

Joint Event

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The Abbott Alinity Hq body fluid mode accurately determines low RBC concentrations in cerebrospinal fluid

Introduction: Accurately distinguishing pathological cerebrospinal fluid (CSF) from normal specimens requires manual counting of cells in a hemocytometer when WBC or RBC concentrations are low. Although WBC counts may be determined by dedicated body fluid (BF) modes on some hematology analyzers, no automated method that is currently available will be able to report RBC counts below 1,000 cells/ μ L.

Methods: We have investigated the performance of the prototype BF mode on the Abbott Alinity Hq hematology analyzer. Data was collected on a total of 160 CSF, pleural, peritoneal and synovial fluid samples using Alinity Hq BF mode equipped with a research use, only of software version, and with the Sysmex XN-9000 BF mode in two clinical laboratories. Total nucleated cell counts (TNCC) and RBC concentrations were also determined manually using a hemocytometer. Data were analyzed after excluding duplicates, samples run in multiple dilutions, specimens with clots or cell clumps and those with missing results (e.g. as a result of insufficient sample volume).

Results: There was overall good correlation between Alinity Hq and Sysmex XN-9000, TNCC and RBC were $r=0.90$ and 0.96 , respectively, when excluding samples with RBC count of 0 (i.e. less than 1,000/ μ L) on the Sysmex instrument. Optimal correlation ($r=1.00$) was obtained between manual and both automated TNCC methods, and a slight positive bias was observed with Passing-Bablok regression (slope= 1.24 and 1.11 with Alinity Hq and Sysmex XN-9000, respectively). Strong correlation was achieved between manual RBC counts and the Alinity Hq and Sysmex XN-9000 RBC counts on the 48 samples with a manual RBC concentration of $>1,000/\mu$ L ($r=0.97$ and 0.98 , and slope= 1.19 and 1.05 , respectively). Of the 71 samples with manual RBC count of $<1,000/\mu$ L, Sysmex XN-9000 was unable to report a result in 47 cases and reported 1000 and 2000 cells/ μ L, respectively, on 19 and five of the specimens. Alinity Hq accurately quantitated RBC in these samples, achieving a correlation coefficient of 0.93 , and a slope of 1.29 in comparison with the manual RBC count, and reported <10 RBC/ μ L in 19 samples out of the 20 with manual RBC count of $<10/\mu$ L. Additionally, results were analyzed separately on the 26 CSF specimens in the cohort. TNCC counts showed a high level of correlation with the manual count ($r=0.98$ and 0.99 with slope= 1.10 and 0.96 for Alinity Hq and Sysmex XN-9000, respectively). Sysmex XN-9000 was unable to report RBC results on all but on one CSF specimen, while Alinity Hq demonstrated a high degree of accuracy ($r=1.00$ and slope= 1.19) when compared to the manual RBC count.

Conclusion: The Alinity Hq BF mode is a promising alternative to manual cell counting in CSF and other body fluids with low cell counts.

Biography

Zainab Mukhtar is working as a Global Manager, Medical and Scientific Affairs for Abbott Hematology based in Abbott Delkenheim office in Germany. She is a Medical Physician, specialized in Hematology Blood Transfusion and Transplantation Medicine from Bristol University, UK. More than 16 years of her Post-graduate experience includes hematology and blood bank laboratory management, clinical management of hematology and transfusion dependent patients of various hematological disorders. She is a Consultant for Hematology and Blood Transfusion Projects in various countries. She has also been trained at Paul Ehrlich Institute in Langen, Germany for licensing and marketing authorization of blood and biologicals.

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