

# Platelet interference in automated reticulocyte counting

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Medicine has gone through an admirable improvement due to the arsenal of resources offered by scientific advancement, what allows for prolongation of life and the enhancement of its quality. Among these resources, laboratory tests stand out, exerting considerable impact on medical decisions. New tests have continuously been made available, many times replacing older ones, and the enhancement of many traditional tests make them still invaluable for diagnosis and the treatment of numerous diseases.

A long-established procedure remains irreplaceable in medical practice: reticulocyte quantification. At an intermediate stage between orthochromatic erythroblasts and erythrocytes, reticulocytes are still important indicators of bone marrow erythropoietic activity, highlighting not only possible blood loss or hemolysis (or even response to treatment), but also the failure present in medullary hypoplasia and other conditions<sup>(1)</sup>. Formerly restrict to suspect cases of non-evident chronic bleeding and hemolytic processes only suspected, the quantification of these components became part of the routine demand among other additional tests. That was because of the urgent need to use this resource for decisions in both medical care and occupational medicine, on account of myelotoxicity risks from activities in the areas of petrochemistry and steel industry.

In the middle of the 1990s, methods of automated reticulocyte count became a reality in clinical laboratories. This characterized an important technical evolution contrasted with the visual count under optical microscopes using supravital staining. The flow cytometry count displayed high precision, mainly for the large quantity of analyzed cells. Specificity, however, turned out to be not ideal, as the component indicator of reticulocytes – ribonucleic acid (RNA) – is also found in other formed elements of blood – leukocytes and platelets<sup>(2,3)</sup> –, as well as in parasitic organisms occasionally present<sup>(4,5)</sup>. With a view to improving analytical accuracy, human-provided care is essential: the visual control by an experienced observer, who analyzes graphs generated in flow cytometer and takes the necessary actions in suspect cases. However, variations associated with leukocyte and platelet numbers, besides any other possibilities of interference<sup>(6)</sup>, must be taken into consideration.

In this issue of *Jornal Brasileiro de Patologia e Medicina Laboratorial (JBPML)*, Viana *et al.* (2016)<sup>(7)</sup> demonstrated the positive interference of platelets in reticulocyte count by flow cytometry with the use of thiazole orange. The results yielded in the comparative study – whether or not removing platelets as a cause of interference due to the presence of cytoplasmic RNA – indicate one of the aspects to be worked on for the improvement of analytical specificity of reticulocyte automated count.

Enjoy your reading!

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## REFERENCES

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1. McPherson RA, Pincus MR. *Henry's clinical diagnosis and management by laboratory methods*. Philadelphia: Elsevier; 2011.
2. Kim A, Park J, Kim M, et al. Correction of pseudoreticulocytosis in leukocytosis samples using the Sysmex XE-2100 analyzer depends on the type and number of white blood cells. *Ann Lab Med*. 2012; 32(6): 392-8. PubMed PMID: 23130337.
3. d'Onofrio G, Kim YR, Schulze S, et al. Evaluation of the Abbott Cell Dyn 4000 automated fluorescent reticulocyte measurements: comparison with manual, FACS and Sysmex R1000 methods. *Clin Lab Haem*. 1997; 19(4): 253-60. PubMed PMID: 9460566.
4. Wu AHB. *Tietz clinical guide to laboratory tests*. 4 ed. St. Louis: Saunders; 2006.
5. Laurencet FM, Martinez T, Beris P. Spurious extreme reticulocytosis with an automated reticulocyte analyzer. *N Engl J Med*. 1997; 337(26): 1922-3. PubMed PMID: 9417531.
6. Zandecki M, Genevieve F, Gerard J, Godon A. Spurious counts and spurious results on haematology analysers: a review. Part II: white blood cells, red blood cells, haemoglobin, red cell indices and reticulocytes. *Int J Lab Hematol*. 2007; 29(1): 21-41. PubMed PMID: 17224005.
7. Viana KA, Martins Filho AO, Dusse LMS, et al. Evaluation of the interference of platelets in reticulocyte counting by flow cytometry using thiazole orange. *J Bras Patol Med Lab*. 2016; 52(3): 142-8.