



# Lymphocyte morphology supports early diagnosis of *Bordetella pertussis* infection in neonates

Daniele Bonacina<sup>1\*</sup> , Sabrina Buoro<sup>2</sup>, Anna Paola Callegaro<sup>2</sup> and Mirco Nacoti<sup>1</sup>

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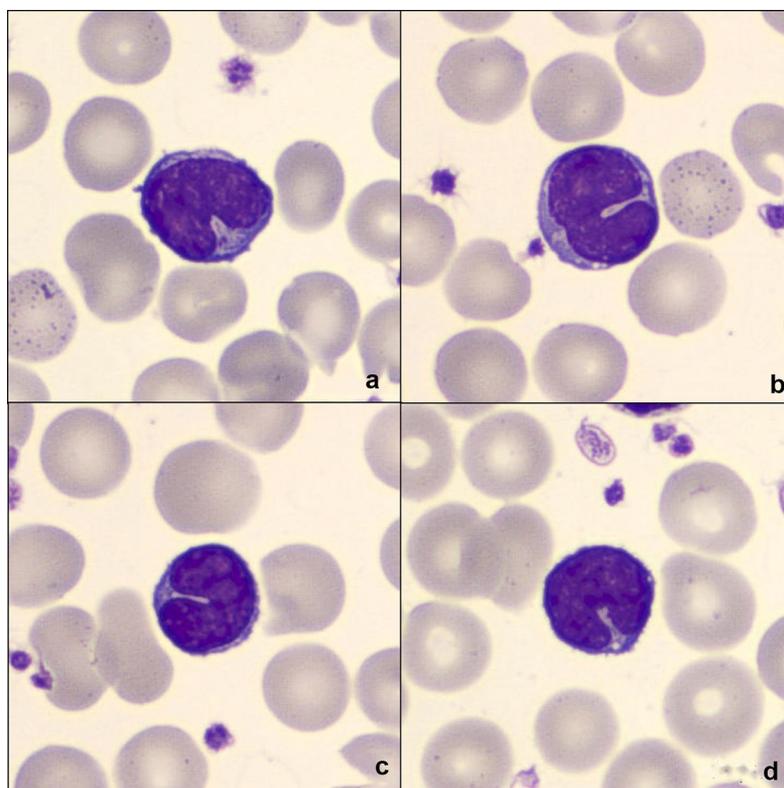
A 42-day-old infant was admitted to our pediatric intensive care unit (PICU) for respiratory distress. The complete blood count analysis showed an important lymphocytosis ( $38.48 \times 10^9/L$ ); the peripheral blood smear evaluation revealed small and deeply clefted lymphocytes with mature chromatin morphology suggestive of *Bordetella pertussis* infection (Fig. 1a–d). Azithromycin was started. Two days later microbiologists confirmed the diagnosis by real-time polymerase chain reaction (PCR). The infant was supported with invasive mechanical ventilation and extracorporeal membrane oxygenation (ECMO) because of the persistence of severe hypoxia

and pulmonary hypertension; nevertheless, he developed progressive multiorgan failure and died on the 5th day following admission.

*Bordetella pertussis* is a vaccine-preventable cause of infectious disease, often unrecognized, with a high mortality in infants worldwide, even in areas with high immunization coverage. Severe cases present extreme leukocytosis, refractory hypoxemia, and pulmonary hypertension with a fulminant course: despite ECMO support, mortality remains as high as 70%. Recent findings suggest that pre-ECMO leukodepletion may confer a survival advantage. The recognition of the typical

\*Correspondence: dbonacina@asst-pg23.it

<sup>1</sup> Department of Anesthesia and Intensive Care, Pediatric Intensive Care Unit, ASST Papa Giovanni XXIII, Piazza OMS 1, 24127 Bergamo, Italy  
Full author information is available at the end of the article



**Fig. 1** Peripheral blood smear reveals small, mature lymphocytes with scant cytoplasm, condensed chromatin and clefted nuclei

lymphocyte morphology in the blood smear suggests an early diagnosis, requiring a molecular assay confirmation, and supports a prompt treatment of this severe disease.

#### Author details

<sup>1</sup> Department of Anesthesia and Intensive Care, Pediatric Intensive Care Unit, ASST Papa Giovanni XXIII, Piazza OMS 1, 24127 Bergamo, Italy. <sup>2</sup> Department of Laboratory Medicine, ASST Papa Giovanni XXIII, Bergamo, Italy.

#### Author contributions

MN designed the report; SB and APC collected the images; DB wrote the paper.

#### Compliance with ethical standards

#### Conflicts of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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