PLEURAL EFFUSION: TRANSUDATE OR EXUDATE

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Despite having been studied for 100 years, the physiology of pleural fluid formation and absorption is still controversial[1]. The most accepted concept is formation by filteration through the pleural microvascular endothelium and absorption via the stomata in the parietal pleura that drains into the subpleurallymphatics. Exudative effusions usually involve inflammation which increases the permeability of pulmonary and pleural vasculature permitting the passage of fluid with high protein content. In transudates the gradient of serum and pleural fluid is maintained because of intact vascular endothelium[2]. Distinguishing exudates from transudates is the cornerstone in the evolution of pleural effusions because exudative effusions require immediate further workup for early diagnosis as delay in treatment increases both complications and morbidity. Specific gravityand protein levels in pleural fluid were the first parameters to separate transudates from exudates. Laullen and Carr found that 72% of pleural fluids amongst congestive cardiac failure had specific gravity less than 1.016[4,5] while 73% had specific gravity more than 1.0 16 but almost 30% were misclassified. Later protein levels were found to be slightly more accurate than specific gravity[6] and a protein level of 3.0 grams was taken as the dividing line. In recent years pH measurements of pleural fluid[7] (less than or equal to 7.28), pleural fluid/serum protein ratio (less than 0.5) [8], higher serum lectate dehydrogenase levels than pleural fluid (less than or equal to 200 LU) have also been suggested to help in differentiating exudates from transudates[9]. Light et al. proposed a criteria for diagnosing exudates which included three parameters, i.e., pleural fluid to serum protein ratio of more than 0.5, pleural fluid lectate dehydrogenase levels of more than 200 units per litre and pleural fluid to serum lactate dehydrogenase ratio of above 0.6. This retrospectively designed criterion is said to be 100% sensitive in identifying exudates. Further work identified that pleural fluid to serum bilirubin ratio of 0.6 or more can also serve the same purpose and its sensitivity, specificity, positive predictive accuracy and overall accuracy are above 90% compared to Light\'s criteria[11]. Roth et al. while comparing the serum effusion albumin gradient of 1.2 g/dl or less to diagnose exudates with Light’s criteria found this to be more accurate for transudates. Though Light’s criteria exactly identified all exudates but transudates from five congestive cardiac failure patients were misclassified as exudates, four of these were treated with diuretics previously. Diuretics are known to increase protein concentration[12,13]. Roth’s serum to effusion albumin ratio correctly diagnosed all these five cases but misclassified two malignant effusion cases as transudates. The number evaluated in this study were rather small, but if these findings are confirmed in a large series, it may become a useful investigation for the diagnosis of transudates. Although Light’s criteria is very sensitive for exudates, it should be remembered that diuretic therapy can convert transudates into pscudocxudates[14] and, therefore, for the evaluation of pleural fluids, thoracentesis should be performed before the use of diuretic therapy. In fact all collections in body cavities should have a diagnostic tap to differentiate transudates from exudates before any specific therapy is initiated.

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