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Automated analysis of pleural fluid total and differential leukocyte counts with the Sysmex XE-2100

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BACKGROUND: Determination of leukocyte (WBC) counts in pleural fluid is routinely performed by microscopic examination. In this study, we evaluated the performance of automated (differential) WBC counting in comparison with manual counting. **METHODS:** Pleural fluid samples (n=45) were obtained from patients undergoing diagnostic thoracocentesis. The manual total WBC count was determined after Samson staining in a Fuchs-Rosenthal hemocytometer; microscopic differential counts were performed on May-Grünwald Giemsa-stained cytopsin slides. The Sysmex XE-2100 hematology analyzer was used for automated (differential) WBC counting. The functional detection limit was determined by serial dilution of continuous ambulatory peritoneal dialysis (CAPD) fluid and replicate measurements of each dilution. **RESULTS:** The automated WBC count ($\times 10^6/L$) was highly correlated with that of the microscopic reference method ($r(2)=0.95$; WBC-analyzer= $0.97 \times$ WBC-reference method+16; n=45). Good agreement was also observed for the absolute lymphocyte count ($r(2)=0.92$; WBC-analyzer= $0.99 \times$ WBC-reference method+32; n=36), neutrophil count ($r(2)=0.94$; WBC-analyzer= $0.91 \times$ WBC-reference method+6; n=35), and monocyte count ($r(2)=0.73$; WBC-analyzer= $0.83 \times$ WBC-reference method+6; n=38). The functional detection limit for WBCs was calculated at $50 \times 10^6/L$ (coefficient of variation 20%). **CONCLUSIONS:** With some limitations, total and differential WBC counts in pleural fluid can be reliably determined using the Sysmex XE-2100 instrument.

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