фиброз и цирроз печени, гепатоцеллюлярную карциному, что сопровождается высокой вирусной нагрузкой и сочетается с не менее, чем одним внепеченочным проявлением в 40–74% случаев [1].

Выводы

Результаты анализа доступных источников литературных данных и историй болезни пациентов говорят о том, что системный характер патологического процесса при инфицировании вирусом гепатита С является причиной «многоликости» ХВГС с точки зрения его клинических проявлений. Дальнейшее изучение данной проблемы позволит снизить частоту осложнений у данной категории пациентов и улучшит качество их жизни.

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УДК 616.832.21-002-036.2-036.22(549.1)

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EPIDEMIOLOGY AND PREVALANCE OF POLIOMYELITIS IN PAKISTAN. WHY IS PAKISTAN STILL ONE OF THE TWO COUNTIRES TO BE ENDEMIC FOR POLIOMYELITIS IN THE 21TH CENTURY

Introduction

According to the World Health Organization (WHO), Pakistan is one of only two countries in the world where polio is still endemic, the other being neighboring Afghanistan. Poliomyelitis is a highly infectious disease, an acute neurologic condition that causes muscle weakness, permanent flaccid paralysis, or even death. It is caused by one of three poliovirus serotypes (WPV 1-3). Poliovirus is a single-stranded RNA virus from the Picornaviridae

family belonging to the Enterovirus genus. Transmission is via the fecal-oral route and affects children under 5 years of age. There is no cure for this disease but it can be prevented through vaccination. There are injectable inactivated and live oral polio vaccines (IPV and OPV). Although the world has seen a drastic fall in the number of poliovirus cases owing to effective immunization programs and preventive measures, Pakistan and Afghanistan remain the two endemic nations for polio, particularly wild poliovirus type 1 (WPV1), and a potential source of infection for global transmission [1].

In contrast to the global trend, the number of polio cases has increased at an alarming rate in Pakistan. In 2014, out of 359 cases reported globally 306 were from Pakistan. However, despite administering more than 300 million doses of oral vaccine annually with the help of at least 350,000 vaccinators and an expenditure of more than $9.3bn from 2013 to 2023, the country has been unable to eradicate polio. [4] Studies reveal that the rise of polio incidences throughout these years has been closely related to the lack of security of polio workers, and limited vaccine accessibility. Latest round of a national vaccination drive begun to vaccinate 9.5 million children against polio in 41 districts in Pakistan and focus particularly on areas where polio-positive sewage samples have been found. [2] In Pakistan, the campaign quality in the endemic zone of South KPK and historic WPV1 reservoirs continues to face challenges. Despite recent progress in the endemic South KPK in Pakistan, there are concerning numbers of missed children aged <5 years as many as 706,613 during the January 2024 national immunization day (NID) campaigns due to insecurity, boycotts and failure of execution of polio supplementary immunization activities (SIAs) in those areas [3][5].

Objectives

To describe the prevalence and epidemiology of poliomyelitis in Pakistan and critically evaluate the public health surveillance system for polio in Pakistan that contribute to the resurgence of poliovirus cases.

Materials and research methods

Poliovirus surveillance data, campaign reports and routine immunization coverage surveys as of September 2024 were reviewed presented by the Pakistan National Emergency Operations Centre and other GPEI partners, including the WHO. Weekly poliovirus country, regional surveillance reports including environmental surveillance data and Morbidity and mortality weekly reports (MMWR) describing Pakistan's progress toward poliomyelitis eradication were also reviewed and evaluated to write this correspondence.

The results of the research and their discussion

The Pakistan polio eradication program was officially launched in 1994 but despite more than 100 rounds of vaccination conducted over the past decade, poliovirus is still endemic in the country. Since 2015, Pakistan has reported 391 cases of polio, including 39 this year so far, as shown in Table 1. One of the victims, a two-year-old boy, died in May, while some others have been paralyzed. Polio surveillance in Pakistan is done by Acute Flaccid Paralysis accompanied by environmental surveillance of sewage samples. Genomic sequencing analyses determine genetic relationships among polioviruses identified in stool and ES specimens. An average of over 8,800 stool samples and 350 environmental samples are tested every three months. The number of WPV1 positive environmental samples in Pakistan in 2024 is 186 compared to 126 during all of 2023 while in Afghanistan in 2024 is 44 compared to 62 in all of 2023. [3] The total number of polio cases for this year has reached 39, including 20 from Balochistan, 12 from Sindh, five from KPK, and one each from Punjab and Islamabad.

Table 1 – Poliovirus cases in Pakistan in the last decade as of October 19, 2024

No. of reported cases	Reporting period	Punjab	Sindh	KPK	Balochistan	GB	AJK	ICT	TOTAL POLIO CASES
No. of WPV-1 cases	2015	2	12	33	7	0	0	0	54
	2016	0	8	10	2	0	0	0	20
	2017	1	2	1	3	1	0	0	8
	2018	0	1	8	3	0	0	0	12
	2019	12	30	93	12	0	0	0	147
	2020	14	22	22	26	0	0	0	84
	2021	0	0	0	1	0	0	0	1
	2022	0	0	20	0	0	0	0	20
	2023	0	2	4	0	0	0	0	6
	2024	1	12	5	20	0	0	1	39
No. of cDVPV2 cases	2015	0	0	2	0	0	0	0	2
	2016	0	0	0	1	0	0	0	1
	2019	1	0	16	0	4	0	1	22
	2020	25	45	42	23	0	0	0	135
	2021	1	2	1	4	0	0	0	8
	2022	0	0	0	0	0	0	0	0

Polio cases reported in the year 2023 and 2024 were 39 and 6 making 45 subjects with mean age 3.32 ± 0.5 years were affected as shown in Table 2. The age group with the most affected individuals were those under the age of 5.

Table 2 – Demographic characteristics of the children affected by poliomyelitis

Year	Gender			Age		
	Male	Female	unspecified	0 – 5	6 – 10	11 – 15
2024 (N=39)	9	4	26	30 (76.92%)	8 (20.51%)	1 (2.56%)
2023 (N=6)	2	1	3	5 (83.33%)	1 (16.66%)	0

As per Global Polio Eradication Initiative, for a country to be recognized “free of polio”, it should show an absence of WPV-1 transmission for at least three consecutive years. KPK has struggled with vaccine acceptance for years, ever since a failed vaccination campaign was arranged by the CIA in 2011 targeting the province to obtain Osama bin Laden’s family DNA. On April, 2019 a set of fake videos were circulated in the country which originated in KPK province in northwest Pakistan which claimed that children had fallen sick after being administered the polio vaccine. Additionally, false rumors that the polio vaccine either contains ingredients forbidden in Islam, or toxic ingredients that induce sterilization contributed to the sudden rise in polio cases. The emergence of Covid-19 suspended door-to-door vaccination and subsequently flooding also complicated vaccination and surveillance in the affected regions leading to serious setbacks to the polio eradication initiative. [1] On comparing the data of child polio immunization before lockdown (September 23, 2019–March 22, 2020) with the first 6 weeks of lockdown (March 23–May 9, 2020), it was observed that the mean

number of daily immunization visits declined by 52.8% (from 5,184 to 2,450 visits) and only 92,492 children were immunized as compared with 608,832 children in the same period before lockdown. Pakistan managed to flatten the COVID-19 curve, keeping the positive tests rates to less than 2% for most of July, August, September, and October which resulted in better focus on other epidemics with decline i.e.; 84 polio cases in 2020 Pakistan, compared to a total of 147 cases reported in 2019 [2].

A study conducted in Karachi, Pakistan, concluded that the major hurdles in the distribution of immunization services were perceived doubts regarding immunization process, low income, and lack of transport facilities to vaccinators for visiting remote areas. The unmonitored movement of unimmunized individuals between Pakistan and Afghanistan facilitates cross border transmission, which further exacerbates the situation. The YB3A4A is a shared cluster in the northern and southern cross-border corridors across Afghanistan and Pakistan, while the YB3A4B is mainly active in Pakistan. However, no cross-border transmission was recorded in 2022. Moreover, there has been no detection of circulating vaccine-derived poliovirus type 2 (cVDPV2) in either country in the last year. [3] Illiteracy, rumors, false religious beliefs, and the distorted law and order situation have led to numerous attacks on polio vaccinators and the security personnel's accompanying polio teams causing the death of over more 200 polio workers since 2012. This year during the latest polio vaccination drive in northwestern Pakistan a blast took place in KPK, province neighboring Afghanistan five police officers were killed and nearly two dozen others were wounded after an explosive device that targeted their vehicle [4].

Conclusions

The re-emergence of the WPV1 case in Pakistan is a wake-up call for strengthening the efforts for polio eradication. Low vaccine coverage, attacks on frontline polio health workers, misinformation, and reluctance to vaccine acceptance pose a daunting challenge for polio eradication. There is a high risk of a rise in polio cases in Pakistan if prompt measures are not taken to improve vaccination coverage and surveillance. It is high time to capitalize on the decrease in WPV1 cases by intensifying the efforts to lessen and limit the spread of the disease. Awareness campaigns about polio for locals and development of proper health system can help in the eradication of polio. Once polio is eradicated, about 40-50 billion dollars can be saved globally. With the strong commitment, seriousness and good initiatives, polio will be eradicated from Pakistan within two years more likely. The ultimate aim is a polio free world.

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