Pleural Fluid Polymorphonuclear Elastase: *Cui bono?*

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Pleural effusions are common in everyday clinical practice. Particularly infectious effusions (accounting for 11–40% of all pleural effusions [1]) require prompt diagnosis and treatment because delayed treatment or failure to recognize their complicated nature may result in serious complications (loculation-empyema). The appropriate classifications in that respect, including the latest [2] are not perfect, so that a number of complicated pyogenic effusions may go unrecognized or in the case of borderline parapneumonic effusions, the serial follow-up may waste precious time for intervention. Furthermore, there is the possibility of a positive pleural culture, but without a purulent appearance or a negative Gram stain, so that an early identification of complicated pyogenic effusions stands out.

Pleural fluid polymorphonuclear elastase (PMN-E), a protease from azurophilic granules of polymorphs, measured in the pleural fluid has been shown to be able to differentiate between pyogenic bacterial effusions and non-infectious ones with good sensitivity and specificity [3]. The data provided by the same group [4] and published in this issue of *Respiration* provide good evidence that a high pleural PMN-E can be useful for the early diagnosis and management of complicated pyogenic effu-

sions. Although the sensitivity for the effusions not classified with classic markers was 67% at a cutoff point of 3,500 mg/l, if PMN-E was added to the latter the sensitivity rose to 91%, while its overall specificity was 97%. Using PMN-E values, they also tried to classify severity according to the classification of Light [5], with borderline effusions having an intermediate level between complicated and uncomplicated.

The study is well designed and the conclusions are reasonable. Nevertheless, the authors did not provide any methodology with respect to this high cutoff value of PMN-E. Targeting noncomplicated parapneumonic effusions, the specificity was 85%, but the positive predictive value of this cutoff for the initially misclassified effusions was found to be lower (57%). The likelihood ratio of a positive test can be calculated to 4.37 (95% confidence interval: 2.20–8.60). Likelihood ratios have become useful because they enable to quantify the effect a particular test result has on the probability of a certain diagnosis or outcome. Using a simplified form of Bayes' theorem (posterior odds = prior odds $\times$ likelihood ratio) and estimating the pretest probability of the disease for classical markers at 53%, then we get a more than twofold increase (2.31) in the diagnostic capability of PMN-E over and above that

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of old markers for an early identification of pyogenic complicated effusions. Clearly, other useful markers are needed in that respect and further research in this area is still warranted.

Time has come to assess PMN-E in the pleural fluid in addition to the other established markers used in the differential diagnosis of pleural effusions, because of its low costs and ease of determination – apart from its critical importance as an early marker of pleural complications.

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