Heavy/light chain analysis in 200 newly diagnosed patients with AL amyloidosis

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BACKGROUND

Detection of a free light chain lambda or kappa (the precursor of AL amyloid) or an M-protein is important in the evaluation of AL amyloidosis. Introduction of the quantitative free light chain (Freelite®) assay dramatically improved detection and follow-up of patients with AL amyloidosis.

OBJECTIVE

To study additional utility of the quantitative heavy/light chain (Hevylite®) assay to the free light chain assessment for detection of AL amyloidosis.

METHODS

Serum from 200 consecutive patients with AL amyloidosis (104 men and 96 women, median age 63, range 33-88 years) was studied using first the free light chain assay followed by the heavy/light chain assay. A positive result of an assay was defined by both an increased concentration and an abnormal ratio. Results were compared with serum protein electrophoresis, immunofixation, and urine electrophoresis.

RESULTS

Free light chain quantification identified 119 patients to have AL-lambda whereas 53 patients were identified AL-kappa (Figure 1). Ten (5%) of the remaining 28 patients (14%) had a quantifiable heavy/light protein (6 IgG-lambda, 1 IgG-kappa, 1 IgA-lambda, 1 IgA-kappa and 1 IgM-kappa) (Figures 2-4). Identical M-proteins were found in these 10 patients using serum immunofixation.

Eighteen patients (9%) were not identified using the quantitative free light chain and heavy/light chain assays. Ten of these 18 patients had an M-protein or light chain using serum immunofixation (5 IgG-lambda, 2 IgA-lambda, 1 IgM-lambda, 1 IgG-kappa, and 1 BJ-lambda) whereas 11 had a light chain or M-protein using urine immunofixation (9 BJ-lambda, 1 IgA-lambda, and 1 IgG-kappa).

No M-protein or light chain was detected in 5 patients (2.5%) whatever detection method was used.

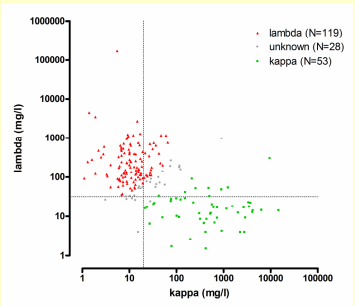

Figure 1. *Free light chain serum levels in 200 AL patients.*

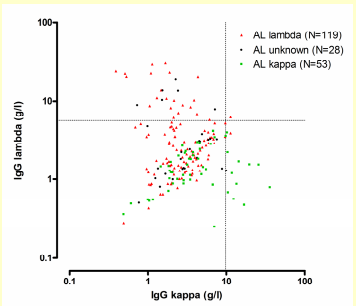

Figure 2. *IgG kappa and IgG lambda serum levels.*

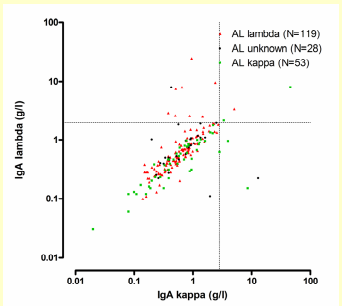

Figure 3. *IgA kappa and IgA lambda serum levels.*

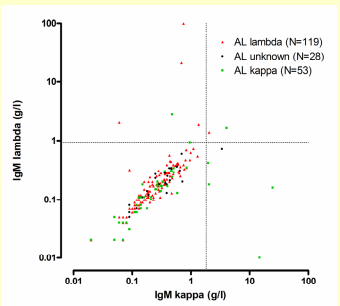

Figure 4. *IgM kappa and IgM lambda serum levels.*

CONCLUSIONS

- Free light chain quantification detects 86% of AL patients
- Heavy/light chain quantification increases detection of AL patients with 5% to 91%
- However, qualitative detection of an M-protein / light chain using immunofixation of serum and urine is still necessary to identify another 6.5% of AL patients
- Still 2.5% of AL patients are not detected by any of the methods.

GUARD

http://www.amyloid.nl