http:// ijp.mums.ac.ir
Original Article (Pages: 1977-1982)

Pattern of Pediatric Animal Bites and Post Exposure Prophylaxis in Isfahan Province-Iran, 2015

Salman Khazaei [1], Erfan Ayubi [2], Shahrzad Nematollahi [3], Kamyar Mansori [4], Mahin Ahmadi-Pishkuhi [5], *Abdollah Mohammadian- Hafshejani [6,7], Mahdi Mohammadian[8], Javad Ramazanpour [9], Abbas Rabiei [10], Raheleh Rezaeian-Langroodi[11]

[1]Department of Epidemiology, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran. [2]Department of Epidemiology, School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran. [3]Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran. [4]Department of Epidemiology, Kurdistan University of Medical Sciences, Sanandaj, Iran. [5]School of Public Health, Alborz University of Medical Sciences, Karaj, Iran. [6]Social Determinants in Health Promotion Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran. [7]PhD Candidate, Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran. [8]Social Development & Health Promotion Research Center, Gonabad University of Medical Sciences, Gonabad, Iran. [9]Vice- Chancellor in Health Affairs, Ishahan University of Medical Science, Isfahan, Iran. [10]BSc in Operating Room, Hamadan University of Medical Science, Hamadan, Iran. [11]Department of Nursing, Toyserkan Branch, Islamic Azad University, Toyserkan, Iran.

Abstract

Background: The incidence of animal bite is increasing in Iran and there is lack of knowledge about animal bite in children. Hence, the aim of this study was to describe the characteristics of animal bite in children and also evaluate delayed time of post exposure prophylaxis (PEP) in children.

Materials and Methods: This cross-sectional study was conducted on 172 children cases of animal bites in Isfahan province in 2015. We used registered data from Rabies Treatment Center (RTC) of counties using the census method. Descriptive statistics were used to describe demographic and clinical status of bitten children. The Chi-square test was used to identify factors affecting on delayed time in PEP using Stata 12, software.

Results: Of 172 cases, 66.8% were boy, and 68.0% lived in urban area. The cases were mainly bitten by cats (47.7%), and the most common sites of the animal bite were hands (55.8%). The bite incidents were happened more frequently in spring (32.0%). Overall, 30.8% of the cases received PEP by more than 48 hours after exposure.

Conclusion: The results of this study showed that the pattern of animal bites is different in children compared with adults. More bites caused by cats, especially in the upper limbs. Delay in PEP in children is more common; therefore, it is necessary for parents to be sensitive in this regard.

Key Words: Animal bites, Iran, Pediatrics, Rabies.

*Please cite this article as: Khazaei S , Ayubi E, Nematollahi Sh , Mansori K, Ahmadi-Pishkuhi M, Mohammadian- Hafshejani A, et al. Pattern of pediatric animal bites and post exposure prophylaxis in Isfahan province, 2015.Int J Pediatr 2016; 4(6): 1977-82.

Corresponding Author:

Abdollah Mohammadian- Hafshejani (MSc, PhDc), Department of Epidemiology, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran.

Email: amohamadii1361@gmail.com

Received date Feb23, 2016; Accepted date: Mar 22, 2016

1- INTRODUCTION

Animal bites particularly rabies is a common public health problem which has not been taken into consideration (1). Some of the subsequent infections of animal bites such as rabies are too fatal; so that, the highest fatality rate among infectious diseases is related to rabies (2). This virus affects wild and domestic mammals, and although this disease can be prevented with a vaccine, but it is estimated that 55,000 cases of human deaths have been occurred resulting from rabies around the world annually (3). More than 95% of human deaths resulting from this disease occur in developing countries such as Asia and Africa where disease in population of domestic dogs is endemic (3). According to the report of the World Health Organization (WHO), more than 15 million people are treated for rabies due to animal bites in order to prevent rabies in different parts of the world annually (3). Also around 60,000 cases of human deaths resulting from rabies are reported in worldwide annually (4).

Rabies disease has existed in Iran for a long time; so that, this disease is endemic in our country, and contamination of domestic animals frequently occurs (5). Incidence of animal bites had been increasing in Iran in recent years (6, 7). Dog bites is a common cause of traumatic injury and is a greater source of morbidity and mortality in children than in adults (8). Young children are at risk of serious injury due to animal bites and a higher proportion of them were bitten on the face (8). children under 5 years of age may be at increased risk of bitten as they are more likely to unintentionally provoke a dog to attack (8). Children have the more severe injuries due to inexperience, smaller size and less ability to protect themselves from attacks (9). Although it is suggested that in case of animal biting, earlier treatment and prevention modalities can be effectively administrated and accessible in urban and rural area (10), however some studies indicated of substantial delay for post exposure prophylaxis (PEP) of rabies in Iran (11, 12). It is unclear why there are delay for PEP in Iran, but descriptive analysis can generate hypotheses about the underlying causes of delay for PEP, in other hand wide geographical range, climate diversity, dependence of the major risk factors of rabies on wildlife species and demographic differences makes need for separate investigations in different regions of the country.

In recent years the frequency of animal bite in Isfahan province, Iran in all ages is increasing. The number cases of animal bite during 2011 to 2015 were 7,470, 6,602, 8,507, 8,874 and 9,459 respectively. In 2015 of total cases, 76.1% were lived in urban areas and 81.5% of them were male. Incidence rate for urban areas was 189 and for rural areas were about 300 cases per 100,000 populations. Also, 74.1% of bites were attributed to dogs and less than 10% of them caused by cats. But this pattern can be different in children; therefore present study was conducted in Isfahan province in order to describe the characteristics of animal bite in children and also evaluate delayed time of PEP and associated factors in children.

2- MATERIALS AND METHODS

2-1. Methods

This cross-sectional study was conducted on 172 child cases of animal bites in Isfahan Province from March 2014 to March 2015. Isfahan province is located in the Center of Iran with the area of approximately 107,027 square km. According to the census in the year 2006, the population of the province was 4,559,256 of which approximately 83.3 percent were urban residents. In this study all bitten children under 6 years of old entered in analysis. The animal bitten person is a person who has been bitten by domestic or wild animal. As we know, the

animal bitten person should receive a post-exposure prophylaxis based on the WHO recommendations. Cases of healthy skin licking or contact with animal were not considered as cases of bites. We used the registered information of Rabies Treatment Center (RTC) from counties of Isfahan.

Demographic and clinical information were extracted and entered in a checklist including age, gender, area of residence, reason of bites, season of bits, number of sores, wound status (deep, superficial), bite site (leg, hand, body, head or face), type of biting animal (dog, cat, other), and time of receiving PEP (on time, more than 48 hours). Exclusion criteria were including the subjects who were not the residents of the province.

2-2. Data analysis

Descriptive statistics were used to describe demographic and clinical status of bitten children. Chi-square test was used for data analysis at the 5% significance level to identify relation between delayed time in PEP and time of bites using the statistical software Stata 12 (StataCorp, College Station, TX, USA).

3- RESULTS

Of all the bitten children, 66.8% were boy and 68% were urban. The mean age of children was 3.6± 1.4 year and 35.5% of them had 5 years old. The main cause of animal bite was irritated of animal by 36.6% of cases (**Table.1**).

The distribution of clinical characteristics of bitten children is shown in (**Table.2**). In 60.4% of cases animal bites were resulting in one wound. Hand with 55.8% of the bites was the most major part. 21.5% of cases had deep injuries and 78.5% had superficial injuries. The cat and domestic dogs were involved in 47.7% and 38.3% of exposures respectively.

According (**Table.3**), 32% of cases involved in spring season and more than 50% of them occurred between 12 and 18 hours. Regarding the relation between time of bites and time of post exposure prophylaxis there was significant association between season and delay for PEP (P= 0.016) as well as with time of bites (P=0.001).

Table 1: Demographic characteristics of bitten children in Isfahan province, 2015

Variables		Number	Percent
Gender	Boy	115	66.8
	Girl	57	33.2
Residency	Urban	117	68
	village	55	32
Age groups (Year)	<1	7	4.1
	1	5	2.9
	2	26	15.1
	3	27	15.7
	4	46	26.7
	5	61	35.5
Reason of bites	Animal sudden attack	55	32
	Play with animal	42	24.4
	Feeding animal	12	7
	Irritate of animal	63	36.6

Table 2: Clinical characteristics of bitten children in Isfahan province, 2015

Variables		Number	Percent
Number of sores	1	104	60.4
	2	31	18
	3	19	11
	>3	18	11
Bite site	Leg	43	25
	Hand	96	55.8
	Body	19	11
	Head & Face	16	9.2
Wound status	Deep	37	21.5
	Superficial	135	78.5
Type of biting animal	Domestic Dog	62	35.4
	Stray Dog	5	2.9
	Cat	82	47.7
	Monkey	6	3.4
	Rabbit	4	2.3
	Other	13	7.6

Table 3: Relation between time of bites and time of post exposure prophylaxis

Variables		Frequency (%)	Post exposure prophylaxis time		P-value
			On time	Delay (more than 48 hr)	
Season	Spring	55 (32.0)	45 (81.8)	10 (18.2)	0.016
	Summer	43 (25.0)	30 (69.8)	13 (30.2)	
	Autumn	38 (22.1)	26 (68.4)	12 (31.6)	
	Winter	36(20.1)	18 (50.0)	18 (50.0)	
Time of bite (hour)	0-6	4 (2.3)	1 (25.0)	3 (75.0)	0.001
	6-12	47 (27.3)	30 (63.8)	17 (36.2)	
	12-18	88 (51.2)	57 (64.8)	31 (35.2)	
	18-24	33(19.2)	31 (93.9)	2 (6.1)	
Total		172	119 (69.2)	50 (30.8)	

4- DISCUSSION

The aim of the study was to describe the characteristics of animal bite in children and also evaluate delayed time of PEP and associated factors in children. Results of this study showed that animal bite is more common among boys and urban areas of Isfahan.

About half of injuries attributed to cats and irritate of animal was the main cause of animal bite. Also, about 30% of children had delay for PEP. About 70% of bitten children in this study were boys, which this result is consistent with previous studies in Iran (11-13) and other countries (13, 14). The reason of higher occurrence of animal bites in boys probably is they spend more time outdoors than girls. Most of the victims (69%) lived in urban, inconsistent finding with other studies where most cases of animal bites occurred in rural areas (11, 12, 15). Also, in the present study, 47.7% of our cases were victims of cat bites. This finding is inconsistent with others study which most animal bites were from dogs (7, 11, 16).

According to the census in the year 2006 in Isfahan province, approximately 83.3 percent were urban residents and 16.7 percent resided in the rural areas. Therefore this difference between the rural and urban populations could explain this

discrepancy. In line of previous studies (14, 17), highest cases occurred in children aged over 2 years. In this study, more bite incidents were in spring (32%) followed in summer (25%) with no significant differences between delay in PEP and seasons. Other previous studies have also reported the higher proportion of animal bites in spring and summer (11, 17, 18). This finding may be due to increase in travelling people in rural and agricultural areas as well as school closures and also increased activity of animals seeking foods. Delay of PEP in winter maybe attributed Bad weather conditions.

Considering anatomic location of the bites, the majority of cases were related to hands (58.2%), this result is inconsistent with other studies were conducted on all ages which most common bitten part of the body was legs (6, 7, 11, 18); this difference was due the difference in the anatomic status of children as well as their small size. Generally delay in PEP in this study is more common in compered in other studies conducted on total population (11, 12). One reason may be due to the shallow depth of wounds in children or diminish the importance of cat bite by parents.

4-1. Limitations of the study

One of the limitations of this study, due to we used registered data, therefore we were unable to collect some other variables such as socio-economic status, education level of parents and other variables related with animal bite in children. However, our study is a limited study that was conducted in Iran about animal bite in children.

5. CONCLUSION

The results of this study showed that the pattern of animal bites is different in children compared with adults. More bites caused by cats, especially in the upper limbs. Delay in PEP in children is more common; therefore, it is necessary for parents to be sensitive in this regard. Also Health-care providers should be educated on the appropriate management of animal bites and health policy-makers should ensure rabies control within animal populations, and appropriate supplies of post-exposure rabies treatment and antibiotic prophylaxis for bitten people. They should also provide enough education for this age group.

6- CONFLICT OF INTEREST

The authors had not any financial or personal relationships with other people or organizations during the study. So there was no conflict of interests in this article.

7- ACKNOWLEDGMENT

The authors would like to thanks of personnel of the Rabies Treatment Center in Isfahan province to providing the data for this work.

8- REFERENCES

1. Fevre EM, Kaboyo RW, Persson V, Edelsten M, Coleman PG, Cleaveland S. The epidemiology of animal bite injuries in Uganda and projections of the burden of rabies. Trop Med Int Health 2005;10(8):790–8.

2. Willoughby RE Jr, Tieves KS, Hoffman GM. Survival after treatment of rabies with induction of coma. N Engl J Med 2005; 352: 2508-14.

3. World Health Organization. Rabies. Geneva: WHO; 2013 [updated 2013; cited 2016]; Available at: http://www.who.int/mediacentre/factsheets/fs099/en/.

4. World Health Organization. Human rabies. Geneva: WHO; 2016 [updated 2016; cited 2016]; Available at: http://www.who.int/rabies/human/en/.

5. Nadin-Davis SA, Simani S, Armstrong J, Fayaz A, Wandeler AI. Molecular and antigenic characterization of rabies viruses from Iran identifies variants with distinct epidemiological origins. Epidemiology and infection 2003;131(1):777-90.

6. Kassiri H, Kassiri A, Lotfi M, Shahkarami B, Hosseini S-S. Animal bite

7. Sabouri Ghannad M, Roshanaei G, Rostampour F, Fallahi A. An epidemiologic study of animal bites in Ilam Province, Iran. Arch Iran Med 2012;15(6):356-60.

8. Akhtar N, Smith M, McKirdy S, Page R. Surgical delay in the management of dog bite injuries in children, does it increase the risk of infection? Journal of Plastic, Reconstructive & Aesthetic Surgery 2006;59(1):80-5.

9. Sriaroon C, Sriaroon P, Daviratanasilpa S, Khawplod P, Wilde H. Retrospective: animal attacks and rabies exposures in Thai children. Travel medicine and infectious disease 2006;4(5):270-74.

10. Park JH, Lee CH, Won YK, Chin BS, Shin HS, Kim JY. Rabies post-exposure prophylaxis of overseas travelers in the international travel clinic of the national medical center from 2006 to 2012, Korea. Infection & chemotherapy 2014;46(1):13-20.

11. Khazaei S, Rezaeian S, Salehiniya H, Rezaei R, Sabzavari JTN, Soheilyzad M. Delay in Post-Exposure Prophylaxis and Associated Factors Among People Bitten by Animals in the Northeast of Iran, 2015. Archives of Clinical Infectious Diseases. 2016 (In-press).

12. Khazaei S, Rezaeian S, Soheylizad M, Gholamaliee B. Factors associated with delay in post-exposure prophylaxis in bitten people. Medical Journal of the Islamic Republic of Iran 2014;28:158.

incidence in the County of Shush, Iran. Journal of Acute Disease 2014;3(1):26-30.

13. Kaye AE, Belz JM, Kirschner RE. Pediatric dog bite injuries: a 5-year review of the experience at the Children's Hospital of Philadelphia. Plastic and reconstructive surgery 2009;124(2):551-8.

14. Muyila DI, Aloni MN, Lose-Ekanga MJ, Nzita JM, Kalala-Mbikay A, Bongo HL, et al. Human rabies: a descriptive observation of 21 children in Kinshasa, the Democratic Republic of Congo. Pathogens and global health 2014;108(7):317-22.

15. Ghaffari-Fam S, Hosseini SR, Daemi A, Heydari H, Malekzade R, Ayubi E, et al. Epidemiological patterns of animal bites in the Babol County, North of Iran. Journal of Acute Disease 2016;5(2):126-30.

16. Poorolajal J, Babaee I, Yoosefi R, Farnoosh F. Animal Bite and Deficiencies in Rabies Post-Exposure Prophylaxis in Tehran, Iran. Arch Iran Med 2015;18(12):822-6.

17. Ichhpujani R, Mala C, Veena M, Singh J, Bhardwaj M, Bhattacharya D, et al. Epidemiology of animal bites and rabies cases in India. A multicentric study. The Journal of communicable diseases 2008;40(1):27-36.

18. Tenzin, Dhand NK, Gyeltshen T, Firestone S, Zangmo C, Dema C, et al. Dog bites in humans and estimating human rabies mortality in rabies endemic areas of Bhutan. PLoS Negl Trop Dis 2011;5(11):e1391.