PARVOVIRUS B19 AS A CAUSE OF NEONATAL PERTUSSIS-LIKE SYNDROME
Yenidoğanda parvovirüs B19'un neden olduğu boğmaca benzeri sendrom

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Özet: *Parvovirüs B19 birçok değişik hastalığa neden olmaktadır. Son yıllarda Parvovirüs B19 enfeksiyonunun neden olduğu klinik bulguların artması, bu virüsü daha da önemli hale getirmiştir. Servisimizde paroksizmal öksürük nedeniyle yatan yirmiyedi günlük yenidoğan kız hastaya, boğmaca benzeri sendrom tanısı konuldu. Hastamızın kültür ve serolojik testleri boğmaca benzeri sendroma neden olabilecek mikroorganizmalar ve Bordetella Pertussis için negatif idi. Parvovirüs B19 serolojisi pozitif olarak tesbit edildi. Yazımızda Parvovirüs B19'un da boğmaca benzeri sendroma yol açabileceğine dikkat çekildi.*

Anahtar Kelimeler: *Parvovirüs B19, insan; Yenidoğan*

Abstract*: Parvovirus B19 induces a broad spectrum of diseases. Increasing awareness of the clinical manifestations of B19 infection makes parvovirus B19 an emerging virus. We report a twenty-seven day-old girl with pertussis-like syndrome. Culture and serological studies for Bordetella Pertussis and any other microorganisms were negative except for parvovirus B19. We emphasize that parvovirus B19 may be an etiologic factor for pertussis-like syndrome.*

Key Words: *Newborn; Parvovirus B19, human*

Parvovirus B19, discovered in 1975 by Cossart et al. is a single stranded unenveloped DNA virus (1). Subsequent studies of its effects in humans have identified this virus as being able to induce a broad spectrum of diseases. Parvovirus B19 mainly causes asymptomatic infection, erythema infectiosum, arthropathy, erythrocyte aplasia and intrauterine infections (2-3).

Pertussis in neonates occurs more commonly than is recognized (4). Other than Bordetella Pertussis, many agents may also cause pertussis-like syndrome (5-9). Acute respiratory diseases (ARD) due to parvovirus B19 infection can be observed relatively frequently in children but to date there has been no report of a neonate with pertussis-like syndrome caused by parvovirus (10). In this case study, we discuss a neonate with pertussis-like syndrome in whom parvovirus B19 virus was determined to be the etiological agent.

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Case Report

A twenty-seven day-old girl was admitted to hospital for persistent paroxysmal coughing episodes, which had begun three days prior to the time of admission. The mother stated that at the beginning of her illness, the baby had coryza-like symptoms with a mild dry cough. Then, the frequency and severity of the cough increased and spells of paroxysmal coughing were noticed. The baby experienced ten to fifteen episodes of coughing, each of which resulted in the infant becoming blue. Paroxysmal cough was worse at night and she vomited during or after paroxysm. Her mother had a previous history of coughing for fifteen days.

At the time of admission the baby was cyanotic and tachypneic. Sternal and intercostal retractions and grunting on expiration were seen. On auscultation bilateral breath sounds were diminished. Fine

crackles could be heard in all zones. The remainder of the physical examination was normal.

The laboratory investigations revealed hemoglobin of 12.4 g/dl, hematocrit of 37 %, and a white cell count of 52,100/mm^3. The peripheral smear showed relative lymphocytosis but no eosinophilia and normochromic-macrocytic erythrocyte morphology. C-reactive protein was 35 mgr/L. Chest X-ray showed bilateral infiltration. Blood and deep nasopharyngeal cultures were negative for respiratory bacteriae (Streptococcus pneumonia, Haemophilus influenza, Moraxella catarrhalis, Staphylococcus aureus, Klebsiella pneumonia). Culture of nasopharyngeal aspirate for Bordetella pertussis on chocolate agar and Bordet-Gengou agar medium was also negative.

In serological study (ELISA-virion), the patient's serum IgM titer was positive and Ig G titer was negative for human parvovirus B19. Serological studies, Ig G and Ig M (ELISA) for other agents leading to respiratory diseases [Mycoplasma (euruimmun), Chlamydia (euroimmun), respiratory syncytial (novum), adeno- (euroimmun), influenza (virotek), para-influenza (virotek) viruses] were negative.

The baby was treated initially with antibiotics. However, there was no favorable clinical response and the baby was monitored. During her therapy, she was provided with adequate nutrition and hydration. Humidified oxygen therapy was given by head box and secretions were suctioned. At the end of three weeks, the number, severity, and duration of episodes had diminished.

Our patient was discharged after 28 days. At the time of discharge, respiratory distress and paroxysmal cough had subsided. Physical examinations were normal.

DISCUSSION

Parvovirus B19 causes erythema infectiosum, a condition which has long been described. It is also sometimes called "fifth disease" from historical enumeration of the rash diseases of childhood, or "slapped cheek disease" because of the facial rash. Its distinctive feature is the red cheeks, with circumoral pallor. On the rest of the body it is a lacy, pink macular rash that fades quickly, but may reappear after a warm bath (3).

Increasing awareness of the clinical manifestations of B19 infection makes parvovirus B19 an emerging virus. Parvovirus B19 is known to cause asymptomatic disease, erythema infectiosum, arthropathy, aplastic crisis, chronic anemia, idiopathic thrombocytopenic purpura, transient erythroblastopenia, neurological diseases, rheumatologic diseases, vasculitis, arterial occlusive disease, angio-edema, glomerulonephritis, hepatitis, petechial “glove and sock” syndrome and respiratory diseases (2,3,10-16).

Manifestations of parvovirus B19 are usually influenced by the patient's immunologic and hematologic status. In the normal host, parvovirus infection can be asymptomatic or can result in erythema infectiosum or arthropathy. Patients with underlying hematologic and immunologic disorders who become infected with this virus are at risk for aplastic anemia (3).

Fetal parvovirus infection may manifest itself in several ways, namely as hydrops fetalis, fetal or congenital anemia, abortion, stillbirth or as an asymptomatic self-limiting episode (2,12,16). Studies of parvovirus B19 IgM-positive pregnant women have shown that less than half the infected women showed signs of rash (16).

The virus is spread by exposure to airborne droplets from the nose and throat of infected people. Approximately one week after exposure, an intense viremia develops, which is associated with flu-like symptoms. The viremia lasts several days and is followed by an IgM response, which develops rapidly after infection and persists for up to 6-8 weeks. IgG serves as a marker of past infection. Determination of IgM is the best marker of recent or acute infection; seroconversion of IgG in paired

sera can also be used to confirm recent infection. The IgG probably persists for life. Life long immunity most likely occurs after infection, even though IgG levels may drop (17).

Persistent cough in infants is a medical problem with different therapeutic options depending on etiology. Increased knowledge of the incidence of various possible causative microbial agents is therefore important.

Bordetella Pertussis is a major etiologic agent of prolonged cough during childhood in unvaccinated populations (5). Paroxysmal coughing is the primary symptom in the clinical diagnosis of pertussis. Nevertheless, it has been previously suggested that pertussis-like coughing can also be observed during infections with other microorganisms, such as adenovirus, parapertussis virus, parainfluenza viruses, respiratory syncytial virus, cytomegalovirus, Mycoplasma and Chlamydia pneumoniae (5-9). Ever since Rich suggested that viruses could be involved in pathogenesis of pertussis syndrome (18), investigators have incriminated several types of viruses in the etiology. Earlier reports have described children with clinical pertussis or a pertussis-like illness that were shown to have adenovirus infections (5). Later, several reports have stressed the frequency of concurrent infections with both Bordetella pertussis and adenoviruses, whereas other investigators have reported the occurrence of viral infections other than adenovirus in the pertussis syndrome, particularly respiratory syncytial virus and cytomegalovirus (5). Wesley reported that of 44 children with clinical pertussis 29 (66 %) had serological evidence of concurrent infection with respiratory viruses or Mycoplasma pneumonia. The most common superinfection was by Mycoplasma (32%), followed by respiratory syncytial virus (27 %) and adenovirus (16 %). The high prevalence of viral infections, many being multiple, supports the theory that pertussis predisposes to such infections or vice versa (6). Hagiwara reported an epidemic of a pertussis-like illness caused by Chlamydia pneumoniae (9). Hallender et al. found that of 115 children with clinical pertussis Bordetella pertussis, the most commonly found etiological agent with whooping cough-like symptoms. Similar symptoms can be caused by Mycoplasma pneumonie, Chlamydia pneumonie and Bordetella parapertussis, and co-infections may be present (8). Wirsing von Konig et al in their report of a study of 149 children with clinical pertussis reported that most common etiologic agents were adenovirus, parainfluenza viruses, Mycoplasma pneumoniae, and respiratory syncytial virus (7). Wiersbitzky et al. have reported acute obstructive respiratory diseases in infants and children associated with parvovirus B19 infection et al. (10).

The presentation and clinical course of our patient was consistent with a diagnosis of pertussis-like syndrome. Culture and serological studies for Bordetella pertussis and other viruses were negative except for parvovirus B19. Our patient's presentation was different from acute obstructive respiratory disease described by Wiersbitzky. We claim that parvovirus B19 is an etiologic factor for pertussis-like syndrome. In conclusion, we believe parvovirus B19 infection should be considered in the differential diagnosis of pertussis-like coughing. Therefore, future scientific studies of pertussis-like syndrome in early childhood should include a test for parvovirus B19.

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