

3rd International Conference on Nephrology & Therapeutics

June 26-27, 2014 Valencia Conference Centre, Valencia, Spain

Functional iron deficiency: A diagnostic challenge for the laboratory

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The diagnosis of iron deficiency or functional iron deficiency is particularly challenging in patients with chronic kidney disease, because most of the biochemical markers for iron metabolism are affected by acute phase reaction. For these reasons, interest has been generated in the use of erythrocyte and reticulocyte parameters, available on the modern Hematology analyzers. Reported during blood analysis routinely performed on the instrument, these parameters can assist in early detection of different clinical conditions without additional cost. Modern analyzers report new parameters that provide further information from the traditional count, but these new parameters are exclusive of each manufacturer and they are patented. Hypochromic red cells and reticulocyte Hemoglobin content reported by the Siemens analysers reflect iron availability, are included on diverse guidelines for management of anemia, as reliable markers of functional iron deficiency. Similar parameters are now reported by CELL-DYN Sapphire analyzer (Abbott Diagnostics); extended parameters, calculated for each individual red cell, estimate the cellular volume and Hemoglobin concentration. Symex XE 5000 analyzer reports the percentages of hypochromic red cells and reticulocyte Hemoglobin equivalent. Recent studies confirm their clinical reliability as markers of iron deficiency in hemodialysis patients. Low Hemoglobin density is actually available from Beckman Coulter analyzers. The meaning of these parameters and their clinical utility in the study of anemia and erythropoiesis is reviewed. Both laboratory professionals and clinicians need to keep up to date with new parameters and Laboratory methods, implying a stronger collaboration between them, to enable the diagnosis to be made rapid and accurately.

Biography

Eloisa Urrechaga is Consultant for Clinical Chemistry in the Hospital Galdakao Usansolo (Spain), responsible for Hematology Laboratory. She is an expert of the Spanish Science and Innovation Ministry and the Agency for Assessment of new technologies for research project validation. She is particularly involved in the development of new hematological parameters applied to the study of anemia and erythropoiesis as well as glycohemoglobin. Recently, she published papers in the area of automation, biological parameters in functional iron deficiency, β-thalassemia, anemia of chronic diseases and other erythropoiesis disorders, and is serving as an editorial board member and scientific reviewer in different journals.

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