Circulating Monocytes Phagocytosing Lymphocytes in Small-cell Variant of T-cell Prolymphocytic Leukemia

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November 13, 2023
December 28, 2023

Keywords: Circulating monocytes, Phagocytosis, Small-cell variant, T-cell prolymphocytic leukemia, Flow cytometric analysis

To the Editor,

A 66-year-old man was admitted because of wheezing after physical activity for one month. Physical examination showed multiple enlarged lymph nodes in the neck, axilla, and groin, and the largest one was about 4 cm × 1.5 cm. The liver was palpable 7 cm below the right subcostal margin and the spleen 10 cm below the left. The patient developed abdominal distention and decreased breath sounds in the right lung without tenderness or rebound pain. A complete blood count showed remarkable leukocytosis (white blood count, 317.96 × 10^9/L) with 98% abnormal mature lymphocytes, hemoglobin concentration of 111 g/L, and severe thrombocytopenia (platelets, 23 × 10^9/L). Other laboratory results indicated elevated levels of lactic dehydrogenase (LDH, 1232 U/L) and β2-microglobulin (6.36 mg/L). Chest computed tomography (CT) revealed hepatosplenomegaly and right-sided pleural effusion with atelectasis of the right lung, and the pleural effusion showed a high level of LDH (4877 U/L) and adenosine deaminase (ADA, 24.2 U/L).

Peripheral blood smear revealed small mature lymphocytes with clumped chromatin, regular nuclei, invisible nucleoli, and scant basophilic cytoplasm (Figure 1a-d). Strikingly, monocytes engaging in phagocytosis of lymphocytes were observed, showing nuclear condensation and scant cytoplasm (Figure 1a-c), along with occasional cocci with both intracellular and extracellular monocytes (Figure 1c-d). The phagocytosis was not seen in bone marrow. Flow cytometric analysis of bone marrow aspiration demonstrated the lymphocytes positive for CD3, CD4, CD2, CD7 (bright), CD5, CD45RA, and TRBC1, and negative for CD8, CD10, CD25, CD30, CD45RO, CD56, CD57, CD279 and TCRγδ. Similar morphological features and immunophenotyping of abnormal cells in pleural fluid were identical to the marrow samples. Cytogenetic analysis showed 46, XY,inv(9)(p12q13)[18].
Fluorescence in situ hybridization (FISH) detected TRA/D rearrangement in 83% of cells (Figure 1e-f). A diagnosis of T-cell prolymphocytic leukemia (T-PLL) (small-cell variant type) was made. The patient underwent chemotherapy with bendamustine, but there was no significant improvement. Due to economic reasons, he was discharged and the blood culture was not performed.

Very few cases with phagocytosis of lymphocytes by circulating monocytes were reported in the literature. To our knowledge, circulating monocytes are considered committed precursors for phagocytes, such as macrophages, dendritic cells, or macroglia kupffer cells. Moreover, Kovács AR et al found phagocytic activities of monocytes occur in patients with ovarian cancer. The phagocytic activity of circulating monocytes may present in cases with hematologic disorders or various infections. Coincidentally, Li T et al documented an unusual anaerobic infection in a 46-year-old man showing the presence of phagocytosis of lymphocytes by circulating monocytes on Wright-stained blood smears. Herein, the occurrence of small lymphocytes in a small-cell variant of T-PLL, as well as pleural involvement and phagocytosis of lymphocytes by circulating monocytes was extremely uncommon. In brief, we described a rare case of small-cell variant of T-PLL, presenting with pleural effusion and circulating monocytes phagocytosing lymphocytes on blood smears.

Ethics
Informed Consent: Informed consent was obtained from this patient.

Authorship Contributions
SZ, and MM made the differential diagnosis, guided the patient's treatment, and wrote this Clinical Picture. YL, YB and ZZ participated in the clinical diagnosis, analysed the clinical records, and wrote the main text. YZ and SZ guided the clinical diagnosis, revised this Clinical Picture, and assisted in preparing this case for publication.

Conflicts of Interest: Authors of this manuscript declare that no one has conflict of interest to disclose.


References
Figure 1: Peripheral blood smear revealed mature lymphocytes with clumped chromatin, regular nuclei, invisible nucleoli and scant cytoplasm (a-d, Wright-Giemsa staining, 1000× magnification). Strikingly, monocytes engaging in phagocytosis of lymphocytes were observed, showing nuclear condensation and scant cytoplasm (Figure 1a-c, black arrow indicated), along with occasional cocci with both intracellular and extracellular monocytes (c-d). Fluorescence in situ hybridization (FISH) detected TRA/D rearrangement in 83% of all cells (e-f).