Multivariate Statistical Analysis of the Relations between Erythrocyte Membrane Stability, Serum Lipids and Hematological Variables

Bernardino, M.N.¹; Avelar, E.B.Jr.¹; Arantes, T.S.¹; Jordão, I.A.¹; Huss, J.C.C.¹; Theodoro-de-Souza, T.M.¹; Souza-Penha, V.A.¹; da Silva, S.C.¹; Alves-de-Souza, P.C.¹; Tavares, M.²; Penha-Silva, N.¹

¹ Institute of Genetics and Biochemistry, ² Faculty of Mathematics, Federal University of Uberlândia, Uberlândia, MG, Brazil

The observation that the membrane fluidity must remain within a critical interval outside which the stability and functionality of the cell tends to decrease, shows that the stability, fluidity and function are related and that the measure of erythrocytes stability allows inferences about the fluidity or functionality of these cells. The test of osmotic fragility of erythrocytes provides three parameters to measure stability: dX, H50 and dX/H50. These parameters enable us to relate various hematological and biochemical variables with erythrocyte fluidity or functionality and, consequently, to associate these variables to the risk of disease. This study determines the biochemical and hematological variables that are directly or indirectly related to the stability of erythrocyte through those parameters and how they relate to each other, besides knowing what are the most significant variables. For this, we measured the erythrocytes stability parameters and correlated them with various hematologic and biochemical variables for 71 patients. These data were mathematically treated by simple correlation and multivariate statistics. The erythrocytes stability showed a greater association with hematologic variables than the biochemical ones. The Red Cell Distribution Width (RDW) stands out for their strong and significant correlation, and freedom of influences. For the biochemical variables the erythrocytes stability was more sensible to LDL-C. Erythrocyte stability is significantly associated with RDW and LDL-C. Thus, the level of LDL-C is a consistent link between stability and functionality, suggesting that the measure of erythrocyte stability may be one indirect way of assessing the risk of vascular diseases.

Key Words: erythrocyte, stability, lipidemia, hematimetry

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