LETTER TO EDITOR

Commentary on "Exploring the Phenotypic Profile of Acute Flaccid Paralysis: Insights from a Third-Level Pediatric Emergency Room"

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Received: 28 Sep 2025
Accepted: 7 Oct 2025
Published: 1 Jan 2026

How to cite this article: Hosseinpour S, Ashrafi MR, Heidari M, Parvaneh N, Tavasoli AR. Commentary on "Exploring the Phenotypic Profile of Acute Flaccid Paralysis: Insights from a Third-Level Pediatric Emergency Room". Iran J Child Neurol. 2026;20(1): 85-87. https://doi.org/10.22037/ijcn.v20i1.50473.

Acute flaccid paralysis (AFP) may arise due to various underlying factors, such as acute poliomyelitis caused by poliovirus or other neurotropic viruses, vaccine-associated paralytic poliomyelitis (VAPP), acute myelopathy, Guillain-Barré syndrome (GBS), systemic illnesses, disorders affecting the neuromuscular junction, or muscular conditions.[1]

Iran has played a significant role in the worldwide polio eradication effort, successfully eliminating locally transmitted wild virus — the country's last recorded indigenous case dates back to 1997.[2,3] Importation of wild poliovirus from neighboring endemic countries, Afghanistan and Pakistan, was halted by December 2000.[4] Despite this success, vaccine-associated paralytic poliomyelitis (VAPP) remains a rare yet significant condition linked to the oral polio vaccine (OPV). A limited number of genetic substitutions leading to minor changes can result in an attenuated phenotype during OPV replication in humans. Theses mutations are responsible for the rare instances of VAPP in OPV recipients and their close contacts.[5,6]

In the history of Polio reports in Iran, Shahmahmoodi et al. documented six cases of paralytic poliomyelitis caused by immunodeficient vaccine-derived polioviruses (iVDPVs), diagnosed between 1995 and 2008 in cases with AFP. Data from the Iran National Polio Laboratory (Iran-NPL) highlight a significant concern regarding the reversion of the vaccine poliovirus to VDPV, a rare but severe adverse effect associated with using the oral polio vaccine.[7]

In line with the previous study in Iran, the present hospital-based study investigated the causes of AFP. The primary objective of the authors was to identify the main diagnoses in children presenting with acute motor limb weakness, such as acute poliomyelitis, VAPP, acute myelopathy, GBS, acute transverse myelitis (ATM), and others, at the Children's Medical Center Emergency Room (CMC-ER) in Iran between 2011 and 2016. As stated in the results, the three most common diagnoses were GBS, acute viral myositis, and ATM.

Among the 80% of enrolled patients who underwent stool testing, 97.5% had normal or nonspecific findings, while botulinum toxin was detected in 2.5%

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of cases. The negative results of the stool tests were attributed to the wild type of poliovirus; researchers identified six cases of iVDPV. The authors of this commentary aim to emphasize that the stool test results of six patients were not included in the hospital's stool test records. In other words, six iVDPV cases were reported by the reference laboratory. Nevertheless, these cases were not included in the statistics presented in the referenced article.

As one of the definitions of VAPP is "isolation of vaccine virus (Sabin-like: SL) from the stool of the paralyzed child, based on the iVDVP isolation from the stool samples of six patients, a laboratory diagnosis of iVDPV instead of clinical diagnoses of VAPP is proposed."

A VAPP diagnosis requires meeting the following criteria:

1. The paralytic illness must present clinical features consistent with poliomyelitis, including residual paralysis persisting 60 days after onset. Additionally, there should be no epidemiological connection to confirmed cases of wild poliovirus or poliomyelitis outbreaks.

2. At least one adequate stool sample must test negative for wild poliovirus in a WHO-accredited laboratory while testing positive for a Sabin-like (vaccine) virus.

3. Other potential causes of flaccid paralysis, including GBS, transverse myelitis, neuritis, tumors, and trauma, must be excluded.

4. The patient must be assessed by an expert committee evaluating supplementary information such as exposure history, clinical findings, virological data, and possible epidemiological connections to confirmed poliomyelitis cases. The diagnosis of VAPP must be confirmed by the National Expert Committee, comprising a pediatrician, neurologist, virologist, and an epidemiologist or public health specialist, for the final classification of AFP cases.[5,6]

Adequate specimens for diagnostic purpose consist of two stool samples collected with at least 24-hour interval between collections. These must be obtained within 14 days following paralysis onset and arrive at the laboratory in sufficient volume and proper condition. Good condition ensures no desiccation, proper documentation, and confirmation that the cold chain was maintained. Since 1996, stool samples from all AFP cases in Iran have been sent to the Iran-NPL for poliovirus detection, with cell culture serving as the gold standard diagnostic method.[5]

VDPVs are categorized according to their degree of genetic divergence from the original oral polio vaccine strain, as measured by nucleotide variation in the complete viral protein 1 (VP1) coding sequence. VDPVs are categorized into three types:

- Circulating VDPV (cVDPV) is identified when surveillance confirms community transmission of VDVP strains. Circulation of VDPV occurs when populations are inadequately immunized.
- Immune deficiency-associated VDPV (iVDPV) occurs when the VDPV is detected in the stool specimen of a person with primary immune deficiency.
- Ambiguous VDPV (aVDPV) is when the VDPV is detected in sewage or a healthy individual.[5]

In conclusion, due to the diagnostic significance of poliovirus (either Sabin-like virus in VAPP cases or VDPV in AFP cases), healthcare centers need to collaborate with reference laboratories to ensure accurate poliovirus diagnoses. Among the six cases analyzed in the present study, as well as six additional cases documented between 1995 and 2008, the vaccine-derived poliovirus (VDPV) detected in stool samples was notably consistent with patterns typically associated with iVDPV.

To ensure inclusion of all AFP cases in poliovirus surveillance, it is recommended that care be taken in the registry of AFP cases in hospitals and healthcare centers. Even when the patient is unconscious, sending a rectal swab can help in detecting Sabin-like virus in a probable VAPP case or in detecting VDPV in a primary immunodeficient paralyzed patient.

Acknowledgment

The authors would like to express their sincere gratitude to Iran-NPL and the World Health Organization (WHO), the accredited poliovirus reference laboratory in Iran for their invaluable collaboration in collecting data for this study. Their support and expertise were essential to the success of this research, and we greatly appreciate their contributions.

Authors' Contribution

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Conflicts of Interest

None

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