

The crux of Pakistan's prolonged rabies vaccine shortage: A rising mortal threat in the COVID-19 pandemic

Dear Editor,

The shortage of rabies vaccine and rabies immunoglobulin (RIG) in rural Sindh, Pakistan, has resulted in the death of a 10-year-old boy.¹ The boy was bitten by a stray dog in a rural town of Sindh, where he was first taken to a primary care clinic but, due to unavailability of vaccine, had to be taken to a tertiary care hospital in Larkana.¹ In a similar scenario, 4 months ago, a 7-year-child died due to a lack of rabies vaccine in Shikarpur.² Currently, Pakistan is facing a shortage of more than 800 000 doses.² Due to this chronic shortage, the available vaccine supply is dwindling, and with additional COVID-19 restrictions,³ there is an increased risk of rabies-related fatalities.

Rabies places a significant strain on Pakistan's healthcare system.⁴ In the general trend, the bites from rabid dogs tend to increase in the summers during May–August.⁴ Generally, men and children are more susceptible to dog bites.⁴ Previous studies have reported up to 5000 deaths per year due to rabies in Pakistan.⁵ Although the surveillance is not organized at the national level, nor is WHO's Rabinet active online to survey through the rising trends or mortality.⁵ Lack of awareness about the rabid animal and rabies treatment is also a critical issue that the government has not addressed and according to a study up to 60% of respondents in a survey were found to have not sought medical attention after a suspected animal bite.⁵ There is also concern about the adequate training of medical staff to deal with cases of dog bites, especially the lack of knowledge about the administration of rabies vaccines and RIG is an issue that requires prompt attention.⁶

Recently, there has been a closure of rabies immunization centers due to a lack of attention from the local authorities.⁷ Victims are forced to seek rabies vaccine from private sources due to their shortage at government facilities.⁷ However, the issue of dog bites has reached such proportions in the province of Sindh that the court has suspended the membership of two lawmakers in the provincial assembly due to an increase in dog bites in their constituencies. To counter rabies, it is expected to require the vaccination of 500 000 dogs in the given province alone.⁸ Whereas it is essential to note since the COVID-19 pandemic, the lockdowns have resulted in the majority of the people staying indoor and stray animals left unfed and with no surveillance of their diseases. Therefore, there is a high population of such animals on the streets for food, exposing them to the public.⁸

According to the WHO postexposure prophylaxis (PEP) guidelines, there are three categories of exposure, and rabies vaccine is indicated in categories 2 and 3, while RIG is only required in category

3 exposure.⁴ Rabies vaccine is mandated for 5 days: Day 0, 3, 7, 14, and 28, while RIG dose administered 20 IU/kg once after exposure as per guidelines.⁹ There are around 59 000 human deaths reported as a result of rabies annually worldwide, whereas, only in Karachi, Pakistan, a data of two tertiary care hospital show 100 incidences from 2009 to 2017.¹⁰



In Pakistan, there is no practice of pre-exposure rabies vaccination of the human population or animals, which are the vector of disease. Recently, due to the economic turmoil in Pakistan, there has been a shortage of life-saving medicines.¹¹ In this case, 5-day treatment of rabies vaccine will cost around Rs. 4000 (USD 27)¹ and whereas treatment with RIG therapy of an adult (70 kg) patient will cost around Rs. 35 000 (USD 235). We conducted a telephonic survey to check the availability of these medicines in government and private sector hospitals and community pharmacies in two urban cities of Punjab, Pakistan. The data was astounding, as these vaccines were only available at two major private sector hospitals and one government hospital. In community pharmacies, only two pharmacies (large chain pharmacies) had rabies vaccines at selected outlets, while RIG was only available at one outlet. As a result, it is understood that the cost of therapy has resulted in its shortage from government sector hospitals, which are already stricken by the current government's austerity drive, but it is also less likely to be found in private pharmacies due to its cost burden on inventory.¹² The other shortcoming is that all medicines for PEP therapy are imported in Pakistan, and most of them were imported from India. After the cuts on imports with an escalation in dollar price and regional tension on the Kashmir issue, the availability of these medicines has been severely hampered. Although the ban on pharmaceuticals has been lifted on imports from India, it has not improved as yet.¹³

The solution lies in the production of rabies vaccines and RIG in Pakistan and taking measures to limit the population of stray dogs, and vaccinating the existing animal population that can be vectors of rabies virus. Public awareness programs should emphasize prompt first-aid and presenting the patient to the nearest health facility without any delay. On the other hand, the government should ensure the availability of rabies vaccines and take measures for their proper storage in rural and urban districts.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

¹Currency conversion: USD 1 = Rs. 150.

Adeel Siddiqui¹ 
 Ali Ahmed² 
 Maria Tanveer³
 Asma Arshad⁴

¹Department of Pharmacy,
 Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore,
 Pakistan

²School of Pharmacy,
 Monash University, Subang Jaya, Selangor, Malaysia

³Department of Pharmacy,
 Quaid-i-Azam University, Islamabad, Pakistan

⁴Allama Iqbal Open University, Islamabad, Pakistan

Correspondence

Ali Ahmed, School of Pharmacy, Monash University, Jalan Lagoon
 Selatan, Bandar Sunway, 47500 Subang Jaya, Selangor, Malaysia.

Email: ali.ahmed@monash.edu

ORCID

Adeel Siddiqui  <https://orcid.org/0000-0001-7517-277X>

Ali Ahmed  <https://orcid.org/0000-0002-8964-1853>

REFERENCES

- Khan S. Boy dies of rabies in Larkana due to unavailability of vaccine. *The News*. September 18, 2019.
- Masood T. Lack of anti-rabies vaccines at govt hospitals puts lives at risk. *DAWN*. May 27, 2019.
- Saqlain M, Munir MM, Ahmed A, Tahir AH, Kamran S. Is Pakistan prepared to tackle the coronavirus epidemic? *Drugs Ther Perspect*. 2020;36(5):213-214.
- Ilyas N, Rahim K, Latif Z. Incidence of dog bite in rural area (Chountra), District Rawalpindi, Province Punjab, Pakistan. *J Med Allied Sci*. 2017;7(2):99-102.
- Ahmed T, Hussain S, Rinchen S, et al. Knowledge, attitude and practice (KAP) survey of canine rabies in Khyber Pakhtunkhwa and Punjab Province of Pakistan. *BMC Public Health*. 2020;20:1293.
- Salahuddin N. Proper training needed for anti-rabies vaccination in Sindh: expert. *Sanaa News*. March 1, 2021.
- Lodhi A. Dog bite victims face ARV shortage. *The Express Tribune*. November 3, 2020.
- Desk W. Stray dog bites eight-year-old boy in Faisalabad. *ARY News*. March 20, 2021.
- World Health Organization. Rabies vaccines: WHO position paper, April 2018—Recommendations. *Vaccine*. 2018;36(37):5500-5503.
- WHO DPTRE. Results of Gavi's Learning Agenda on rabies and new WHO position on rabies immunization. Meeting Report; 2018; 2018. p. 1-3.
- Atif M, Malik I, Mushtaq I, Asghar S. Medicines shortages in Pakistan: a qualitative study to explore current situation, reasons and possible solutions to overcome the barriers. *BMJ Open*. 2019;9:e027028.
- Nawaz S. Changing trends of the European development co-operation with Pakistan. *Strat Stud*. 2018;38(4):52-68.
- Junaidi I. Ban on import of Indian medicines lifted. *DAWN*. September 4, 2019.