

Case Report

Epidemiological Investigation of a Case of Diphtheria

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Abstract

A five year old female child presented with fever, throat pain and swelling in neck region and was clinically diagnosed as a case of diphtheria and confirmed microbiologically. An epidemiological investigation was conducted, which revealed that the child had received no vaccine against diphtheria. She was managed with antibiotics, anti-diphtheritic anti-sera, DPT and other necessary vaccines as required under UIP. Five other children from the same school were also identified to be suffering from similar complaints during the same period. All the children were tracked and rapid search for any other similar cases was conducted. History of partial/incomplete immunisation among the close contacts was also obtained and their chemoprophylaxis with oral erythromycin was ensured through government functionaries. No other case of diphtheria has since been reported from this area. This report highlights the steps that need to be adopted for prompt epidemiological investigation of infectious diseases in collaboration with public health authorities to achieve the optimum desired results.

Key words : Epidemiology; immunization; DPT vaccine

Introduction

Even after 32 years of the adoption of the Expanded Programme on Immunisation, there is failure to achieve satisfactory vaccine coverage to protect children from diphtheria [1]. Various studies carried out over last three decades in this country reported that diphtheria occurs more frequently during the months of August to November [2]. The persistence and resurgence of diphtheria in recent years have also been reported in various parts of the country [3]. As per report of WHO/UNICEF, 2004; the estimated DPT-3 coverage among children in India has dropped from 71% in 1995 to 64% in 2004 [4]. The Integrated Disease Surveillance Project does not have detail information on any infectious disease of public health importance in India with the sole exception of poliomyelitis [5]. Thus case-based disease surveillance has to become a part of modern Universal Immunisation Programme.

Report of case

We are reporting herewith an epidemiological investigation led by faculty from Community Medicine department, of a five year old female child

from village Kilupurampakkam, District Villupuram, Tamil Nadu suffering from diphtheria. The child was referred by a local private doctor on 11th September, 2009 to Paediatric out-patient department of Pondicherry Institute of Medical Sciences (PIMS) and admitted at midnight with history of fever, throat pain and swelling in neck region since one week. On admission the child was lethargic, febrile and had oral ulcers with foul smelling breath. She was pale, normal weight for her age, and had bilateral cervical lymphadenopathy with whitish membrane over bilateral tonsillar fossa. She was provisionally diagnosed as suffering from Diphtheria. Throat swab was positive for *Corynebacterium diphtheriae gravis*. She was given injectable penicillin and other supportive treatment along with anti-diphtheria serum to which she developed anaphylactic reaction, which was managed appropriately.

The child belonged to a lower-middle class family. Her father was unemployed since last two months. She had attended a house warming function five days before onset of symptoms where she came in contact with relatives and friends. The child had received immunisation against polio (zero and pulse

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dose twice), and Japanese encephalitis at school last year. Apart from this she had not received any other vaccine under National Immunisation Schedule. A visit was paid to her school (St. Xavier's Matriculation school, Villupuram located 56 kms away from PIMS) for contact tracing. Five other children including three from the same class-section were identified as remaining absent for 5-7 days in preceding week. Their parents were contacted telephonically and apprised about the possibility of contracting diphtheria by their children. The Principal and class teachers of the school were informed about possibility of similar other cases in the school and neighbourhood. Similar visits were paid by the investigating team in the surrounding villages to detect any such cases and possible source of infection, but no such case was detected. Telephonic enquiries from relatives also revealed similar replies.

The detailed case investigation report was communicated to Director of Health and Family Welfare, Govt. of Puducherry as well as to Deputy Director of Health Services (DDHS), Villupuram district. It is noteworthy that coverage of DPT vaccine was 88.3% in 2007-08 (DLHS-3) in the reporting area [6]. The DDHS through Municipal Health Office, Villupuram immediately took actions to detect any such other cases with history of incomplete immunisation and/or similar clinical history in the area. Throat swab of all the contacts in the school and neighbourhood including suspect class-mates were negative for diphtheria. The child was immunized with all necessary vaccines and chemoprophylaxis to all other contacts was ensured with oral erythromycin. This rapid search for any other cases viz. possible source of infection and response measures in the form of complete immunisation of other partially or unimmunised children and provision of chemoprophylaxis was conducted utilizing local Auxillary Nurse Midwives (ANM), anganwadi workers (AWW) and visiting all schools in the neighbouring villages. The DDHS instructed the ANMs and AWWs to urgently report any partially or unimmunised child whenever encountered for necessary action. The Director (Health), Puducherry highly appreciated the epidemiological case investigation process and circulated the investigation report as a model for emulation by all the medical colleges in Pondicherry. Since then not a single case of diphtheria has been reported from our hospital as well as the neighbouring areas.

Discussion

This report concentrates on the surveillance of epidemic prone infectious diseases that pose an important public health threat especially in developing countries. They include plague, cholera, meningococcal meningitis, dengue, Japanese encephalitis, influenza, diphtheria, etc. These diseases are difficult to track and manage because of their rapid spread, high morbidity and mortality, and ability to develop new strains [7]. Case based surveillance may prove to be very useful in addition to detailed epidemiological information on all epidemic prone diseases, proper entomological surveillance and information on rapid antigenic variation especially in view of influenza-like outbreaks under the existing surveillance programmes [5]. This report highlights that timely intervention by health care providers are required to prevent and effectively contain possible outbreaks of epidemic prone infectious diseases, consequently minimising the impact of their morbidity and mortality pattern.

Key Points

- The aim of this communication is to sensitize the medical fraternity especially the faculty of Community Medicine departments for their active involvement and participation in epidemiological investigations of diseases of public health importance in collaboration with administrative medical and public health authorities for optimum outcomes.
- Sincere efforts should also be made by public health authorities to improve the DPT vaccine coverage at village level to prevent such sporadic cases in future.

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