Journal of Medical Microbiology and Infectious Diseases

JoMMID
ISSN: 2345-5349
eISSN: 2345-5330

World Rabies Day with One Health Approach in Iran

Mehdi Fazlalipour[1, 2*], Farzaneh Sheikholeslami[1*]

[1]WHO Collaborating Centre for Reference and Research on Rabies, Pasteur Institute of Iran, Tehran, Iran; [2]Rapid Response Team for Infectious Diseases, Pasteur Institute of Iran, Tehran, Iran

ARTICLE INFO

Short Report

Keywords: World Rabies Day, One health, Rabies control, Rabies elimination, Intersectional collaboration, Health education, Iran

Received: 22 Oct. 2024
Received in revised form: 05 Nov. 2024
Accepted: 09 Dec. 2024
DOI: 10.61186/JoMMID.12.4.317

***Correspondence**
Email: f_sheikh@psateur.ac.ir, mfp.virology@gmail.com
Tel: +98216695331120
Fax: +982164112813

Date of Conference: September 28, 2024

ABSTRACT

Introduction: Rabies is a deadly viral disease that persists in many countries, causing mortality in both humans and animals. Raising public awareness is crucial for rabies control, and World Rabies Day serves as an annual platform to educate communities and promote strategies for the prevention and eventual elimination of this disease globally. This study aimed to evaluate the impact of the World Rabies Day conference, held on September 28, 2024, which adopted a One Health approach to coordinate the activities of the Ministry of Health, the Veterinary Organization, and the WHO Collaborating Center for Reference and Research on Rabies. The conference aimed to disseminate information and enhance the capacity of targeted health professionals across Iran to implement effectively rabies control strategies. **Conference structure and highlights:** This conference was conducted in a hybrid format, featuring both in-person and online sessions. Participants could attend either in person or virtually via webinar**.** Key topics discussed included rabies virology and pathogenesis, epidemiology, the roles of veterinary organizations and the Iranian CDC, education and prevention strategies, treatment protocols, and virus detection methods. The insights gained from this scientific event are expected to inform policy decisions and guide the efforts of health authorities and relevant organizations in effectively controlling rabies in Iran. **Conclusion/impact:** Raising awareness about rabies virus virulence and the importance of rabies control within both medical and veterinary fields is crucial for achieving elimination goals. By providing targeted training to health professionals and educating the public, the conference and the broader One Health approach can contribute to significant progress towards rabies control and eventual elimination in Iran. This integrated approach fosters collaboration and strengthens the capacity for effective rabies prevention and control measures.

INTRODUCTION

Globally, rabies is estimated to cause 59000 human fatalities each year, primarily in underserved populations [1, 2]. In Iran, rabies continues to pose a public health challenge, with an average of nine human deaths per year. During the period from 2002 to 2011, more than 1,000,000 animal bite cases received timely post-exposure prophylaxis. The annual incidence rate of animal bites in northern Iran was 386.3 per 100,000 people from 2016 to 2022. Dogs were responsible for 81% (33,277 cases) of these animal bites, highlighting the significant role of canine transmission in the spread of rabies [3-5]. This underscores the importance of targeted interventions to address the specific epidemiological context within the country.

Alongside advancements in rabies pathophysiology, particularly in the areas of neuroimmune biology and mechanisms of viral infection, the World Health Organization (WHO) has updated its guidelines for rabies prevention [6-9]. Established in 2007 by the Global Alliance for Rabies Control and the Centers for Disease Control and Prevention, World Rabies Day, held each year on September 28, provides a focused opportunity to educate communities worldwide about rabies prevention and control and galvanize support for elimination efforts [10-12].

One Health is a collaborative, multisectoral, and transdisciplinary approach-working at the local, regional, national, and global levels-with the goal of achieving

[DOI: 10.61186/JoMMID.12.4.317]

optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment [13, 14]. The One Health approach is crucial for controlling and eliminating rabies, as it integrates human, animal, and environmental health sectors to enhance surveillance, prevention, and control efforts. This collaborative framework involves multisectoral cooperation, including veterinarians, public health practitioners, and environmental experts, to implement strategies such as Integrated Bite Case Management (IBCM) and large-scale dog vaccination campaigns [15, 16].

The National Centre for Reference and Research on Rabies was established at the Pasteur Institute of Iran in 1923. It subsequently became a WHO Collaborating Centre for Reference and Research on Rabies in 1976. The Rabies Department of the Pasteur Institute of Iran plays a key role in implementing the national rabies control strategies by conducting regular training programs for experts and public awareness campaigns, particularly in conjunction with World Rabies Day [17, 18].

Conference Overview

In observance of World Rabies Day, a national conference, "Rabies with a One Health Approach," was convened on September 28, 2024, in Pasteur Institute of Iran, by the Rabies Department. This conference specifically targeted professionals involved in human and animal health, including physicians, veterinarians, public health officials, and researchers, as well as students and trainees in these fields, totaling approximately 500 participants (Table 1).

Table 1. Overview of the World Rabies Day Conference with One Health Approach in Iran

Category	Details
Event Title	World Rabies Day with a One Health Approach in Iran
Date	September 28, 2024
Venue	Pasteur Institute of Iran
Format	Hybrid (in-person and online webinar)
Target Audience	- Physicians - Veterinarians - Public Health officials - Researchers - Students and trainees - Laboratory technicians
Key Topics Covered	- Rabies virology and pathogenesis - Epidemiology (global, regional, and national) - Roles of veterinary organizations - Role of Iranian CDC (centers for Disease control and Prevention) - Education and prevention strategies - Treatment protocols and prophylaxis - Different viral detection methods
Organizing Bodies	- WHO Collaborating Centre for Reference and Research on Rabies in Iran - Pasteur Institute of Iran - Ministry of Health (Iranian CDC) - Iran Veterinary Organization
Main Objectives	- Disseminate information on rabies control - Enhance capacity of health professionals - Enhance capacity of Veterinary professionals - Promote One Health approach - Strengthen national and international collaboration
Focus Areas	- Public health education - Professional training - Laboratory diagnostics - Prevention strategies - Treatment protocols and prophylaxis

Conference Proceedings

The introduction outlined the Pasteur Institute of Iran's pivotal role in rabies control from its inception in early 1920s to the present. Key historical milestones in the national rabies control program were presented, along with the Institute's initial activities, such as the production of vaccines and sera necessary for controlling infectious diseases, including rabies, from its early years [19].

Experts at the conference presented rabies virology and pathogenesis, focusing on specific viral strains prevalent in Iran, such as the identification of distinct viral variants with different epidemiological origins, and recent research findings on the molecular and antigenic characterization of rabies viruses, including the distribution of these variants across different regions of the country. The presentations also detailed the current status of animal bite incidents in Iran and the MOHME's wound management and post-exposure prophylaxis protocols, which adhere to WHO guidelines [20, 21]. Specifically, the protocols address categories of bite exposures, administration of rabies immune globulin

[DOI: 10.61186/JoMMID.12.4.317]

(RabIg), and the administration of rabies vaccine. These conference discussions highlighted the importance of the MOHME's comprehensive rabies prevention and treatment programs, which are essential components of the national strategy for rabies control and elimination [3]. This ongoing work includes public awareness campaigns to educate the public about the risks of rabies and the importance of immediate medical attention after animal bites, vaccination programs for dogs to reduce the reservoir of the virus in the animal population, and the provision of post-exposure prophylaxis (PEP) including rabies immune globulin and vaccine administration to individuals exposed to potentially rabid animals.

The seminar also addressed the epidemiology of rabies globally, regionally (Middle East), and nationally (Iran), with a particular focus on identifying the circulating rabies virus variants within Iran. Understanding the viral distribution within Iran and surrounding regions is crucial for determining the endemic status of specific variants and enables genetic tracking of viral spread and evolution.

Given the zoonotic nature of rabies and the diverse range of animal hosts, understanding the prevalence of the virus in wildlife and domestic animals, particularly free-roaming dogs, is critical. The seminar evaluated specific actions undertaken by the veterinary organization in rabies control and prevention, including vaccination campaigns and surveillance programs. The collaborative efforts between the Iran Veterinary Organization, the Iranian Department of Environment, and the Ministry of Health were also examined, along with strategies for rabies control in Iran [18].

Following presentations on the roles of the Ministry of Health, the Iran Veterinary Organization, and the Iranian Department of Environment, the seminar participants proposed collaborative, One Health-focused strategies for rabies prevention and control [22]. These strategies emphasized increased coordination between the involved organizations. The participants highlighted the importance of conducting regular and widespread vaccination campaigns for dogs to reduce the reservoir of the rabies virus. The strategies also emphasized the need for public awareness and education campaigns to improve the understanding of the risks related to rabies, as well as how to prevent them. This includes educating the public on responsible pet ownership, the importance of avoiding contact with wildlife, and the need for prompt medical attention after animal bites.

The seminar highlighted the WHO's emphasis on rabies education and training. This included discussions of specialized training programs for healthcare professionals on rabies diagnosis, treatment, and post-exposure prophylaxis (PEP), as well as the importance of pre-exposure prophylaxis (PrEP) for high-risk groups [23]. The seminar also addressed public health education initiatives focusing on rabies prevention and control measures [24]. Furthermore, laboratory diagnostic methods for rabies virus detection were reviewed [25].

Conference Outcomes

World Rabies Day has played an increasingly important role over the past decade in raising awareness and galvanizing support for rabies control efforts. The event serves as a platform to advocate for key strategies such as enhanced reservoir vaccination programs and improved access to prompt and appropriate post-exposure prophylaxis (PEP), including wound care, rabies immunoglobulin, and vaccination. Strengthened collaboration between key stakeholders within Iran (*e.g.*, the Ministry of Health, the Iran Veterinary Organization, and the Iranian Department of Environment), as well as international partnerships with the WHO and other relevant organizations, are essential for developing and implementing comprehensive rabies control programs [26]. While global elimination of dog-mediated human rabies deaths by 2030 is a shared objective, achieving this goal requires sustained, multi-sectoral efforts and a recognition of the ongoing challenges.

ACKNOWLEDGEMENT

The organizers of this seminar extend their sincere gratitude to the staff of the Rabies Department of the Pasteur Institute of Iran, the Iranian Center for Infectious Diseases Control and Prevention, and the Iran Veterinary Organization. We also thank volunteers and all other individuals who contributed to the success of this event. We sincerely thank all the speakers who helped us by giving speeches including: Dr. Ehsan Mostafavi (Pasteur Institute of Iran), Dr. Farzaneh Sheikholeslami (Pasteur Institute of Iran), Dr. Mehdi Fazlalipour (Pasteur Institute of Iran), Dr. Mohammad Reza Shirzadi (Ministry of Health, CDC of Iran), Dr. Mehdi Rahpeyma (Pasteur Institute of Iran), Dr. Karim Amiri (Iran Veterinary Organization), Dr. Mohammad Hossein Fallah (Razi Vaccine and Serum Production Research Institute), Dr. Firouzeh Farahtaj (Pasteur Institute of Iran), Dr. Zohre Eftekhari (Pasteur Institute of Iran), Dr. Terence Scott (Global Alliance for Rabies Control), Dr. Gyanendra Gongal (WHO Regional Office for south East Asia).

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest associated with this manuscript.

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Cite this article:
Fazlaipour M, Sheikholeslami F. World Rabies Day with One Health Approach in Iran. J Med Microbiol Infect Dis, 2024; 12 (4): 317-320. DOI: 10.61186/JoMMID.12.4.317.

[DOI: 10.61186/JoMMID.12.4.317]