Introducing immature granulocytes (IG) in a proficiency testing program as a new parameter on automated hematology analyzers

Andrew McFarlane1,2; Anna Johnston1,3; Gini Bourner4; Tracy Martin5; Ruth Padmore6

1Quality Management Program—Laboratory Services (QMP–LS), Toronto, ON, Canada; 2Institute for Quality Management in Healthcare (IQMH), Toronto, ON, Canada; 3Gamma-Dynacare Medical Laboratories, Brampton, ON, Canada; 4HealthSciences North/Horizon Santé-Nord Ramsey Lake Health Centre, Sudbury, ON, Canada; 5Ottawa Hospital-General Campus, Ottawa, ON, Canada

Introduction

With advances in technology automated hematology analyzers have several new parameters available for improving laboratory workflow and optimizing the reporting of patient results. One of these parameters is immature granulocytes (IG), which includes metamyelocytes, myelocytes and promyelocytes, but not bands cells or myeloblasts (Figures 1–4). The detection of immature granulocytes may reflect an unexpected physiologic state that warrants further investigations. Elevation of the IG may be indicative of sepsis, inflammation, trauma, cancer, metabolic abnormalities or myeloproliferative neoplasm.

Objectives

The Quality Management Program—Laboratory Services (QMP–LS) provides external quality assessments/proficiency testing programs for medical laboratories. In 2012, a patterns-of-practice survey was conducted by QMP–LS to determine current practice for reporting IG in Ontario in order to include this parameter in the proficiency testing program.

Methods

An online survey was distributed to 182 participants. The questions addressed the implementation of the reporting of IG including the validations performed before reporting, determination of accuracy, bias and precision, and training for interpretation prior to reporting patient results. Subsequent to this survey, a pilot was performed for assessment of the IG count separately from the granulocyte count in a routine hematology proficiency testing survey.

Results

Of 182 participants, 31 (17%) reported that they had determined the clinical validity and verified accuracy/bias, and 21 (11.5%) reported that they determined precision of the IG parameter on the hematology analyzers. Only 17 (9%) reported that they currently include immature granulocytes in the patients’ reports. Of the 17, 2 were the Abbott Cell-Dyn 4000/Sapphire analyzer, and 5 were the Beckman Coulter LH 800, only which provide flagging of IGs, and 10 were Sysmex instruments, including XE-2100i/2100C/5000i and XT-2000i analyzers which enumerate IG. The immature granulocyte (IG) count was included as a reporting parameter for the participants using Sysmex instruments with the capability of enumerating immature granulocytes (IG), resulting in a 6-part differential. Separate counts were to be reported for absolute IG and absolute granulocyte (Table 1). For the pilot survey, of 198 participating laboratories, 38 Sysmex users had capability performing the IG count and were asked to provide the IG value for assessment. The results of the IG counts were all within allowable performance limits (±0.2 × 10^9/L). (Table 2).

Conclusions

The reporting of new parameters poses challenges to proficiency testing since some laboratories are reporting and others are not. It is the responsibility of individual laboratories to ensure appropriate validations for any new parameter reported from automated hematology analyzers (such as the IG count).2,3 Laboratories should not only understand the clinical utility of these new parameters, but also potential sources of error and limiting factors prior to reporting. In addition, laboratories should provide proper notification and education of the clinical utility for these new parameters to the health care providers ensuring appropriate treatment is provided to patients based on the correct interpretation of laboratory results.3,4 The IG parameter will continue to be included in future QMP–LS proficiency testing surveys.

References


3. ISO 15189:2012(E). Medical laboratories—Requirements for quality and competence. Medical laboratories—Requirements for quality and competence

