



Diagnosis of Measles Progressing to Meningitis and Pneumonia in Newborns: A Case Report

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Abstract

Introduction: Measles is a highly transmissible viral disease that can lead to serious complications, especially in newborns and infants. This case report describes a 5-month-old female pediatric patient diagnosed with measles in the first month of life, which progressed to encephalitis and meningitis. **Objective:** To report the diagnosis and management of serious complications of measles in an infant, highlighting the progression to encephalitis, meningitis and their respiratory and nutritional consequences. **Case Report:** The patient was seen complaining of abdominal pain at the São Joaquim Family Health Strategy, in Belém, Pará. Pathological history included a diagnosis of measles in the first month of life, which progressed to encephalitis with loss of consciousness and mental confusion. Exams revealed intracranial hemorrhage and meningitis, leading to admission to the Santa Casa pediatric ICU for 3 months. During hospitalization, she developed dysphagia and pneumonia due to broncho aspiration, and was fed through a gastrostomy tube for the last three weeks. At the consultation, the patient was in good general condition, with general physical examinations without significant pathological findings. Current treatment included Phenobarbital and Levetiracetam. Paracetamol was prescribed and laboratory tests were ordered for further evaluation. **Conclusion:** The case highlights the severity of measles complications in newborns, with progression to encephalitis, meningitis and respiratory and nutritional complications. The importance of vaccination, multidisciplinary monitoring and family support are crucial for the management and prevention of such complications.

Keywords: Measles; Encephalitis; Meningitis; Dysphagia; Gastrostomy

Introduction

Measles is a classic childhood pathology. It is an acute and self-limited disease, which has a high transmission rate [1]. Its etiological agent is an RNA virus, belonging to the Paramyxoviridae family and a member of the Morbillivirus subgroup [1]. Humans and monkeys are the only two known hosts of the disease.

Measles is transmitted through nasopharyngeal secretions expelled when coughing, sneezing, speaking or breathing. Due to its dispersion in aerosols, with viral particles in the air, transmission increases in closed environments, such as schools, daycare centers and clinics [1,2].

Measles is relatively rare in the first six months due to transplacental transfer of maternal antibodies [2]. Therefore, the question arises about maternal immunization.

The most effective prevention is through vaccination. The first dose is administered at 12 months of age and has a two-dose schedule for effective immunization, the other dose must be given at 15 months, and the SCR vaccine or the combined SCR-V (tetraviral) vaccine can be used. The minimum interval between doses must be 30 days. The MMR vaccine, in addition to measles, includes mumps and rubella [1,2].

Due to outbreaks or exposure to children, the immunization known as “zero dose” is advisable, which can be applied from 6 months of age. The “zero dose” is not actually included in the vaccination schedule, and even after its application, the child must maintain two doses against the disease for immunization [2,3].

Care for the mother and child, from pregnancy to post-birth, is an important pillar in Primary Health Care (PHC). In its most current definition, PHC is a complex organizational structure to meet social demands linked to the Family Health Strategy [3]. Regarding specialized care for children, the Ministry of Health proposed the National Policy for Comprehensive Child Health Care (PNAISC) [3].

The PNAISC, established by Ordinance No. 1,130, of August 5, 2015, has as its pillars the Promotion and monitoring of growth and integral development, comprehensive care for children with illnesses prevalent in childhood and chronic diseases. Therefore, it is the duty of health agents to periodically monitor the child, from pregnancy to adolescence. Monitoring includes checking the vaccination record at all appointments [2,3].

Therefore, this present study aims to report a case of measles in the first month of life, as well as the follow-up and subsequent prognoses for the case.

Case Report

Pediatric patient, female, 05 months old, was seen at the São Joaquim Family Health Strategy, in Belém, Pará, on 04/14/2023. The mother reported that the child complained of abdominal pain. In the pathological history, the person in charge mentioned that the patient was diagnosed with measles in the first month of life.

The primary course of measles progressed to encephalitis, a serious complication associated with the disease. Encephalitis was characterized by loss of consciousness and mental confusion, with a potential risk of progression to death. Due to the severity of the condition, the patient was admitted to the Santa Casa pediatric ICU, where she underwent a lumbar puncture to analyze the cerebrospinal fluid. The results indicated intracranial hemorrhage and meningitis.

The ICU stay lasted 3 months. During this period, the patient developed dysphagia, resulting in bronchoaspiration and subsequent pneumonia. Currently, the patient is fed through a gastrostomy tube (GTM), which was inserted three weeks ago. The mother observed that in the last three days the child has been crying easily and showing abdominal strain.

Current treatment includes Phenobarbital, 20 drops at night, and Levetiracetam, 0.1 ml every 12 hours. In the general physical examination carried out at the consultation, the patient was in good general condition, active and reactive, normal colored and hydrated, weighing 9,800 grams. No significant pathological findings were found.

On cardiac auscultation, the heart sounds were normophonetic and rhythmic in two beats. Respiratory auscultation revealed bilateral breath sounds without changes. Abdominal physical examination showed a visible umbilical hernia, with no signs of complications. The gastrostomy showed no signs of infection or inflammation.

Medical management included prescribing paracetamol to control pain and requesting additional laboratory tests for additional evaluation.

Discussion

Measles, although commonly considered a self-limited childhood disease, can predispose to the development of severe comorbidities, including neurological and respiratory complications. In this case report, a 5-month-old pediatric patient developed serious complications after an initial diagnosis of measles in the first month of life, demonstrating the severity that the disease can reach in unimmunized newborns.

Among the most serious complications of measles, encephalitis is a central concern [4,5]. It is a neuro-inflammatory inflammation, usually viral, that can arise when the virus directly affects the central nervous system (CNS) or compromises the efficiency of the immune system. Post-measles encephalitis is characterized by mental confusion, lethargy and reduced level of consciousness, with high fever ($\geq 38^{\circ}\text{C}$), leukopenia and electroencephalogram abnormalities as secondary criteria [4,5].

In the reported case, encephalitis led to the need for

urgent intervention in the pediatric ICU, where lumbar puncture revealed intracranial hemorrhage and meningitis, indicating that the infection extended from the brain structures to the meninges [4,6,8,9]. This situation highlights the close relationship between encephalitis and meningitis in viral infections, both involving neurological inflammation, but in different locations [6,7]. Meningitis can manifest with persistent systemic symptoms and additional neurological signs, such as tremors, speech disturbances and involuntary movements [5-7,10,11].

The development of dysphagia and subsequent bronchoaspiration in the patient is a critical complication with a direct impact on nutrition and respiratory function. Dysphagia, often found in critically ill patients, increases the risk of aspiration pneumonia due to the loss of the airway protective reflex. Gastrostomy has been indicated to ensure adequate long-term nutrition, a vital procedure for children unable to ingest sufficient calories orally [12-14].

Gastrostomy, although beneficial, presents risks of complications such as infections in the surgical wound, which can progress to sepsis or peritonitis [15,16]. Continuous and prophylactic monitoring is essential to prevent serious infections. Early tube migration and the formation of gastrocolic fistulas are other complications that may arise, requiring strict medical attention.

The patient is being treated with Phenobarbital and Levetiracetam to control seizures associated with encephalitis and meningitis. Phenobarbital is a barbiturate with sedative and anticonvulsant properties, raising the threshold for seizures and preventing new episodes. Levetiracetam, although its mechanism of action is not completely elucidated, is effective in preventing partial and generalized seizures, being administered as an oral solution to children.

Preventing such serious complications emphasizes the importance of vaccination against measles and other infectious diseases. The recommended vaccination schedule, which includes triple viral (SCR) or tetraviral (SCR-V), must be strictly followed to ensure effective immunization [17-20]. Furthermore, meningitis is an immediately notifiable disease, requiring health professionals to report suspected or confirmed cases within 24 hours in the Notifiable Diseases Information System (SINAN) [10,11,21-23].

Conclusion

This case highlights the complexity and severity of complications associated with measles in neonates, especially in unimmunized patients. Encephalitis and meningitis, as neurological complications, and aspiration pneumonia due to dysphagia, illustrate the need for rapid and effective medical interventions. Ongoing multidisciplinary management, including neurological monitoring and adequate nutritional support, is crucial to optimize clinical outcomes and prevent additional complications.

Competing interests

The authors declare that they have no competing interests.

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