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Knowledge and attitudes about Tetanus and Rabies: A population-based survey from Karachi, Pakistan

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Abstract

Objective: To evaluate public knowledge regarding predisposing factors, fatality and prevention of Tetanus and Rabies and attitudes toward vaccination and post-exposure prophylaxis.

Methods: A population-based, cross-sectional survey was conducted in all the 18 towns of Karachi, the largest metropolitan city of Pakistan, from December 2007 to January 2008. Men and women of more than 18 years of age were included in the study which used a self-reporting questionnaire as its tool.

Results: There were 1201 people interviewed by the study. The majority of respondents had known or heard about Tetanus (n= 973; 81%) and rabies (n= 699; 58%). There were 29 (2.5%) reported dog bites on the subjects themselves and 218(18%) respondents reported dog bites among their family members during the preceding one year. Only three (11%) of these dog bite victims received some kind of vaccine or post-exposure prophylaxis. The majority of the participants were not aware of the fatality of these diseases and the importance of vaccination and post-exposure prophylaxis. Of the total respondents, 563 (47%) reported an injury or wound during the preceding one year. Of them, 426 (76%) received a Tetanus injection. Out of the total study population, 1019 (85%) respondents did not know that Tetanus could be a fatal disease, and 844 (70%) did not know that Tetanus could affect and kill newborns. Literate people and males were more likely to have adequate knowledge on multivariate analysis.

Conclusion: Minor injuries and dog bites are a common occurrence in Karachi. Only a small proportion of these patients received post-exposure treatment. Most of the participants were not aware of the fatality of these diseases and the importance and affordability of vaccination in case of dog bites and minor trauma.

Keywords: Rabies, Tetanus, Vaccines (JPMA 62: 378; 2012).

Introduction

Tetanus and Rabies are common diseases of the developing world. WHO reported 55,000 deaths annually worldwide due to Rabies, with Asia being the largest contributor having a share of 56% of the total deaths.¹ With an estimated human:dog bite ratio of 7.4 in urban areas and 14.3 in rural areas in Asia, around 2.5 billion people are at risk of suffering from Rabies in Asia.² No new Asian country has rid itself of Rabies during the past decade.³ Pakistan has one of the world's highest rates of Rabies — an estimated 2000-5000 human cases per year.⁴ The occurrence of Tetanus is even more than Rabies with the estimated worldwide deaths of 213,000 in 2002, 198,000 of them being children under five years of age, including neonatal Tetanus.⁵ Pakistan is among the nine Asian countries which have failed to control neonatal Tetanus, a major cause of infant mortality in the country.

Some studies in the past have tried to explore the

knowledge and awareness about the two diseases among health professionals, but there is scarcity of data regarding the awareness of these diseases among the masses.^{6,7}

People's perceptions about risk factors, seriousness and fatality of these diseases, importance of vaccination and post-exposure prophylaxis and affordability of vaccination is not well known in our population. As vaccines and post-exposure prophylaxis are both available in Pakistan, the level of public awareness about the preventable and treatable aspect of these diseases and public perceptions and attitudes towards vaccination and post-exposure prophylaxis are important factors in planning for effective interventional strategies.

The objective of the study was to assess people's knowledge about predisposing factors for contracting Tetanus and Rabies, seriousness, especially fatality, related to these diseases, availability and affordability of vaccines and post-exposure prophylaxis. The study also looked at

factors affecting people's knowledge especially age, gender and level of education.

Subjects and Methods

The cross-sectional study was conducted in Karachi, the largest metropolitan city of Pakistan, from December 2007 to January 2008. The study was conducted in 18 towns of Karachi. The study design was approved by the Ethical Review Committee (ERC) of Aga Khan University, Karachi.

The data tool was a self-reporting questionnaire which took about 10 minutes to complete. This was a newly developed tool. The data tool (questionnaire) had three components. The first component covered demographics of the respondents and their sources of information. The second component included questions related to the knowledge and awareness of Tetanus and attitudes toward vaccination and post-exposure prophylaxis. The third component included questions related to the knowledge and awareness of Rabies and attitudes toward vaccination and post-exposure prophylaxis.

The questionnaire was prepared in English and then translated into Urdu (local language). It was then translated back into English for accuracy. It was pilot-tested among 50 individuals before the study was conducted.

Survey teams of volunteer research officers went to areas randomly selected for sampling in each town. Two areas were randomly selected from each town using Google Earth software. A sample of 728 respondents was required (40 participants per town). Population of Karachi is more than 10 million with an adult population of about 7 million. We took each town as a unit. A minimum of 50 forms were filled out from each town to cover dropouts and incomplete data forms. After informed consent, respondents were asked to fill out the form. Data sheet was filled out by the respondent or the team member on behalf of the respondent. Minor injury or wound was defined as any abrasion, cut or injury that would lead to bleeding. Dog bite was defined as bite by a stray dog leading to skin abrasion, teeth marks, laceration or wound. Knowledge was labeled as adequate if respondents rightly answered 50% or more questions related to knowledge testing. Respondents who answered less than 50% knowledge questions correct were labeled as having poor knowledge. Literacy was defined as the ability to read and write.

Data were double-entered into database using Epi info software and checked for errors. After looking at the distribution of the continuous variables, summary statistics were generated by computing means (\pm SD). Frequencies (%) were computed for categorical variables for the characteristics of participating subjects. Knowledge score

was dichotomised as poor knowledge and adequate knowledge. Age was categorised into three groups after doing quartile analysis. To evaluate the association between outcome and other factors, χ^2 -test of independence was carried out.

Odds Ratios (OR) and their 95% Confidence Intervals (CI) were estimated using Logistic Regression, with level of knowledge (good versus poor) as an outcome. In univariable analysis, $p < 0.25$ was used as the level of significance in order not to exclude important variables from the model. Multivariable models were then constructed, including variables that showed an effect in the adequate knowledge in the univariable analysis. All p -values were based on two-sided tests and significance was set at a p -value less than 0.05. The analyses were performed using SPSS (Statistical Package of Social Sciences) Version 16.

Results

There were 1201 people participating in the study, predominantly comprising males (65%). The age range of respondents was 18-86 years with the mean age being 31 ± 13 years. Of the total, 75% respondents were educated

Table-1: Socio-demographic characteristics and sources of information of the respondents.

Variable	n (%) Total n = 1,201
Age, in years	31 \pm 13
Gender	
Male	791 (65.9)
Female	410 (34.1)
Education	
Illiterate	120 (10.0)
Literate	1081 (90.0)
Knowledge status	
Adequate knowledge	120 (10.0)
Poor knowledge	1081 (90.0)
Sources of information	
Friend or family member	675 (56.0)
Radio, TV, Newspaper	199 (17.0)
Physician	103 (9.0)
Do not remember	224 (19.0)

till 10th grade or higher (Table-1).

Out of 1201 respondents, 563 (47%) reported an injury or wound during the preceding one year. Out of these 563 subjects with injuries, 426 (76%) had received a Tetanus injection. More than 80% respondents had known or heard about Tetanus ($n = 973$). Regarding predisposing factors of Tetanus infection, 516 (43%) reported that the organism is located on rusty iron pieces, 310 (26%) reported that it is found in soil, 65(5%) thought it is ingested along with food, and 33(3%) believed that it is an airborne

Table-2: Social factors and knowledge of Tetanus and Rabies; Univariate analysis.

Social factors	Poor knowledge, n=1081	Adequate knowledge, n=120	OR[95% CI]	P- value
Age				
24-33 years	262 (25)	27 (23.1)	0.57[0.236-1.09]	0.19
> 33years	363 (34.7)	33 (28.2)	0.98[0.44-2.05]	0.09
Male	720 (66.6)	71 (59.2)	1.72[0.79-4.11]	0.08
Literate	967 (89.5)	114 (95)	2.54[0.88-6.04]	0.068

Table-3: Multivariate analysis of factors associated with knowledge of Tetanus and Rabies.

Factors	OR[95% CI]	P value
Age more than 33 years	0.95[0.65-1.75]	0.06
Male	2.67[0.89-4.33]	0.04
Literate	3.65[1.06-9.85]	0.02

infection. As many as 1019 (85%) respondents did not know that Tetanus could be a fatal disease, and 844 (70%) did not know that Tetanus could affect and kill newborns. When asked about preventable nature of neonatal Tetanus, 710 (59%) respondents did not know that Tetanus injections during pregnancy could prevent Tetanus in a newborn. After knowing that Tetanus can be fatal and timely diagnosis can prevent it, 1050 (87%) were willing to take Tetanus vaccine and even 926 (77%) were willing to pay for the vaccine.

Reported dog bite numbers were very high among the respondents. There were 29 (2.5%) reported dog bites on the subjects themselves and 218(18%) reported dog bite on one of their family members during the proceeding one year. Only 3(11%) of those dog bite victims had received some kind of vaccine or post-exposure prophylaxis. Majority of respondents had known or heard about Rabies (n= 973; 81%). Out of 1201 respondents, only 533 (45%) knew that dog bite could cause Rabies. Only 193 (16%) knew that Rabies is a fatal disease. When people were asked what they will do in case they suffered a dog bite, 491 (41%) said they would visit District or civil hospital, 287(24%) would visit a local hospital, 317 (26%) would approach a local physician, and 85(7%) would only take home remedies. After knowing that Rabies can be fatal but is also preventable, 1020 (85%) were willing to take Rabies vaccine or post-exposure prophylaxis and 960(80%) were willing to pay for the vaccine or post-exposure prophylaxis.

There was no statistically significant variable found in univariate analysis (Table-2). However, all variables $p < 0.10$ were added in the multivariable analysis. Multiple logistic regression analysis (Table-3) was performed after adjusting for the effect of other variables in the model which further identified that male gender and literacy were associated with adequate knowledge of Tetanus and Rabies. Multivariable models were constructed, including age

variable that showed an effect in the prediction of knowledge in the univariate analyses (age >33 years, $p=0.08$).

Discussion

Minor injuries and dog bites are established predisposing factors for developing Tetanus and Rabies that were common among the study subjects. These findings suggest that a sizable component of population is at risk of developing these diseases. Yet their knowledge and awareness about these diseases is poor. The majority did not know that these diseases could cause death or serious consequences. This lack of awareness was largely responsible for their attitudes towards vaccination and post-exposure prophylaxis. Previous studies suggest high incidence of deaths due to Rabies in our country.⁸ Our study showed that 668 (55%) respondents didn't consider dog bite as a predisposing factor for Rabies and did not know that it can be fatal. These facts are contrary to the figures reported from Sri Lanka, which show 90% awareness about dogs being the main carriers for Rabies, 79% knew that it can be fatal, and 88% reported that it can be prevented by vaccination.⁹ Pakistan has one of the world's highest rates of rabies — an estimated 2000-5000 human cases per year. Pakistanis often resort to local remedies after suffering from a dog bite, such as rubbing red chilies onto the wound. Washing with soap can kill Rabies germs by 65%.⁴ Karachi has only two Rabies management centers that serve people travelling from the interior of Sind and Baluchistan — a vast area covering much of southern Pakistan. These centres record around 20000 dog bites per year. Hence, it is crucial that awareness should be generated to prevent these.⁴

Eighty-five percent respondents (n=1019) did not know that Tetanus could be a fatal disease and 844 (70%) respondents did not know that it could affect and kill newborns. Majority of the people who were interviewed (85%) did not know that tetanus can be fatal, and 76% respondents did not know that it could affect and kill newborns. Pakistan is one of the nine countries that account for about 73% of neonatal Tetanus deaths.¹⁰ This is of particular concern as maternal and neonatal Tetanus (MNT) represents a failure of public health measures in terms of routine vaccinations, antenatal care and clean

delivery/umbilical cord care services. There are extremely wide variations in TT (Tetanus Toxoid) vaccination coverage from district to district in Pakistan even when they are in close proximity.¹⁰

It is imperative to devise various methods and tools to eradicate these preventable deaths. There should be exclusive centres for Tetanus and Rabies at the district or divisional level, and these should act as epicentres for public awareness about the diseases.⁵ To change public perceptions, not only health professionals should be adequately educated about Tetanus and Rabies, but also media has to play its role. Dodet et al. reported that only 2.6% patients from south and southeast Asia reported learning about Rabies from official channels.¹¹ This reflects that there is a strong need to extend and reinforce knowledge and awareness not only about the fatality of these preventable diseases, but also for the post-exposure treatment. Majority of victims infected from Rabies and Tetanus are children. Only 15% schools are educating children about Rabies in Southeast Asia.¹¹ Adult immunisation has been neglected in our country and no known programme by the government or the private sector is currently focussing on either Rabies or Tetanus.

This study documents a higher incidence of injuries in Karachi compared to previous population based studies from Pakistan. Two national surveys i.e. the National Injury Survey of Pakistan and the National Health Survey of Pakistan found an injury rate almost 1/10th the rates of injuries found in this study (41 and 45.9 per 1000 per year respectively).^{12,13} Both studies included only those injuries for which medical care was obtained, thus excluding minor injuries. Injuries occurring in the proceeding two weeks were only included in these studies. We believe that the rates of injuries are higher. Though not entirely responsible for an overestimation, we believe, two factors are responsible for some of the discrepancy, namely, differences in the definition of injury, and the recall bias (our study asked for any injury during the proceeding one year).¹⁴ It is proposed that there should be campaigns launched for providing adequate knowledge about Tetanus and Rabies through media and public messaging service from health-related NGOs and organisations. WHO's role in eradication of these preventable diseases is very crucial and decisive. Though WHO is actively running programmes for Polio and HIV in the region, there is a very strong need to develop routine and supplementary immunisation programme, effective and sustainable surveillance system and more resource and fund allocation to eradicate these diseases. The percentage for children receiving three doses of Diphtheria, Pertussis, and Tetanus vaccine in South Asia is only 58%.¹⁵ Large number of neonatal deaths in Pakistan require an aggressive approach to tackle the disease. Awareness is

directly related to vaccine coverage. Studies have shown that higher knowledge among people or community awareness is associated with increased vaccination coverage.^{16,17} Our study showed 87% and 85% respondents would have themselves vaccinated for Tetanus and Rabies respectively if they were educated about the fatality of the diseases. This has been shown before that handouts given to patients by physicians had increased immunisation rate by three-fold.¹¹ Rabies and Tetanus eradication requires necessary resources for large-scale, long-term vaccination programmes. Each town in Karachi was taken as a unit for sampling and the study did not account for variation of population among the towns. This is a limitation factor in the study.

Conclusion

Minor injuries and dog bites are a common occurrence in Karachi. Only a small proportion of these patients received post-exposure treatment. Most of the participants were not aware of the fatality of these diseases and importance and affordability of vaccination in case of dog bites and minor trauma.

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