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Serum amyloid A in chronic obstructive pulmonary disease

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Introduction: Serum Amyloid A types 1 and 2 (SAA1, SAA2) are acute phase proteins elevated in inflammatory conditions. They are biomarkers of disease activity and participants in pathogenesis. Production is primarily hepatic, while pulmonary expression has also been reported in COPD. This project aimed to (i) study the cytokine-induced SAA transcriptional regulation in human airway related cells (ii) investigate temporal changes in serum SAA levels in stable COPD patients undergoing a 12-week pulmonary rehabilitation (PR) programme.

Methods: A pGL4.10SAA2 luciferase reporter construct, was transfected into HepG2 hepatocytes, A549 pulmonary epithelial cells and U937 monocytic cells. Following 24h the cells were stimulated with different concentrations of Il-1β, IL6, LIF and IL8. Six and 24h postincubation, promoter activity was quantified using dual luciferase reporter assays. Stable COPD patients were recruited from Mater Dei Hospital outpatients clinic, as part of a separate project, and serum SAA concentrations were analysed using ELISA.

Results: IL1β showed the highest SAA2 transcriptional regulatory activity in U937 (27.8 fold) and HepG2 (10.1 fold) cells. IL8 induced 5.7 fold activity in U937 cells, and 2.8 fold in A549. LIF was only active in A549 cells (3.0 fold). The mean SAA was 52.4±7.4µg/ml (SEM) at baseline, 76.6 ±11.3µg/ ml after 8 weeks (difference from baseline; $p<0.05$), and 56.0±9.5µg/ml at week 12.

Conclusion: Inflammatory microenvironments can induce SAA2 transcription in airwayrelated cells, with the promoter being most active in IL1β-stimulated monocytes. PRP-related changes in serum SAA were observed in COPD patients, and further studies are required to better understand the mechanisms underlying this observation.