

Comparison of Serum Free Light Chain and Paraprotein Levels in Monoclonal Gammopathies.

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Background

Multiple myeloma (MM) is the second most common hematological malignancy after non-Hodgkin lymphoma. Diagnosis of monoclonal gammopathies (MGs) is determined by demonstration of a monoclonal immunoglobulin molecule or chain in serum and/or urine. Since 2001, the serum free light chain (FLC) test has been available and its clinical utility proven, but guidelines have not recommended it as a replacement for electrophoresis. There is no evidence about concordance between paraprotein levels and FLC measurements

Aim of study

the aim of this study is to compare the amount of the paraprotein quantified by capillary SPE with serum FLC assays, and to examine the relationship between FLC and paraprotein levels in order to determinate significance of this ratio for patient treatment and for obtaining more meaningful information from these test results.

Methods

serum FLCκ and FLCλ (sFLC) concentrations are routinely measured at the Ziv Medical center biochemistry labs by Freelite® (The Binding Site Group Ltd, UK) on a Beckman Coulter AU680 and Binding site SPA-PLUS. Paraprotein levels are measured by Sebia Capillarys 2 Instrument from serum electrophoresis and immunofixation. Correlation between paraprotein value and light chain in serum to examine the relationship between FLC and paraprotein levels in order to determinate significance of this ratio for patient treatment and for obtaining more meaningful information from these test results.

Results

A total of 503 successive serum samples with requests for detection/exclusion of serum paraproteinemia were studied. The preliminary results show us a correlation between paraprotein and FLC ratio and between paraprotein and Kappa light chain some patients whereas other show no correlation, shown in table 1.

Pearson’s correlation analyses and calculation of the correlation coefficient will be used to determine concordance between FLC and paraprotein levels. Correlation coefficient above 90% will be considered as significant results. Fig 1

Table 1: Correlations between M-Protein and Kappa, Lambda and the ratio Kappa/Lambda according to each of the patients.

Number	Myeloma type	Light chain type	Age in diag	n	1	Lambda	Ration
1	0	K	49	15	0.913***	-0.589*	0.926***
2	0	L	68	14	-0.330	-0.165	-0.472
3	0	K	69	15	0.885***	-0.630*	0.862***
4	0	L	65	16	0.571*	0.637**	-0.305
5	0	L	83	12	-0.671*	0.831**	-0.896***
6	0	K	68	7	-0.549	-0.664	0.424
7	0	K	55	51	0.905***	-0.247	0.921***
8	0	K/L	65	12	0.368	0.878***	-0.251
9	1	K	68	39	-0.193	0.075	-0.074
10	0	L	54	18	0.003	-0.112	-0.037
11	0	L	75	27	-0.792***	-0.694***	0.180
12	0	K	74	32	0.869***	-0.798***	0.943***
13	0	K	70	35	0.729***	0.415*	0.894***
14	0	K	56	26	0.824***	-0.409*	0.268
15	0	K/L	78	21	-0.291	0.313	-0.263
16	0	K	81	36	0.838***	-0.355*	0.897***
17	0	K	50	26	0.794***	-0.429*	0.722***
18	0	L	75	13	0.106	0.233	-0.178
19	0	K	72	42	0.752***	-0.442**	0.423**
20	0	K	69	29	0.674***	-0.471**	0.925***
21	0	K	67	13	-0.592*	-0.357	-0.138

Heavy and light chain myeloma 0

Free light myeloma 1

<0.05, **p<0.01, ***p<0.001

Discussion & Conclusions

We found good agreement between methods for MM response assessment, but the FLC test analysis was more sensitive than the paraprotein evaluation during follow-up in monoclonal gammopathy patients. To our Knowledge, this is the first report comparing FLC and paraprotein levels and ratio for response assignment based on the International Myeloma Working group guidelines.

We reported on patients that have different patterns of paraprotein secretion in different types of heavy and light chains MM.

Assessment the concordance or discordance between FLCκ, FLCλ or FLCκ/FLCλ and Paraprotein levels can be useful tool in monoclonal gammopathies diagnosis, follow-up and treatment. In the future we will try to find the reasons for the non correlation patterns and examine the prognosis of these patient group.

Fig. 1:Examples for Correlations between M-Protein and Kappa/Lambda Free light chain in some patients

