

Serum amyloid P component (SAP) concentration in abdominal fat aspirates of patients with amyloidosis

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INTRODUCTION

Serum amyloid P component (SAP) is present in all amyloid. SAP binds to amyloid in a calcium-dependent way. Anti-SAP is used in immunohistology to study the presence of amyloid deposits. Quantitative data about the tissue concentration of SAP in living patients are lacking.

OBJECTIVE

To assess the SAP concentration in aspirated fat tissue of patients with systemic amyloidosis.

METHODS

Aspirated abdominal fat tissue was studied of 79 controls and 95 consecutive patients with systemic amyloidosis: 18 AA, 59 AL and 18 ATTR type of amyloid. Fat tissue was washed with calcium-containing TRIS buffer to remove possible remnants of blood, then washed with EDTA-containing TRIS buffer to isolate SAP from the tissue. Amyloid was extracted from the fat tissue by incubation with a TRIS-guanidin solution. The SAP concentration and amyloid A protein concentrations were measured by ELISA. Congo red-stained fat tissue smears were scored semi-quantitatively (0 to 4+).

RESULTS

The mean SAP concentration in fat of controls was 0.31 ng/mg fat tissue with a 95% confidence interval (95% CI) ranging from 0.04 to 2.48 ng/mg fat tissue. No correlation was present between SAA concentration of blood and SAP concentration of fat tissue (Figure 1).

Patients with amyloidosis had higher SAP concentrations ($p < 0.0001$) than controls: mean SAP 1.40 ng/mg fat tissue (95% CI: 0.04 - 37.5 ng/mg fat tissue). SAP values above the upper reference limit (> 2.48 ng/mg fat tissue) were present in 44 patients (46%) (Figure 2).

The ANOVA test showed a linear trend ($p < 0.0001$) between the mean SAP concentration and Congo red (CR) scores: mean SAP 0.44, 0.70, 1.0, 3.5, and 4.9 for CR 0, 1+, 2+, 3+, and 4+ respectively (Figure 3). The amyloidosis patients with SAP values above the upper reference limit increased from 0% for CR 0 to 16%, 33%, 64%, and 83% for CR 1+, 2+, 3+, and 4+ respectively.

In the group of 18 AA patients the concentrations of SAP and amyloid A protein in fat tissue correlated well ($r = 0.88$, $p < 0.0001$) (Figure 4).

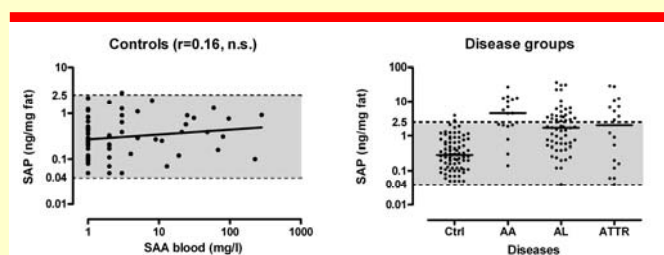


Figure 1. Blood SAA and fat SAP concentrations of controls. The grey area is the 95% CI reference range.

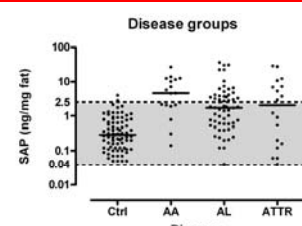


Figure 2. Fat tissue SAP content of controls and amyloidosis patients. (Grey reference range.)

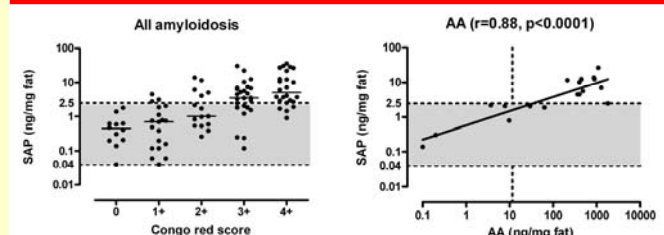


Figure 3. SAP concentrations in fat tissue of patients with amyloidosis, categorised by Congo red score. (Grey reference range.)

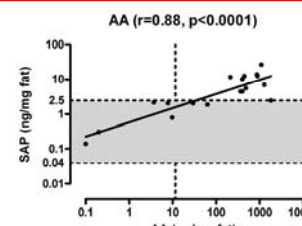


Figure 4. SAP and amyloid A protein concentrations in fat tissue of patients with AA amyloidosis. (Grey reference range.)

CONCLUSIONS

- The SAP concentration of fat tissue differs between patients with amyloidosis and controls, although with considerable overlap
- There is a good concordance between the SAP concentration and the amount of amyloid in fat tissue