Are Storage Time and Temperature Critical Pre-Analytical Factors in Biochemical Analysis of Pleural Fluids?


Introduction: Biochemical analysis is the first laboratorial approach to classify and to diagnose pleural effusions. The standardization of all steps from sample collection to laboratorial procedures is fundamental to guarantee results reliability. However, there are few reports in literature about pre-analytical factors which could interfere with the biochemical analysis of pleural fluids (PF).

Objectives: To evaluate the influence of storage time and temperature in PF stability for biochemical analysis.

Methods: Samples of PF obtained from 30 patients were analyzed in the first two hours after the thoracocentesis (gold standard) for Proteins, Albumin, Lactic Dehydrogenase (LD), Cholesterol, Triglycerides and Glucose. In sequence, the samples were placed at room temperature (RT), in refrigerator (4º C; T4) or frozen (-20º C; FT). The same parameters were analyzed after 1, 2, 3, 4, 7 and 14 days. In seven samples, LD isoenzymes (1 to 5) were quantified.

Results: Due to LD-4 and LD-5 instability to cold, it was observed a decreasing in LD levels after 24 h and two days in frozen and refrigerated samples, respectively. All parameters, except glucose, were stable until the 4th day if samples were maintained at RT or T4.

Conclusions: Storage time and temperature can be potential factors of errors in biochemical analysis of PF. Due to glucose instability at RT, its determination should be performed as rapidly as possible after sample collection. For Proteins, Albumin, cholesterol and triglycerides, the samples remain stable if refrigerated. For routine LD analysis, the sample should be stored at room temperature because of the sensitivity of LD-4 and LD-5 to cold.