EPIDEMIOLOGICAL STUDY OF ANIMAL ACCIDENTS AND HUMAN ANTIRABIC PROPHYLAX IN ITAPORANGA, PARAÍBA, BRAZIL

ESTUDO EPIDEMIOLÓGICO DE ACIDENTES COM ANIMAIS E PROFILAXIA ANTIRRÁBICA HUMANA EM ITAPORANGA, PARAÍBA, BRASIL

ESTUDIO EPIDEMIOLÓGICO DE ACCIDENTES CON ANIMALES Y PROFILAXIS ANTIRRÁBICA HUMANA EN ITAPORANGA, PARAÍBA, BRASIL

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ABSTRACT:

Objective: To evaluate the profile of injuries and the conduct of post-exposure human rabies prophylactic care between 2014 and 2017 in Itaporanga-PB. Methods: Records of rabies prophylactic care from the Notifiable Diseases Information System (SINAN) were evaluated. Demographic and clinical variables of the injuries were analyzed, as well as whether the type of prophylactic conduct adopted was in accordance with the current Ministry of Health protocol. Results: Among the 245 injuries analyzed, the epidemiological profile revealed that the majority of cases involved men (57.6%), aged between 20 and 59 years, residing in urban areas. Injuries were observed to be 1.8 times more frequent among men with low education, with bites being the most common type of injury and dogs the main culprits. This type of animal showed an increased risk of incidents with men, while cats presented a higher risk of incidents with women. Of the total cases, 61.1% were treated with animal observation and vaccination, 78% of the conduct was considered adequate, 14.7% received unnecessary vaccine doses, and in 7.3% the immunization was insufficient. Final considerations: Improvements are needed in the processes of injury assessment, follow-up, and reporting, through the complete filling out of notification forms.

KEYWORDS: Rabies; Epidemiological Profile; Vaccination; Rabies Virus; Post-Exposure Prophylaxis.

RESUMO:

Objetivo: Avaliar o perfil das lesões e a conduta da profilaxia antirrábica humana pós-exposição entre 2014 e 2017 em Itaporanga-PB. Métodos: Foram avaliados os registros de profilaxia antirrábica do Sistema de Informação de Agravos de Notificação (SINAN). Foram analisadas as variáveis demográficas e clínicas das lesões, bem como se o tipo de conduta profilática adotada estava de acordo com o protocolo atual do Ministério da Saúde. Resultados: Entre as 245 lesões analisadas, o perfil epidemiológico revelou que a maioria dos casos envolveu homens (57,6%), com idade entre 20 e 59 anos, residentes em áreas urbanas. Observou-se que as lesões eram 1,8 vezes mais frequentes entre homens com baixa escolaridade, sendo as mordeduras o tipo de lesão mais comum e os cães os principais responsáveis. Esse tipo de animal mostrou um risco aumentado de incidentes com homens, enquanto os gatos apresentaram um risco maior de incidentes com mulheres. Do total de casos, 61,1% foram tratados com observação do animal e vacinação, 78% das condutas foram consideradas adequadas, 14,7% receberam doses de vacina desnecessárias e em 7,3% a imunização foi insuficiente. Considerações finais: São necessárias melhorias nos processos de avaliação das lesões, acompanhamento e notificação, através do preenchimento completo dos formulários de notificação.

PALAVRAS-CHAVE: *Raiva; Perfil Epidemiológico; Vacinação; Vírus da Raiva; Profilaxia Pós-Exposição.*

RESUMEN

Objetivo: Evaluar el perfil de las lesiones y la conducta de la profilaxis antirrábica humana post-exposición entre 2014 y 2017 en Itaporanga-PB. Métodos: Se evaluaron los registros de profilaxis antirrábica del Sistema de Información de Enfermedades de Notificación (SINAN). Se analizaron las variables demográficas y clínicas de las lesiones, así como si el tipo de conducta profiláctica adoptada estaba de acuerdo con el protocolo actual del Ministerio de Salud. Resultados: Entre las 245 lesiones analizadas, el perfil epidemiológico reveló que la mayoría de los casos involucraron a hombres (57,6%), con edades entre 20 y 59 años, residentes en áreas urbanas. Se observó que las lesiones eran 1,8 veces más frecuentes entre hombres con baja escolaridad, siendo las mordeduras el tipo de lesión más común y los perros los principales responsables. Este tipo de animal mostró un riesgo aumentado de incidentes con hombres, mientras que los gatos presentaron un mayor riesgo de incidentes con mujeres. Del total de casos, el 61,1% fueron tratados con observación del animal y vacunación, el 78% de las conductas fueron consideradas adecuadas, el 14,7% recibió dosis de vacuna innecesarias y en el 7,3% la inmunización fue insuficiente. Consideraciones finales: Se necesitan mejoras en los procesos de evaluación de las lesiones, seguimiento y notificación, a través del llenado completo de los formularios de notificación.

Palabras clave: *Rabia; Perfil Epidemiológico; Vacunación; Virus de la Rabia; Profilaxis Postexposición.*

INTRODUCTION

Rabies, a zoonosis caused by a virus belonging to the *Lyssavirus* genus, is a disease that affects the central nervous system, leading to the development of acute and fatal encephalomyelitis. This viral disease is transmitted to humans through the saliva and secretions of infected animals via bites, licks, and scratches, with percutaneous transmission being the most common route. However, transmission can also occur through aerosol inhalation, zoophilia, human-to-human contact, and corneal transplantation (Bilal, 2021; Rupprecht *et al*., 2022; Acharya *et al*., 2022).

In this context, the infection primarily affects poor and vulnerable populations in rural areas, where it is considered one of the most neglected tropical diseases. Although a reduction in the number of cases has been observed in recent years, its high mortality and the costs associated with control and prophylaxis make rabies a constant challenge (Alves; Andrade Júnior; Barbosa, 2019; Acharya *et al*., 2022).

All mammals can become infected with this virus, but the most significant public health reservoirs are found in the order Chiroptera, which includes hematophagous, frugivorous, and insectivorous bats, and the order Carnivora, especially dogs, foxes, raccoons, opossums, and mongooses (Alves;Andrade Júnior;Barbosa, 2019; Naveed *et al*., 2024). In the Americas, dogs, foxes, and bats play a significant role in the transmission of this pathogen (Naveed *et al*., 2024).

Rabies infection is fatal without appropriate post-exposure prophylaxis. Therefore, vaccination is used for active immunization and serotherapy for passive immunization against the virus (Acharya *et al*., 2022). The vaccine treatment can be administered with or without concurrent serum administration, following incidents with potentially transmissible animals. Worldwide, over 15 million people receive post-exposure prophylaxis every year (Naveed *et al*., 2024). Unfortunately, in Brazil, despite the high number of post-exposure prophylaxis treatments, there is also a significant prevalence of abandonment and inadequate treatment (Estima *et al*., 2022).

The rabies vaccine available throughout the public health network in Brazil is currently produced in cell culture and is considered safe and effective (Brasil, 2009). The prophylactic schemes adopted follow technical guidelines set by the Ministry of Health, which vary based on the type of exposure, the clinical condition of the animal, the possibility of observing the animal, the existence of pre-exposure prophylaxis for the injured person, and other parameters (Brasil, 2014; Brasil, 2017).

In this context, animal exposures in Brazil are recorded in the Notification Information System (SINAN), which aims to document data on each compulsory notification disease occurring in the country. For this purpose, a set of standardized forms is used, including the human rabies treatment form (Brasil, 2009).

Due to the implementation of the National Rabies Prophylaxis Program (PNPR) in 1973, a reduction in the number of rabies cases in Brazil was observed. However, during an eleven-year period from 2010 to 2021, 40 cases of the disease were still reported in humans (Silva *et al*., 2022; Brasil, 2017; Brasil, 2024).

Due to the scarcity of local studies analyzing the epidemiology of rabies and the prophylactic measures adopted, this study assessed the epidemiology of exposures and human rabies prophylaxis adopted from 2014 to 2017 in the municipality of Itaporanga, Paraíba (PB), Brazil.

METHODOLOGY

Study Type

An epidemiological, descriptive, and analytical study was conducted to evaluate the profile of human rabies exposures caused by animals and the rabies prophylactic measures adopted in the city of Itaporanga, Paraíba, Brazil, between 2014 and 2017. Secondary data were used, collected from individual rabies treatment notification forms stored at the Municipal Health Department (SMS) and SINAN, for the resident population of Itaporanga-PB.

Study Area

Itaporanga (07° 18' 16" S and 38° 09' 01" W) is located in the Sertão Paraibano mesoregion. It has a territorial area of 460.210 km², a density of 52.02 inhabitants/km² in 2022, and an HDI of 0.615 in 2010. The altitude is 289 meters, with a distance of 429.2 km from the capital, João Pessoa. According to the 2022 census by the Brazilian Institute of Geography and Statistics (IBGE), the population was 23,940. The city is situated in the caatinga biome and has a semi-arid climate (IBGE, 2024).

Data Collection

The prevalence of exposures was analyzed by year, age, sex, education level, and place of residence. Clinical variables analyzed included: a) type of exposure (direct contact, scratching, licking, biting, and others); b) site of exposure (mucous membranes, head, hands, feet, trunk, upper limbs, and lower limbs); c) type of wound (superficial, deep, or lacerating).

The characteristics of the animal analyzed were: species, initial and final condition of the animal (after ten days), and whether it was possible to observe the animal.The types of prophylactic measures analyzed were: a) no treatment; b) observation of the animal; c) observation plus vaccine; d) vaccine; e) serum + vaccine; as well as the use and adequacy of serotherapy according to the characteristics of the injury and any adverse effects.

A prophylactic measure was considered adequate if it followed the current Ministry of Health protocol (Brasil, 2014; Brasil, 2017) and inadequate if the patients received unnecessary vaccine doses or had insufficient immunization. The continuity of the prescribed treatment and the reason for interruption, if any (indication by the health unit, abandonment, or transfer), were analyzed.

Statistical Analysis

Associations between variables were evaluated using the Chi-square test, and adjusted residuals were analyzed. Prevalence Ratios (PR) with their respective confidence intervals were calculated as a measure of association to estimate the magnitude between the data. A p-value <0.05 was considered statistically significant. Data were analyzed using the Statistical Package for Social Sciences (SPSS), version 13.0 for Windows.

Ethical Considerations

The research was conducted following the guidelines and regulatory standards for research involving human subjects, Resolution No. 466, December 12, 2012. Additionally, it was approved by the Research Ethics Committee of the Alcides Carneiro University Hospital (HUAC) – UFCG, CAAE 86752917.0.0000.5182, opinion No. 2,670,516.

RESULTS AND DISCUSSION

A total of 245 human rabies treatment records were analyzed from 2014 to 2017 in the municipality of Itaporanga-PB and surrounding areas. The highest occurrence of exposures was observed in 2014 and 2015, with 39.2% and 38.8%, respectively, followed by a decrease in 2016 (12.2%) and 2017 (9.8%). During this period, there was an average of 5 exposures per month. Residents of Itaporanga-PB were responsible for 218 (89%) of the exposures, followed by residents of neighboring municipalities: Pedra Branca-PB (3.3%), Diamante-PB (2.9%), Boa Ventura-PB (2.0%), São José do Caiana-PB (1.6%), Santana dos Garrotes-PB (0.8%), and Serra Grande-PB (0.4%).

Considering that the population of Itaporanga-PB during the study period was 24,674 inhabitants, the average prevalence rate for the studied period was 2.2 cases per 1,000 inhabitants. Of the 245 individuals exposed, 57.6% were men, and 44.9% were adults, followed by children (20.8%). Additionally, there was no statistical significance between gender and age (p=0.373) (Table 1).

Regarding education, only 92 individuals had this information recorded, with an association found between gender and education level (p=0.013), showing a predominance of accidents among individuals with low education levels (84.5% and 62.5% for males and females, respectively), which includes those with no education or incomplete or completed elementary education.

Using the Prevalence Ratio (PR) as a measure of association, it was observed that men with low education had 1.8 times higher accident frequency. Table 1 shows the association between the mentioned variables.

Table 1 – Distribution of Human Rabies Treatments in Itaporanga, Paraíba, Brazil, from 2014 to 2017, by Gender, Age, and Education Level.

Category	Gender				p-value	PR (CI)
	Male		Female			
Age group	n	%	n	%		
0-10 years	31	22.0	20	19.2	0.373	-
11-19 years	26	18.4	12	11.6		

20-59 years	58	41.2	52	50.0	
≥ 60 years	26	18.4	20	19.2	
Education level					
Low*	49	84.5+	25	62.5	0.013	1.766
Medium/High**	9	15.5	15	37.5		(1.82-3.03)

*Low education: illiterate, incomplete and complete elementary education; **Medium/High education: incomplete and complete secondary education; and incomplete and complete higher education; Positive association - Chi-square test.*

The distribution of cases by residence zone revealed that individuals from the urban area were more affected (74.7%).

Regarding the type of exposure, bites were more prevalent in both males (90.1%) and females (83.7%). Concerning the location, it was observed that males had a higher frequency of injuries to the hands/feet (45.4%), while females had a higher frequency of injuries to the lower limbs (37.5%). For the type of wound, multiple injuries were more prevalent in both sexes, with 58.2% in males and 55.8% in females. In terms of wound type, deep wounds were more frequent in males (52.5%) and superficial wounds in females (52.9%). Table 2 shows that there was no statistically significant association between the mentioned variables.

Table 2 – Distribution of human rabies post-exposure treatments, occurring in Itaporanga, Paraíba, Brazil, between 2014 and 2017, by sex, type of exposure, location, type of wound, and aggressor animal.

Categories	Gender				p-value
	Malo		Female		
Type of exposure	N	%	n	%	
Licking	0	0	1	1	
Scratching	14	9.9	16	15.4	*
Biting	127	90.1	87	83.7	
Location					
Mucosa	1	0.7	2	1.9	
Head/Neck	5	3.5	6	5.8	
Hands/Feet	64	45.4	37	35.6	
Trunk	9	6.4	1	1	*

Upper Limbs	21	14.9	19	18.3	
Lower Limbs	41	29.1	39	37.5	
Wound					
Single	59	41.8	46	44.2	0.709
Multiple	82	58.2	58	55.8	
Type of Wound					
Deep	74	52.5	45	43.3	0.358
Superficial	62	44	55	52.9	
Lacerated	5	3.5	4	3.8	

*Chi-square test not applicable.

When analyzing the prevalence of different anatomical regions affected by age groups, it was observed that in children (0-10 years), 45.5% of the injuries were to the head/neck. Additionally, 60% of the trunk injuries also occurred in children. In adolescents, adults, and the elderly, injuries to the hands and feet were more prevalent.

Regarding the species of animals involved in the 245 notifications, dogs were the most common (78%), followed by cats (21.2%). Accidents involving wild animals such as primates (0.4%) and foxes (0.4%) were also recorded (Table 3).

When associating the 243 notifications of dogs and cats with sex, it was found that cats caused more incidents in females (57.7%) and dogs in males (61.8%). Furthermore, there was a significant statistical association between sex and the species of the involved animal. It was found that accidents caused by dogs occurred 1.5 times more frequently in males and accidents caused by cats occurred 1.5 times more frequently in females (Table 3).

Table 3 - Distribution of human rabies treatments occurring in Itaporanga, Paraíba, Brazil, between 2014 and 2017, by sex and species of the involved animal.

Category	Gender				p-value	PR (CI)
	Male		Female			
Species	N	%	n	%		
Dog*	118	83.7	73	70.2	0.012	1.460 (1.04 – 2.04)
Cat**	22	15.6	30	28.8	0.012	1.505 (1.12 – 2.01)

Fox	0	0	1	1.0	-	-
Primate	1	0.7	0	0	-	-

*PR (CI) dog x male,**PR (CI) cats x female.

Table 4 shows the percentages of anatomical locations affected in accidents by age group.

Table 4 - Distribution of human rabies treatments occurring in Itaporanga, Paraíba, Brazil, between 2014 and 2017, according to anatomical location and age group.

Categories	Age									
	0-10		11-19		20-59		≥ 60		Total	
Location	n	%	n	%	n	%	n	%	n	%
Mucosa	0	0	0	0	2	1.8	1	2.2	3	1.2
Head/Neck	5	45.5	4	10.5	2	1.8	0	0	11	4.5
Hands/Feet	16	31.4	13	34.2	48	43.6	24	52.2	101	41.2
Trunk	6	11.8	2	5.3	1	0.9	1	2.2	10	4.1
Upper Limbs	9	17.6	8	21.1	21	19.1	2	4.3	40	16.3
Lower Limbs	15	29.4	11	28.9	36	32.7	18	39.1	80	32.7

Regarding the severity of the accidents, it was observed that 69.8% of individuals experienced severe accidents and 30.2% experienced mild accidents. It was found that 58.5% of the 171 severe accidents and 55.4% of the mild accidents (n=74) occurred in males; 45.6% of the severe accidents occurred in the 20-59 age group, 19.9% in those over 60 years old, 19.3% in the 0-10 age group, and 15.2% in the 11-19 age group. Mild accidents were more common in the 20-59 age group, followed by 24.3% in the 0-10 age group, 16.2% in the 11-19 age group, and 6.2% in those over 60 years old. Regarding animal species, dogs were the most involved, both in severe accidents (78.9%) and in mild accidents (75.7%). Cats were responsible for 19.9% of the severe accidents and 24.3% of the mild accidents. Primates were responsible for 0.6% of the severe accidents and foxes for 0.6%. There was no statistically significant association between the type of accident (mild and severe) and the variables of sex (p=0.655) and age group (p=0.778).

It was observed that biting was the most frequent type of exposure caused by both dogs (88.5%) and cats (82.7%). In terms of anatomical location, hands/feet were the most affected areas by both dogs (41.4%) and cats (40.0%). 55% of accidents involving dogs and 65.4% involving cats resulted in multiple wounds. 49.2% of wounds caused by dogs were deep, while 51.9% of wounds caused by cats were superficial (Table 5). No statistically significant association was found between the variables.

Table 5 – Distribution of human rabies treatments occurring in Itaporanga, Paraíba, Brazil, between 2014 and 2017, according to the species of the involved animal by type of exposure, location, wound, and type of wound.

Category	Animal Involved				p-value
	Dog		Cat		
Type of exposure	N	%	n	%	
Licking	1	0.5	0	0	*
Scratching	21	11	9	17.3	
Biting	169	88.5	43	82.7	
Location					
Mucosa	1	0.5	2	3.8	*
Head/Neck	9	4.7	2	3.8	
Hands/Feet	79	41.4	21	40.4	
Trunk	10	5.2	0	0	
Upper Limbs	30	15.7	10	19.2	
Lower Limbs	62	32.5	17	32.7	
Wound					
Single	86	45	18	43.6	0.179
Multiple	105	55	34	65.4	
Type of Wound					
Deep	94	49.2	24	46.2	0.722
Superficial	90	47.1	27	51.9	
Lacerated	7	3.7	1	1.9	

*No Chi-square test applicability.

Regarding the clinical condition of the animals involved, of the 191 incidents involving dogs and 52 involving cats, 49.7% and 36.5% were healthy at the time of the

attack, respectively. 47.1% of the dogs and 55.8% of the cats were suspected of having rabies. The study noted one rabid animal (a cat), but this condition was only clinically observed, as there were no laboratory results available in the notification form. 3.1% of the dogs and 5.8% of the cats were considered dead or missing. Among the animals involved in the incidents, 74.3% of the dogs and 78.8% of the cats were available for observation.

Of the 245 prophylactic measures indicated, 61.6% involved observation+vaccination, followed by serum+vaccination (35.5%), vaccination alone (2.4%), and observation of the animal (0.4%).

When analyzing the prophylactic measures for the 245 incidents, it was observed that 78% were adequate (following the protocol), 14.7% of the patients received unnecessary vaccine doses (more than required), and in 7.3% of cases, the immunization was insufficient (fewer doses than required).

Data such as the final condition of the animal, whether treatment was interrupted, the reason for interruption, whether there was treatment abandonment, vaccine adverse events, patient weight, amount of serum administered, serum infiltration at the injury sites, the laboratory producing the rabies serum, and adverse events related to the rabies serum, were not filled out or recorded in any notification forms of the human rabies treatment at the SMS.

In the city of Itaporanga, Paraíba, Brazil, an average prevalence rate of 2.2 cases per 1,000 inhabitants was observed, reflecting significant concern related to the control of human and animal rabies in the region. This rate may suggest the need for more effective strategies for controlling animals and awareness campaigns. Additionally, it is essential to monitor and investigate the causes of these incidents to reduce their incidence.

It was observed that the prevalence of animal bites is higher among males and adults, followed by children. The higher prevalence among adults may be attributed to the fact that they generally have more frequent contact with animals. Major causes of these accidents include improper handling, deficiencies in animal socialization, excessive punishment, and lack of boundaries and training, especially in dogs with guarding and territorial instincts. For children, a lack of knowledge about animal

behavior may lead to provocative or defensive reactions from animals, resulting in incidents (Barbosa; Pequeno, 2020).

Regarding the years of study, a higher percentage of accidents was observed among males with low education, with statistical significance ($p = 0.013$). It is presumed that the level of education may be closely related to the socioeconomic level and development of the region, which could influence greater human-animal contact, lower knowledge about sanitary care and proper handling, and the maintenance of wild animals in captivity, consequently increasing the risk of animal-related accidents (Azevedo et al., 2018; Gheno et al., 2023).

In terms of geographic origin, it was observed that most individuals were from the urban area, similar to findings in Caçapava do Sul-RS (Lopes et al., 2014) and Teresina-PI (Abreu; Crizóstomo, 2014). This can be explained by the higher population density and the presence of stray and semi-domesticated animals in urban environments, although the origin of the animal involved in the incident was not recorded in the notification forms.

Bites were the most prevalent type of accident in Itaporanga-PB, similar to studies conducted in Caçapava do Sul-RS (Lopes et al., 2014), Cruzeiro do Sul-AC (Negreiros et al., 2018), and Cuité-PB (Azevedo et al., 2018). The most affected anatomical regions were the lower limbs in females and hands and feet in males. This corroborates research conducted in Teresina-PI (Abreu; Crizóstomo, 2014) and Cruzeiro do Sul-AC (Negreiros et al., 2018). Regarding the number and type of injuries, a higher prevalence of multiple and deep wounds was observed in males and superficial wounds in females. In Porto Alegre-RS, a single type of deep wound was the most prevalent in both sexes (Veloso et al., 2011). This same profile was also found in Teresina-PI (Abreu; Crizóstomo, 2014).

Regarding the anatomical region and age group, injuries to the head/neck and trunk were prevalent among children. The high prevalence of wounds in these areas may be related to their low stature and lack of defense and escape capabilities (Barbosa; Pequeno, 2020). Injuries in these areas are considered severe due to the rabies virus's tropism for the nervous system (Feige et al., 2021). The higher occurrence of injuries to hands/feet in adolescents, adults, and the elderly may be related to attempts at defense and fighting or touching food or removing objects from the animal's possession (Azevedo et al., 2018).

Accidents involving canines were the most frequent, as also observed in Caçapava do Sul-RS (Lopes et al., 2014) and São Luís-MA (Araújo et al., 2014). Reports of aggression by foxes and primates in Itaporanga were also recorded in the Paraíba cities of Cuité (Azevedo et al., 2018) and Barra de Santa Rosa (Barbosa; Pequeno, 2020). These incidents involving wild species are significant since these animals act as reservoirs for the virus's sylvatic cycle. In the northeastern semi-arid region, the most involved wild animal in human attacks has been the fox, as many are kept as pets in close association with humans (Araújo et al., 2014; Cabral et al., 2018).

A statistical correlation was observed between the animal species involved and gender, with dog bites predominating in males and cat bites in females. The same association was observed in Porto Alegre-RS, where dog attacks were 1.06 times more frequent in males, while cat attacks were 1.06 times more frequent in females ($p = 0.000$; PR = 1.06) (Veloso et al., 2011) and in Cuité-PB, where the occurrence was 1.587 for dogs in men and 1.415 for cats in women ($p = 0.019$) (Azevedo et al., 2018). It is assumed that males have a higher risk of dog bites due to greater contact with animals, spending more time outside, and engaging in behaviors that may stimulate aggression (Veloso et al., 2011).

Regarding the type of accident, severe cases predominated, especially among males and adults. This data suggests that the population seeks treatment more for this type of injury but may not be aware that other types of contact with animals can also contribute to the transmission of rabies.

Regarding the types of exposures, dogs and cats primarily caused bites, similar to a study conducted in Belo Horizonte-MG (Cabral et al., 2018). It is worth noting that felines generally use their claws during attacks, penetrating deep tissues such as the joints of hands and arms. It is important to highlight that scratches present a high risk of rabies infection since felines constantly lick themselves, which can introduce the pathogen from saliva present in the claws (Araújo, 2017).

Regarding the extent of the injury, a higher prevalence of multiple injuries was observed, both caused by dogs and cats. Multiple injuries present a higher risk of rabies exposure because they cover a larger area, consequently increasing the entry point for infection (Araújo, 2017).

Regarding the type of wound, a higher prevalence of deep wounds was observed caused by dogs and superficial wounds caused by cats. On the other hand, in Belo Horizonte-MG, most dog-related injuries were superficial (Cabral et al., 2018) and in Maringá-PR, as in the present study, a higher prevalence of superficial injuries was observed with felines (Correa et al., 2014). It is important to note that bites are associated with deep injuries and are primarily caused by dogs, while scratches are associated with superficial injuries caused by felines (Grisolio, 2014).

In Itaporanga-PB, a high percentage of individuals received some form of prophylactic treatment with immunobiologics (99.6%). The most commonly adopted prophylactic scheme was observation combined with vaccination in 61.6% of notifications, similar to findings in Cuité-PB (Azevedo et al., 2018) and Belo Horizonte-MG (Cabral et al., 2018). Only 0.4% of cases involved observation of the animal, although most were initially healthy and could have been observed. In 78% of cases, the conduct was considered appropriate (according to Ministry of Health regulations) (Brasil, 2014; Brasil, 2017). This percentage was higher compared to Cuité-PB (59.2%) (Azevedo et al., 2018) It was found that 14.7% of individuals received excessive doses of the vaccine when the vaccination scheme could have been interrupted. This percentage was lower in Cuité-PB (3.3%) (Azevedo et al., 2018). Additionally, 7.3% of individuals did not complete the vaccination scheme, indicating not only a lack of knowledge among the population but also deficiencies in actively seeking absent patients on vaccination days and, consequently, a low integration between surveillance, primary care, and health services.

CONCLUSION

The analysis of the results reveals that, despite Itaporanga-PB predominantly adopting appropriate practices compared to other municipalities, significant issues persist regarding the completeness of prophylactic schemes and the completion of notification forms.

These challenges undermine the effectiveness of epidemiological analysis and hinder the implementation of effective preventive measures. To improve case analysis and the adoption of appropriate measures, it is essential to invest in the continuous training of health professionals and in the enhancement of processes for evaluating, monitoring, and reporting incidents, through the complete filling out of notification forms.

Additionally, it is recommended to implement an epidemiological mapping of animal rabies and establish a Zoonosis Control Center, which would contribute to more precise monitoring and a more effective response to incidents.

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