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Lung alert

Utility of serum and sputum calprotectin as a biomarker for CF exacerbation

Monitoring inflammation and diagnosing pulmonary exacerbation in cystic fibrosis (CF) remains difficult as the usual biomarkers of inflammation are often not very helpful and there is still no accepted definition for a CF exacerbation. This study looked at the possibility of serum and sputum calprotectin as a new biomarker for monitoring pulmonary exacerbations in CF.

It was hypothesised that serum and sputum calprotectin will change informatively during the CF exacerbation. Twenty-seven patients completed the study. Sputum was tested for calprotectin, interleukin 8 (IL-8), myeloperoxidase (MPO) and neutrophils at the beginning and the end of treatment. Serum was tested for calprotectin, white cell count, C-reactive protein (CRP) and vascular endothelial growth factor (VEGF). Case notes were reviewed a year after completion of the study to calculate the time to the next exacerbation.

Sputum calprotectin was significantly reduced ($p<0.05$) with treatment. MPO and IL-8 also decreased with treatment but the trend was not significant. In serum, calprotectin, CRP and VEGF were all reduced significantly with treatment ($p=0.002$, $p=0.002$ and $p=0.013$. respectively). Serum calprotectin and CRP were both negatively correlated with the forced expiratory volume in 1 s (FEV_1) but the correlation was much stronger for calprotectin. For a calprotectin level of ≥ 9.1 μg, the median time to the next exacerbation was 70 days, whereas for a level of <9.1 it was 112 days. CRP failed to show a difference in median time to next exacerbation with the cut-off value of 10.

This study shows that calprotectin is a better biomarker for inflammation in the CF lung and could be useful in monitoring the exacerbations and response to treatment. It can also be useful in predicting the time to the next exacerbation.

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