

Eradication of Poliomyelitis in Iran, a Historical Perspective

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Abstract

Poliomyelitis is a highly infectious disease caused by a virus. It invades the nervous system, and can cause total paralysis in a matter of hours. After initiation of polio eradication programme in 1988 by WHO, number of polio cases abruptly decreased. In 1988, polio paralyzed nearly 350000 children annually worldwide while in 2007 just 1360 cases reported. The programme has been started in Iran since 1991 and based on high routine immunization coverage, robust Acute Flaccid Paralysis surveillance system and very qualified supplementary immunization activities which has been established and implemented in all the country, number of reported cases decreased from 50 to zero in 2001 and Iran has been polio free since 2001. However due to endemicity of poliomyelitis in Afghanistan and Pakistan (two neighboring countries of Iran) and high level of international traveling between these countries, risk of polio importation and re-emergence of wild polio virus is very high.

Keywords: *Poliomyelitis, Eradication, Immunization, Iran*

Introduction

Poliomyelitis is a highly infectious disease caused by a virus. It invades the nervous system, and can cause total paralysis in a matter of hours. One in 200 infections leads to irreversible paralysis (usually in the legs). Amongst those paralyzed, 5-10% dies when their breathing muscles become immobilized (1, 2). In May 1988, the 41st World Health Assembly committed the Member States of the World Health Organization (WHO) to the global eradication of poliomyelitis by the year 2000 (resolution WHA41.28).

In 1988, polio paralyzed nearly 1000 children every day worldwide. Today, 20 yr after its inception, the Global Polio Eradication Initiative has reduced cases of polio by 99% and spared 5 million children from paralysis (3). Globally, only 4 countries remain that have never stopped polio before. The poliovirus is restricted to a handful of areas in these countries (Afghanistan, India, Nigeria and Pakistan). Rapid and significant progress towards the eradication of poliomyelitis is continuing in all countries of the Eastern

Mediterranean Region. When the global polio eradication programme was initiated, 2342 polio cases were reported from Eastern Mediterranean Region countries (EMRO) including Iran, while only 107 and 58 cases were reported in 2006 and 2007, respectively which show more than 95% decrease in number of polio cases in the Region although number of polio cases increased 2 folds in 2008 due to some conflicts in Afghanistan and Pakistan. The number of cases shows relatively regular decrease to a minimum in 2002, in the light of a well developed and efficiently performing surveillance system (4). Three countries of the Eastern Mediterranean countries, Sudan, Yemen and Somalia had been re-infected by virus originating from Nigeria, West Africa during 2004-2006.

Polio Eradication Programme in Iran

Stopping poliovirus transmission has been pursued through a combination of routine immunization and supplementary immunization campaigns which are guided by high quality surveillance (5). In the first years when the global polio eradication programme was initiated ap-

proximately 50 polio cases reported from Iran annually but the last laboratory confirmed indigenous polio case was reported in 1997, and importation of wild poliovirus from neighboring endemic countries (Afghanistan and Pakistan) was stopped in December 2000. Thus the country has remained polio-free for the past 8 yr (3, 6, 7).

The existence of an excellent primary health care system based on health houses, health posts, and rural and urban health centers which is accessible to more than 95% of total population, is a cornerstone for the achievement and maintenance of polio eradication in Iran. Routine Immunization against Polio has been mandatory since 1984. The routine OPV3 has reached and maintained coverage of close to 100% since 2002.

Supplementary immunization activities (SIAs) including NIDs, Sub-NIDs and mopping up operations have been crucial to the success of polio eradication in the country. During the first NID in 1995 (2 round with one month apart) 500000 youth volunteers mobilized to carry vaccine to every house in the country. Ten million children were vaccinated on a single day on each round. Highly organized and well-implemented NIDs have been held 1994-1998 (8). Since 1997 sub-NIDs have been carried out in high risk areas every year for prevention of re-emergence of wild polio virus due to circulation of virus in Afghanistan and Pakistan and risk of importation of poliovirus from these endemic countries.

A robust surveillance system for Acute Flaccid Paralysis (AFP) reporting in Iran has been established since 1991. The AFP polio performance indicators have been improved since that time, remarkably. One of the most important indices for AFP surveillance performance is non-polio AFP rate which must be more than 1 in 100000 under 15 yr population. This index always has been more than 1 in Iran and has further increased to 3.2 per 100000 in 2007. Completeness of routine reporting and active surveillance in the years 2006 and 2007 was

99.5% and 99% respectively, with more than 80% adequately collected stool samples since 2001. Virological classification was introduced in 1995 (9). The School of Public Health, Tehran University of Medical Sciences hosts the national polio lab. Phase one of laboratory containment of wild poliovirus is finished. Four laboratories were found to hold wild poliovirus material or potentially infectious materials and after that 3 of them destroyed their collections and now just one site (Razi Institute for Vaccine Production) has maintained specimens of wild polio virus (6, 8). As of 2008, national polio lab has detected 6 cases of vaccine derived polio virus in immunodeficient patients (10).

Conclusion

The National Certification Committee (NCC) has submitted its annual reports on certification of poliomyelitis eradication to the Regional Certification Commission (RCC) since 1998. The Documentation for Certification was accepted by the 9th RCC meeting in October 2002. The RCC agreed that all WHO polio eradication strategies were implemented properly and that: "the polio-free status in the country has been maintained. The existing of sensitive surveillance system, high coverage of routine immunization and the special programme to vaccinate high risk groups will guard against importation and circulation of wild poliovirus in Iran. In addition existence of the updated plan of action for detection and response to wild poliovirus importation is adequate for early detection and timely response to any event related to the possible importation of poliovirus in the country". During the period 2003-2005 the NCC has continued to submit Annual Reports to the RCC for its review and approval. The "Final Documentation for Certification of Poliomyelitis in Iran" was approved by RCC in April 2006 (3).

References

1. Plotkin SL, Orenstein WA (2004). *Vaccines*. Philadelphia: saunders, pp. 651-705.

2. Gerald L Mandell, John E Bennett, Raphael Dolin (2005). *Principles and practice of infectious diseases*, Sixth edition, Chchurchill Livingstone, 1: 149-60.
3. WHO (2006). Poliomylitis Eradication in the Eastern Mediterranean Region, Progress Report 2006.
4. WHO-EM/POL/350/E/06.07/1500WHO (2004). Progress towards global poliomyelitis eradication: preparation for the oral poliovirus vaccine cessation era. *Wkly Epidemiol Rec*; 79: 349-56.
5. WHO (2005). Progress towards interruption of wild polio virus transmission, January 2004 to March 2005. *Wkly Epidemiol Rec*, 80:149-55.
6. Final National Documentation for Regional Certification of Poliomylitis Eradication, submitted to WHO/EMRO on 26 Feb 2006, Center of Disease Control publication, Ministry of Health and Medical Education, Tehran, Iran:2006
7. WHO (2002). Expanding contributions of the Global Laboratory Network for Poliomylitis Eradication. *Wkly Epidemiol Rec*, 77:133-37.
8. Revised and updated National Documentation for Certification of Poliomylitis Eradication, submitted to WHO/EMRO on 13/8/2002, Center of Disease Control publication, Ministry of Health and Medical Education, Tehran, Iran: 2002.
9. WHO (2004). *Polio laboratory manual*, 4th edition. Geneva: WHO/IVB/04/10. pp. 11-16.
10. Zahraei SM, Gouya MM, Esteghamati A, et al (2007). Endgame of polio eradication initiative and OPV adverse event; a case report, *I J Infect Dis Tropical Med*, 11(35): 7-11.