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Amyloid Deposition in Granuloma of Tuberculosis Patients: A Pilot Study

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Abstract : Background: Granuloma formation is one of the characteristic features of tuberculosis. Besides, chronic inflammation underlying tuberculosis is often indicated by an increase in the concentration of serum amyloid A (SAA) protein. The connection between tuberculosis and SAA-driven secondary amyloidosis is well documented. However, SAA-derived amyloid deposition start sites are not well understood in tuberculosis and other chronic inflammatory conditions. It was hypothesized that granuloma could be a potential site for an amyloid deposition because both SAA protein and proteases that cleave SAA into aggregation-prone fragments are reported to be present in the granuloma. Here the authors have shown the presence of SAA-derived amyloid deposits in the granuloma of tuberculosis patients. Methodology: Over a period of two years, tuberculosis patients were screened, and biopsies were collected from the affected organs of the patients. The gold standard, Congo red dye staining, was used to identify amyloid deposits in the tissue sections of tuberculosis patients containing granulomatous structure. Results: 11 out of 150 FFPE biopsy specimens of tuberculosis patients showed eosinophilic hyaline-rich deposits surrounding granuloma. Upon Congo red staining, these deposits exhibited characteristic apple-green birefringence under polarized light, confirming amyloid deposits. Further, upon immunohistochemical staining with anti-SAA, the amyloid enriched areas showed positive immunoreactivity. Conclusion: In this pilot study, we have shown that granuloma can be a potential site for serum amyloid A-derived amyloid formation in tuberculosis patients. Moreover, the presence of amyloid gave significant cues that granuloma might be a probable amyloid deposition start in tuberculosis patients. This study will set a stage to expand the clinical and fundamental research in the understanding of amyloid formation in granuloma underlying tuberculosis and chronic inflammatory conditions.

Keywords : amyloid, granuloma, periphery, serum amyloid A, tuberculosis
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