

## Preplanned Studies

## Epidemiological Study of Outpatients in Rabies Post-Exposure Prophylaxis Clinics — Tianjin Municipality, China, 2020

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### Summary

#### What is already known on this topic?

Rabies remains a serious public health problem in China. The only way to prevent the fatal disease was through timely and adequate post-exposure prophylaxis (PEP).

#### What is added by this report?

Among all the 126,133 cases visited Tianjin PEP clinics during 2020, more than 90% of the patients were injured by domestic dogs or cats, and about 70% of the animals received vaccination. Most outpatients have knowledge of rabies and show high compatibility with PEP.

#### What are the implications for public health practice?

To better control rabies, we need to pay more attention to people who lack knowledge of rabies and help them gain awareness of PEP.

Rabies remains a serious public health problem in China. The disease is preventable through timely provision of adequate post-exposure prophylaxis (PEP), and designated PEP clinics exist in China to provide PEP treatment. This study aimed to understand the characteristics of outpatients in rabies PEP clinics to provide a basis for follow-up work. Data in this study was from an electronic, PEP clinic-based case registration system, including case information, exposure history, PEP recommendations, and vaccination status, which covered all 91 clinics in Tianjin Municipality from January 1 to December 31, 2020. Among all the 126,133 first-visit cases, more than 90% of the patients washed the wound by themselves and went to PEP clinics within 24 hours after exposure; 97.04% of the outpatients received the first dose of the rabies vaccine; and 94.64% of the outpatients completed the whole schedule of doses (5-doses/2-1-1 regimen). The result showed that most of the outpatients have knowledge of rabies. To better control rabies, we need to pay more attention to people who do not know about rabies and help them establish

awareness of PEP.

A total of 126,133 first-visit cases sought a consultation to PEP clinics in Tianjin Municipality from January 1 to December 31, 2020. The reported exposure rate was 909.66/100,000 population. Among all the cases, 50.97% were female (n=64,291). The mean age was 36.3 years (range: 3 months to 99 years). The major exposure animal was dogs (56.06%) and cats (40.78%); most of the animals were domesticated with identified owners (92.20%), and 69.47% of them had rabies vaccination history. Among total exposures, 50.38% (n=63,381) were classified as category III (single or multiple transdermal bites or scratches, etc.). Hands (56.56%, n=65,032) and legs (21.09%, n=26,000) were the most common sites for exposures. More than 90% of patients washed their wounds before arriving to PEP clinics and 57.98% of the cases finished wound-washing in the PEP clinics; 89.40% of the cases went to the PEP clinics within 24 hours after exposure (Table 1).

Among the 106,769 persons with category II or III exposure who had no history of prior rabies vaccination (or re-exposure >3 years), 96.68% (n=103,221) received the first dose of rabies vaccination. Nearly 95% of the cases completed the whole schedule of doses. Adherence to rabies is shown in Table 2. Only 25.21% (n=15,979) of the cases with category III received the rabies immunoglobulin (RIG).

## DISCUSSION

Tianjin is one of the four municipalities of China with a population of roughly 14 million people. This study shows that the annual incidence of rabies exposure was 909.66/100,000 population. But the actual incidence may be much higher than our data since almost none of the reported rabies patients went to see a doctor after they got rabies exposure (1–2).

The standard PEP treatment comprises of wound treatment, rabies vaccine, and RIG if warranted (3). The fear of acquiring rabies and knowledge of the

TABLE 1. Characteristics of the patients visited post-exposure prophylaxis clinics in Tianjin Municipality, China, 2020.

Characteristics	No. of reported exposures	Percent (%)
Sex		
Male	61,842	49.03
Female	64,291	50.97
Exposure category		
I	2,859	2.01
II	59,893	47.61
III	63,381	50.38
Exposure site		
Hands	65,032	51.56
Legs	26,600	21.09
Arms	16,244	12.88
Feet	7,900	6.26
Head/face/neck	5,372	4.26
Trunks	4,985	3.95
Multi-sites (more than one area)	2,668	2.12
Animal		
Dog	70,707	56.06
Cat	51,433	40.78
Other	3,993	3.16
Owner status		
Owned	116,292	92.2
Not owned	9,841	7.80
Animal vaccination history		
At least one	80,793	64.54
Never/unknown	45,340	35.46
Type of exposure		
Bite	77,417	61.38
Scratches	45,011	35.69
Others	3,705	2.93
Interval between exposure and medical attention		
2 hours	50,974	40.41
2–6 hours	21,828	17.31
24 hours	39,953	31.68
>24 hours	13,378	10.60
Wound washing		
By one's own	116,164	92.10
By the clinics	72,944	57.83
History of exposure and re-exposure		
Within 6 months	3,528	2.27
6 months to 1 year	4,785	3.79
1–3 years	8,192	6.49

TABLE 2. Adherence to rabies vaccination advice among persons who visited the post-exposure prophylaxis clinics in Tianjin Municipality, China, 2020.

Dose	No. of people actually vaccinated	No. of people should be vaccinated (5 doses/2-1-1 regimen)	Completion rate (%)
1	103,221	106,769	96.68
2	102,470	106,769	95.97
3	101,917	106,769	95.46
4	101,415	106,769	94.99
5	95,488	100,899	94.64

gravity of the disease, as well as the cost of PEP were main factors affecting PEP compliance (4).

Among all the exposures, more than 90% were caused by domestic dogs or cats, and the animal vaccination rate was much higher than that in the other studies (1,5–6). Almost 10% of the patients were re-exposed. The high proportion of outpatients who cleaned the wound after exposure, visited PEP clinics within 24 hours (h) after exposure, and adhered to rabies vaccination showed that the majority of outpatients in the PEP clinics understood the risks of rabies.

The adherence to rabies vaccination was very high in Tianjin. The completed inoculation rate was close to 95%, which was much higher than the results in other studies (6). However, it should also be noted that there were still a small number of patients who had not been vaccinated, the causes of which need to be further explored. Taking a 60 kg person as an example, the cost of RIG is about 5 times of the rabies vaccine. The high price may be a barrier to practical use.

Almost all rabies cases were not treated with regular PEP (1–2). We can find that many of the outpatients in our study were not at high risk to rabies exposure (injured by immunized domestic animals, exposure sites were not on the face or the head, etc.). This is a reminder to prioritize providing education on rabies knowledge to the high-risk groups, e.g., populations in rural areas with large populations of dogs, low animal immunization rates, and little knowledge of rabies — so they would be more aware of the harm of the disease.

The study was subject to at least two limitations. First, the data comes from PEP clinic-based case registration system. There may be duplicate cases in our study because the ID numbers were not required for entry into the system. Second, data only covered information in Tianjin Municipality; if a patient went to another province for vaccination after the first

consultation, this could not be reflected in the data.

In conclusion, to better control rabies, we need to pay more attention to people who lack knowledge of rabies and help them gain awareness of PEP. Meanwhile, we should also continue to manage PEP clinics to ensure the standardization and effectiveness of the treatment.

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