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Research Article

Delayed or Missed Anti-Rabies Vaccine : A Barrier in Eradication of Rabies

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A B S T R A C T

Background: Achieving the goal of zero rabies deaths by 2030 requires 100% compliance with Post-Exposure Prophylaxis (PEP). PEP is administered over a month with multiple doses, and adherence—both in terms of completing all doses and following the prescribed schedule—is a key component of the prevention strategy.

Objective: To estimate the proportion of patients adhering to the anti-rabies vaccination schedule following an animal bite

Method: A descriptive cross-sectional design was used to collect data from patients receiving anti-rabies vaccinations at an animal bite clinic in a tertiary care hospital in North West Delhi. Data are presented as the number and proportion of patients, categorised by days since the bite. Patients were grouped into four categories for analysis: those who presented on the day of the bite up to two days later, on the third to the sixth day, on the seventh to 27th day, and on or after the 28th day.

Results: All patients who visited on the day of the bite received their first dose. Among those presenting three to six days post-bite, 88.2% received two doses (as per schedule), while one patient had not received any dose and another had taken only one dose. Of those presenting between seven and 27 days post-bite, 8.8% had received all four doses, 75% received three doses, and one patient received only two doses. Among those presenting on or after the 28th day, the majority (93.8%) had received all four doses; however, one patient had received only a single dose.

Conclusion: Patients who delayed or missed the doses were predominantly those scheduled for the second and third doses.

Keywords: Scheduled Vaccine, Rabies Vaccine, Post-Exposure Prophylaxis

Introduction

The WHO's roadmap for neglected tropical diseases (2021–2030) targets rabies elimination as a public health issue in 155 countries by 2030, aiming for zero human deaths from dog-transmitted rabies, under the goal termed "Zero by 30."[1] India, responsible for over one-third of the global rabies fatalities, has developed the National Action Plan for dog-mediated Rabies Elimination from India by 2030 (NAPRE) under the National Rabies Control Program (NRCP) to eradicate rabies by 2030.[2] Timely post-exposure administration of anti-rabies vaccines (ARVs), effective wound care, and the concurrent use of rabies immunoglobulin (RIG) in severe cases are nearly 100% effective in preventing the disease. However, limited awareness of post-exposure prophylaxis (PEP) and poor adherence to vaccination schedules significantly increase mortality rates following animal bites.[3,4] Achieving zero rabies deaths by 2030 hinges on ensuring 100% compliance with PEP protocols.

Objective

To analyse the proportion of patients taking anti-rabies vaccine doses as per schedule after the day of the animal bite

Method

A cross-sectional study was conducted at the animal bite clinic of a tertiary care hospital in the northwest district of Delhi, a nodal centre for the district programme that manages approximately 5000 animal bite cases per month. The clinic's nodal officer had presented to the Department of Community Medicine the issue of patients not adhering to the scheduled vaccine timings as outlined in the programme. The clinic follows the updated Thai Red Cross Regimen, administering four doses of the anti-rabies vaccine.[5] To provide evidence of this issue, the authors documented the number of anti-rabies vaccine doses taken by animal bite cases attending the clinic, categorised by the number of days since the bite. This study was completed in February 2024.

Results

Data from 78 animal bite patients' was retrieved from records maintained by the medical officer, noting days since the bite, the category of bite, and number of vaccine doses taken. The median duration since the bite was 4 days (ranging from 0 to 82 days). For analysis, the data was categorised into four groups: patients who presented on the day of the bite up to two days later, from the third to sixth day, the seventh to 27th day, and on or after the 28th day.

Approximately, 78.2% of the sample were male, with a mean age of 29.49 years (SD: 15.64). At the time of data collection, 37.2% of patients had been bitten within the previous 0–2 days. In 20.5% of cases, 28 days or more had passed since the bite. The majority of patients who presented more than 28 days after the bite were classified as category three (75%) bite cases. Out of the total sample, 76.9% (60/78) were category three bites; however, only 60% of these patients (36/60) received immunoglobulin (Table 1).

Table 1.Duration-Wise Distribution of Number of Doses of Anti-Rabies Vaccine Received

Duration Since Bite					
Days	**0–2 days n (%)**	**3–6 days n (%)**	**7–27 days n (%)**	**≥ 28 days n (%)**	**Total N (%)**
Total	29 (37.2)	17 (21.8)	16 (20.5)	16 (20.5)	78 (100.0)
Category					
Two	6 (20.7)	3 (17.6)	5 (31.3)	4 (25.0)	18 (23.1)
Three	23 (79.3)	14 (82.4)	11 (68.8)	12 (75.0)	60 (76.9)
Equine immunoglobulin taken					
Yes	11 (37.9)	6 (35.3)	10 (62.5)	9 (56.3)	36 (46.2)
No	18 (62.1)	11 (64.7)	6 (37.5)	7 (43.8)	42 (53.8)
Number of vaccine doses taken					
None	-	1 (5.9)	-	-	1 (1.3)
One	29 (100.0)	1 (5.9)	-	1 (6.3)	31 (39.7)
Two	-	15 (88.2)	1 (6.3)	-	16 (20.5)
Three	-	-	12 (75.0)	-	12 (15.4)
Four	-	-	3 (8.8)	15 (93.8)	18 (23.1)

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According to programme guidelines, the vaccine should be administered on the day of the bite (day zero), and then on the third, seventh, and 28th days. All patients who visited on the day of the bite received the first dose as scheduled. Discrepancies began after the initial dose. Among patients presenting 3–6 days post-bite, 88.2% received two doses (as per schedule); one patient had not received any dose, and another had taken only one dose. Of those visiting between 7 and 27 days post-bite, 8.8% had completed all four doses, 75% had taken three doses, and one patient had taken only two doses. Among those presenting on or after 28 days, the majority (93.8%) had received all four doses; however, one patient had received only a single dose.

Discussion

Panda and Kapoor, in their study from a tertiary care centre in South Delhi, reported 47.8% compliance with the complete course of the anti-rabies vaccine (administered on schedule) and 6.7% compliance with delayed administration (full dose but delayed).[6] This information was not examined in the current study; however, it is evident that non-compliance is an issue at other locations as well. In the present analysis, 5% (4/78) of patients did not adhere to the schedule, as shown in Table 1. Sharma et al., from a primary health centre in Fatehpur, Delhi, reported that 28.8% of patients completed the full vaccination course.[7] Another study from China found a 62% adherence rate to the Zagreb vaccination regime,[8] while a cohort study from Pennsylvania reported full vaccination compliance in 73.2% of animal bite cases[9].

The current analysis, combined with previous studies, clearly shows that non-compliance and delays in receiving anti-rabies vaccination are issues in both India and other countries. This non-compliance can be attributed to multiple factors related to both patients and health systems. The findings of this study will form the basis for a cohort study to be conducted at the same centre, following up with patients to understand any delays in receiving scheduled doses. This variable has now been included in the programme's monthly reporting format. However, clinic staff and doctors currently only record the number of patients who complete the vaccination course. Maintaining detailed data on individual doses remains challenging in the resource- and manpower-limited settings in which these animal bite clinics operate.

Conclusion

The data presented in this analysis marks the starting point of a project examining the reasons for non-compliance with the prescribed schedule of anti-rabies vaccination. The current analysis reveals that patients generally receive the first dose promptly after a bite. However, the second and third doses are often not taken as per the schedule. Compliance could be improved through increased awareness among patients and ensuring readiness and availability of services whenever required.

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