

Special Article - Infectious Diseases

Utility of Peripheral Smear in Rapid Diagnosis of Pertussis

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Received: August 10, 2018; Accepted: August 20, 2018; Published: August 27, 2018

Clinical Image

A 1 month- old girl with no prior illness, presented to the emergency department for cough and shortness of breath. The blood analysis revealed an increased peripheral white blood cell count with lymphocytosis: WBC: $28,19 \times 10^9/L$ (75% lymphocytes, 21% neutrophils, 2,7% monocytes, 0,4% eosinophils and 0,2% basophils); hemoglobin level was 10,8 g/dL and platelet count was $518 \times 10^9/L$. Biochemistry was normal including normal C - reactive protein. Because of the leukocytosis and lymphocytosis, on the bases of the rules set to morphological evaluation with Cellavision system, a peripheral blood smear was automatically performed. Morphologic evaluation of the peripheral blood smear revealed numerous mature lymphocytes with scant cytoplasm, condensed chromatin, and clefted nuclei, characteristic of *Bordetella pertussis* lymphocytosis. On the basis of these findings and then of this clinical suspicion, a real time PCR was performed on a respiratory sample that was positive for B pertussis and Rhinovirus. The patient was treated with azithromycin and cortisone showing a progressive clinical improvement. Pertussis, an acute illness of respiratory and infants in pre-vaccination age are the most vulnerable group with the highest rates of morbidity and mortality. The clinical presentation can be atypical and the disease

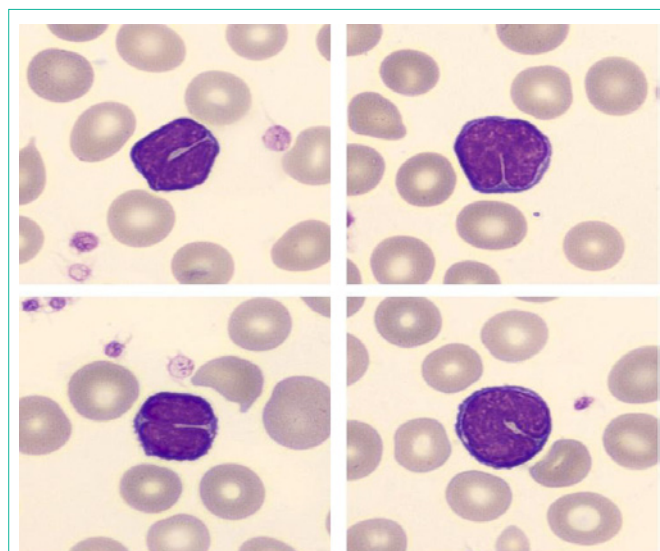


Figure 1: Small mature lymphocytes with deep nuclear clefts, characteristic of *Bordetella pertussis* infection. Giesma stain of peripheral blood smear (x1000).

is often misdiagnosed. Analyzing culture is the gold standard for diagnosis but this takes a few days. Polymerase chain reaction is a rapid and more sensitive test but it is not available in all hospitals. Studies of pertussis in children show absolute lymphocytosis in >50% of patients, and characteristic small, mature lymphocytes with hyperchromatic, cleaved nuclei may account for as much as 56% of total lymphocytes. Therefore the presence of these lymphocytes can provide a strong diagnostic suspicion. This case emphasizes the utility of peripheral blood smear evaluation as a diagnostic tool until other results become available or when more sophisticated diagnostic methods are not available.