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ORIGINAL ARTICLE

RE-EMERGENCE OF PERTUSSIS : A CASE REPORT WITH PUBLIC HEALTH RESPONSE

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ABSTRACT

INTRODUCTION : Pertussis (whooping cough) pose a public health challenge, particularly in infants, who are at high risk for severe disease and complications. Early diagnosis in neonates is often difficult due to atypical clinical presentation. A 15-day-old male child presented with symptoms consistent with pertussis, including cough, breath-holding spells, and cyanosis. Diagnosis was confirmed by PCR test, which was positive for the IS481 and ptxS1 genes of Pertussis. The child showed clinical improvement after azithromycin treatment, and chemoprophylaxis was given to close contacts. Public health interventions like active case search, vaccination drives, and health education, were implemented to control pertussis transmission. No additional cases were identified during the active case search. This report emphasizes the need for healthcare providers to consider pertussis as a differential diagnosis in neonates with cough and breathing difficulties, and highlights the effectiveness of prompt treatment and public health interventions in controlling pertussis transmission.
KEYWORDS : Vaccine Preventable Diseases (VPDs), Whooping Cough, Public Health Interventions, Vaccination.

INTRODUCTION

Pertussis, or whooping cough, is a striking reminder that diseases considered rare or historical can still emerge unexpectedly and demand continuous vigilance. In 2018, the World Health Organization (WHO) reported 151,074 pertussis cases globally. Based on 2008 data WHO estimated that there were 89,000 deaths. An estimated 24.1 million pertussis cases and 160,700 deaths in children younger than 5 years have been reported worldwide.

Despite its well-documented history, pertussis remains a pertinent diagnosis in contemporary medicine. When assessing patients with cough, clinicians typically focus on common causes like allergies or any common infections to severe problems like tuberculosis, or malignancies. Pertussis often gets overlooked.

Considering pertussis as one of differential diagnosis, facilitates prompt identification and treatment, highlighting the need for broad consideration of potential aetiologies and sustained clinical awareness. Infants under one year of age have the highest incidence of pertussis, with the majority of severe cases and complications occurring in this age group.[1]

Available evidence highlighted the importance of monitoring pertussis trends and implementing control strategies to protect vulnerable population.[1] As reported incidence of Pertussis among new born was rare, we considered possibility of documenting the case study.

CASE REPORT

This 15-day-old male neonate presented with cough and breathing difficulty. A comprehensive history was obtained from the parents, relatives, Village Health Nurses (VHNs), other field staff, and healthcare workers from the hospital where the child was born. In addition, the obstetrician and pediatrician who attended the delivery were interviewed.

The child was initially treated with cough suppressants at multiple private hospitals in Karaikudi. Despite treatment, the condition worsened with recurrent episodes of cough, breath-holding spells, and cyanosis. The neonate was subsequently referred to a medical college hospital and later admitted to a private hospital in Madurai, where he was treated for ten days. Due to persistent symptoms, the child was referred to the Institute of Child Health (ICH), Egmore, Chennai, for specialized management.

The antenatal history was uneventful. The child was delivered at term by caesarean section due to fetal distress. Birth-dose vaccinations were administered, and developmental milestones were appropriate for age. There

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was no history of contact with tuberculosis or pertussis cases and no significant travel history. During the same month, 40 deliveries occurred at the birth hospital. Five neonates were referred to higher centers for non-respiratory conditions. None of the other new born developed respiratory symptoms. Among 30 healthcare workers, none reported symptoms suggestive of pertussis or required sick leave.

On admission to the private hospital in Madurai, the neonate was alert with stable vital signs. Bilateral crepitations were noted on chest auscultation. Laboratory investigations revealed mild leukocytosis with lymphocytic predominance, while renal and liver function tests and serum electrolytes were within normal limits. Imaging showed mild aspiration pneumonitis and a patulous gastroesophageal junction. The child was provisionally diagnosed with pathological gastroesophageal reflux disease with breath-holding spells, and airway anomalies such as laryngomalacia and tracheoesophageal fistula were considered. The child was referred to ICH, Egmore

At ICH, a multidisciplinary team evaluated the child. Tuberculosis and structural airway abnormalities were ruled out. Pertussis was subsequently suspected, and two nasopharyngeal swabs were collected and tested at the State Public Health Laboratory. Polymerase chain reaction (PCR) testing confirmed Bordetella pertussis, with positivity for the IS481 and ptxS1 genes.

The child was treated with azithromycin and showed clinical improvement, with reduction in cough severity, stable vital signs, and adequate weight gain. Four household contacts received azithromycin as chemoprophylaxis. The 45-day routine immunization was administered at ICH. The child was discharged with advice for exclusive breastfeeding, regular weight monitoring, completion of chemoprophylaxis for contacts, and follow-up at the Vaccine Preventable Diseases outpatient department after one month.

Public Health Investigation and Response

An active case search was conducted in Kandramanikam village, the child's place of residence, by ten teams comprising VHNs and Mid-Level Health Providers (MLHPs). House-to-house surveys, school surveys, and Anganwadi surveys were carried out to identify suspected pertussis cases.

The case definition used was cough lasting more than two weeks with or without paroxysms of coughing, inspiratory whoop, post-tussive vomiting, or apnoea in any age group. Information regarding locked houses was obtained from neighbours, and revisits were scheduled. Permanently locked houses (locked for more than one month) were excluded. Children under seven years of age were line-listed, and vaccination status was verified using Mother and Child Protection Cards.

On April 13, 2025, a total of 215 households across five streets were surveyed, covering 116 children under 16 years of age. No additional suspected pertussis cases were identified during house-to-house, school, or Anganwadi surveys. A vaccination drive was conducted in the village, during which 39 children under seven years of age received the DPT vaccine and were observed for 30 minutes post-vaccination. Chemoprophylaxis with azithromycin was administered to 20 close contacts for five days, and completion of the course was ensured. Health education sessions focusing on cough etiquette, hand hygiene, and prevention of respiratory infections were conducted in the community, schools, and Anganwadi centers.

DISCUSSION

This case report highlighted the importance of considering pertussis in infants with cough and breathing difficulties, particularly in those under one year-old. The 15-day-old child presented with symptoms. The symptoms presented, including cough, breath-holding spells, and cyanosis, were consistent with those reported in other studies and were specific for infants according to WHO guidelines.[6]

The findings of this case are consistent with observations reported in several earlier studies describing pertussis in young infants. Castillo et al. reported that infants younger than one year constituted the majority of laboratory-confirmed pertussis cases requiring hospitalization, with apnea and cyanosis being common presenting features rather than classical whooping cough (4). Similar clinical patterns were observed in this case, where apnea and cyanosis were prominent and led to multiple referrals before definitive diagnosis.

Del Valle-Mendoza et al. documented that pertussis in hospitalized infants was frequently misdiagnosed during the early phase of illness, often being attributed to bronchiolitis, pneumonia, or gastroesophageal reflux disease.[5] This mirrors the clinical course in the present case, where the neonate was initially managed for pathological gastroesophageal reflux and breath-holding spells before pertussis was suspected.

Nasopharyngeal samples from the child tested positive for the IS481 and ptxS1 genes, confirming Bordetella pertussis infection. Previous studies have demonstrated that real-time polymerase chain reaction (PCR) is a rapid and highly sensitive diagnostic method, particularly in patients

with cough illness of ≤3 weeks' duration. Although bacterial culture remains the diagnostic gold standard due to its high specificity, PCR offers superior sensitivity and faster turnaround time. Both culture and PCR have been shown to exhibit reduced sensitivity beyond the second week of cough onset.[7] The diagnostic specificity of IS481 and IS1001 PCR targets has been extensively evaluated, with no reported cross-reactivity outside the Bordetella genus, underscoring the reliability and accuracy of PCR-based diagnosis.[8]

The public health interventions implemented in this investigation including active case search, vaccination drives, and community health education were consistent with World Health Organization recommendations and played a critical role in preventing further transmission.[3] Vaccination efforts helped protect vulnerable populations, particularly infants and young children, while health education reinforced the importance of cough etiquette, hand hygiene, and respiratory infection prevention measures.

A limitation of this case report is the inability to identify the probable source of infection, which restricted insights into transmission dynamics. Nevertheless, this case emphasizes the need for healthcare providers to consider pertussis in the differential diagnosis of neonates presenting with cough and respiratory distress, enabling timely diagnosis, appropriate management, and effective public health response.

CONCLUSION

This case highlights the importance of maintaining a high index of suspicion for pertussis in neonates presenting with cough and respiratory distress. Early recognition, laboratory confirmation through PCR, and prompt initiation of antibiotic therapy are essential to reduce morbidity and prevent severe complications. Chemoprophylaxis of close contacts and active case finding play a critical role in limiting household and community transmission. Vaccination remains the most effective preventive strategy; ensuring timely completion of the primary DPT series protects infants from severe disease. Additionally, maternal vaccination during pregnancy can provide passive immunity to neonates, offering protection during the vulnerable early weeks of life. Strengthening routine immunization programs, implementing catch-up vaccination, and conducting outbreak-response immunization campaigns are vital components of pertussis control. Combined with health education on cough etiquette, hand hygiene, and infection prevention, these measures are crucial to safeguard infants and reduce the public health burden of pertussis.

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