such as leptospirosis (James et al, 2013), rabies (Olugasa et al, 2010), brucellosis (Beheshti et al, 2010), and West Nile fever (Venter et al, 2010). Despite that, awareness of zoonoses on applicants at veterinary schools is scarce. These results reinforce the need for early exposure of veterinary students to issues related to occupational health and biosafety practices.

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