Serum levels of free kappa and lambda light chains in patients with systemic AL, AA, and ATTR amyloidosis

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INTRODUCTION

Immunoglobulin light chains are precursors of AL amyloid fibrils. Free light chains can be quantified with a recently described immunoassay.

OBJECTIVE

To study the value of serum free light chains for the diagnosis of systemic AL amyloidosis and for monitoring effects of therapy.

RESULTS

Control lower and upper 99% confidence limits were for kappa 1.50 and 77.5 mg/l, for lambda 2.54 and 144 mg/l, and for the K/L ratio 0.29 and 1.09 (see figure 1). Twenty-one (95%) AL-kappa and 50 (94%) AL-lambda patients were outside the K/L ratio reference range (see figure 2).

During follow-up of 20 AL patients the K/L ratio did not normalise in 6 (30%) AL patients, although > 50% response was seen in 4 (20%) of them. The ratio normalised transiently in 5 (25%), and normalised until the end of follow-up in 9 (45%) patients (see figure 3). The clonal response was reflected by the K/L ratio in most patients.

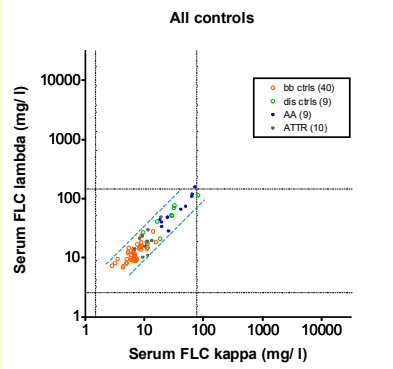

Figure 1. Control lower and upper 99% confidence limits for free light kappa, lambda, and kappa/lambda ratio in serum.

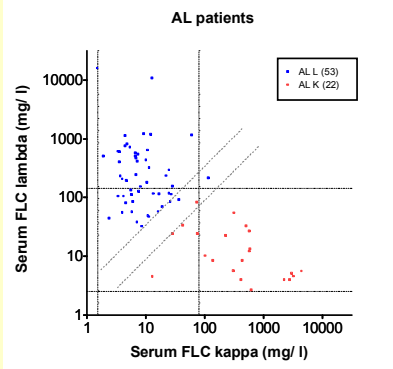

Figure 2. Serum values of free light kappa, lambda, and kappa/lambda ratio of 53 AL-lambda and 22 AL-kappa patients.

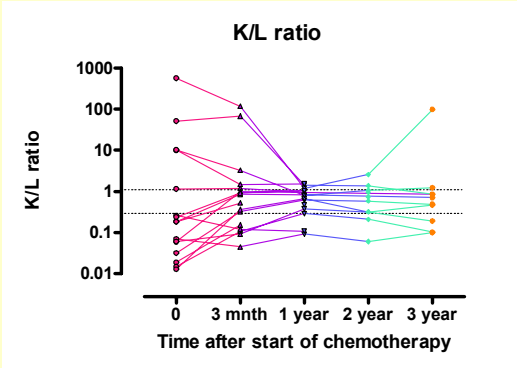

Figure 3. Free kappa/lambda ratio in serum during follow-up after start of chemotherapy in 20 patients with AL amyloidosis.

PATIENTS AND METHODS

Twenty-two patients with AL-kappa and 53 with AL-lambda amyloidosis were studied at diagnosis. Controls were 40 healthy blood donors, 9 patients with arthritis, 10 patients with AA amyloidosis, and 10 patients with ATTR amyloidosis.

Clonal responses after chemotherapy were evaluated in 20 patients with AL amyloidosis and follow-up of one year or longer.

Free kappa and lambda light chains in stored serum samples were quantified with a nephelometric immunoassay (FreeLite™) with specific antibodies raised against hidden epitopes. The 99% confidence limits of controls were calculated for kappa, lambda, and the ratio of both light chains.

CONCLUSION

- Serum free kappa and lambda light chains, and especially the ratio of both, are valuable tools to diagnose AL amyloidosis and to monitor the clonal effect of therapy

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