

Megakaryocytes in Neonatal Peripheral Blood Smears

Yenidoğan Periferik Yaymasında Megakaryositler

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To the Editor,

Megakaryocytes (MKs) account for 0.01% of all nucleated cells in the bone marrow [1]. Recent studies show that MKs play an important part in platelet production, inflammation, and immune function. As an "omnipotent" cell type, MKs participate in regulating coagulation, inflammation, and immunity [2]. MKs in peripheral blood smears (PBSs) may indicate hematological neoplasms, such as myelodysplasia, granulocytic leukemia, or other myeloproliferative disorders [3]. MKs are more rarely observed in the PBSs of patients with non-hematological diseases, including Sheehan's syndrome, lumbar disc herniation, and hypertension [4].

A total of 411 newborn infants admitted to Qingdao Women and Children's Hospital Affiliated to Qingdao University from January 2024 to May 2024 were enrolled in this study. They were 0 to 30 days old. Here, we report on 80 cases of MKs discovered on the feathered edges of the PBSs of these 411 infants (Figure 1). Three to five PBSs were prepared for each infant to detect MKs, which were confirmed with blinded assessments by two experienced experts. The median age of the infants was 4 days (range: 0 to 30 days) and 44 of them were boys. Thirty-four of these patients were diagnosed with hyperbilirubinemia, and all 34 of these patients had negative neonatal hemolysis test results. Furthermore, 20 were premature. Seventeen of the patients were admitted to the hospital because of infections, including pneumonia, enteritis, intrauterine infections, and perinatal infections. Ten were healthy, whereas some had multiple symptoms. Among the remaining 331 children without MKs, 80 were randomly selected as controls for the sake of the analysis. The baseline characteristics of the infants with and without MKs in PBSs are summarized in Table 1.

The number of infants with MKs in PBSs was higher than that of infants without MKs in PBSs among the following disease categories: hyperbilirubinemia, premature birth, anemia, hypoglycemia, thrombocytopenia, sclerema neonatorum, and hypoxemia. The causes of MKs in peripheral blood may be related to these diseases or other unknown disorders. It was previously demonstrated that erythropoietin (EPO) could stimulate EPO receptors presenting on erythroid precursors and MKs in the bone marrow of patients with anemia [5]. Moreover, an increase in thrombopoietin during thrombocytopenia may promote MK differentiation. Both of these factors may cause an increase in MKs in PBSs. In the present study, five patients with MKs in PBSs were diagnosed with anemia, whereas four without MKs in PBSs had anemia. Three patients with and two without MKs in PBSs were diagnosed with thrombocytopenia. According to previous reports, 20%-25% of MKs derived from the bone marrow migrate to pulmonary capillaries. Lefrançois et al. [6] found that platelets were generated in the lungs of MK-specific PF4-Cre transgenic mice. MKs in the peripheral blood may thus originate from pulmonary capillaries and the lungs may have hematopoietic potential.

In conclusion, circulating MKs are common in newborns. While the clinical significance of MKs in neonatal PBSs is not yet clear, they may indicate the presence of hyperbilirubinemia, premature birth, anemia, or other diseases mentioned in this letter.

Keywords: Megakaryocytes, Neonatal peripheral blood, Hyperbilirubinemia

Anahtar Sözcükler: Megakaryositler, Neonatal periferik kan, Hiperbilirubinemi

Table 1. Baseline data of 80 infants with and 80 infants without megakaryocytes in peripheral blood smears analyzed in this study.			
Characteristic		Number from among 80 infants with MKs	Number from among 80 infants without MKs
Age, median, days		4	7
Sex	Male	44	48
	Female	36	32
Diagnostic results	Hyperbilirubinemia	34	16
	Premature birth	20	17
	Infection	17	32
	Healthy	10	22
	Neonatal asphyxia/respiratory distress syndrome	9	20
	Low birth weight	7	20
	Anemia	5	4
	Hypoglycemia	5	1
	Respiratory failure	4	11
	Thrombocytopenia	3	2
	ABO hemolytic disease	3	5
	Pneumothorax	1	1
	Granulocytopenia	1	1
	Intracranial hemorrhage	1	5
	Sclerema neonatorum	1	0
	Hypoxemia	1	0
MKs: Megakaryocytes.			

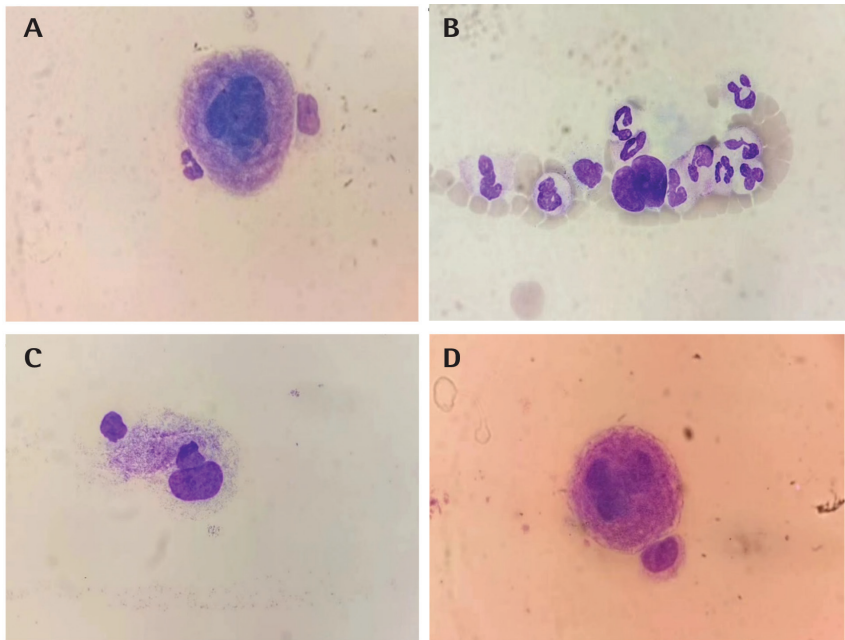


Figure 1. Megakaryocytes found in neonatal peripheral blood smears, including granular megakaryocytes and naked megakaryocytes (magnification 1000×, Wright-Giemsa staining).

Ethics

Informed Consent: Written informed consent was obtained from each participant's guardians.

Footnotes

Authorship Contributions

Surgical and Medical Practices: X.L., Z.W.; Concept: X.L., Z.W.; Design: X.L., Z.W.; Data Collection or Processing: X.L., Z.W.; Analysis or Interpretation: X.L., Z.W.; Literature Search: X.L., Z.W.; Writing: X.L., Z.W.

Conflict of Interest: No conflict of interest was declared by the authors.

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