BRIEF COMMUNICATION

IDENTIFICATION OF MONOCLONAL IMMUNOGLOBULINS BY IMMUNOFIXATION ELECTROPHORESIS - SOME QUESTIONS

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Summary: In the series of 2413 paraproteins analyzed by immunoelectrophoresis during 30 years, doubled paraproteinemias were found 42 times, i.e. a frequence of 1.7%. In last two years we have found 202 paraproteins by means of immunofixation electrophoresis and within this group multiple paraproteinemias was found 21 times, i.e. a frequence of 10.4%.

Key words: *Monoclonal immunoglobulin; Immunofixation; Multiple paraproteinemias*

Over nearly the last 30 years the standard investigation method for the identifying of monoclonal immunoglobulins (paraproteins) was based upon electrophoresis of serum proteins and in case positive M-gradient a subsequent immunoelectrophoresis. Now, electrophoretic systems of a high quality, for example using agarose as a dividing medium, are able to identify small M-gradients in concentrations of about 1g/l. Immunoelectrophoresis in clinical laboratories has lately been practically fully replaced by immunofixation (1,2). Immunofixation makes possible a reliable definition of the paraprotein class and antigen type of light chains as well as in „small" paraproteins 1g/l concentration. The presence of M-protein in the blood serum and/or in urine is relevant for a clinician, but it is not clear whether the detection of very low levels (< 1g/l) of paraprotein is clinically useful (3).

The high sensitivity of immunofixation (about 10 times higher than that of immunoelectrophoresis) leads not only to the identifying the small paraproteins but also the oligoclonal gradients. From time to time we are faced with the dilemma, of whether the gradient should be evaluated as monoclonal or oligoclonal.

In the series of 2413 paraproteins analyzed by immunoelectrophoresis in the years 1967-1995 doubled paraproteinemias were found 42 times, i. e. a frequence of 1.7 % (tab. 1). In the last two years we have found 202 paraproteins by means of immunofixation electrophoresis and within this group multiple paraproteinemias (2-3 paraproteins in the serum of one person) were found 21 times, i. e. a frequence of 10.4 % (tab. 2 and 3). Immunofixation reveals that multiple paraproteinemias are more frequent than had been assumed.

Immunofixation makes the evidence of „ladder" effect easier to detect when the monoclonal light chains are typed

Tab. 1: Immunoglobulin classses in 2413 cases of paraproteinemia (detection of paraproteins by immunoelectrophoresis).

Paraprotein	n	%	kappa	lambda	non detected
IgG	1540	63,8	854	545	141
IgA	396	16,4	225	138	33
IgM	302	12,56	172	85	45
IgD	10	0,4	1	9	-
Light chains	122	5,0	70	52	-
Gamma HCD	1	0,04	-	-	-
Double paraproteins	42	1,7	-	-	-

Tab. 2: Immunoglobulin classses in 202 cases of paraproteinemia (detection of paraproteins by immunoelectrophoresis).

Paraprotein	n	%	kappa	lambda
IgG	128	63,36	78	50
IgA	22	10,9	10	12
IgM	21	10,4	17	4
IgD	1	0,5	1	-
Light chains	9	4,45	7	2
Double paraproteins	21	10,4	-	-

Tab. 3: Multiple paraprotinemias in 202 cases of paraproteinemia (Detection by immunofixation).

Paraprotein	n	Paraprotein	n
IgG-kappa + IgG-lambda	5	IgG-lambda + IgM-kappa	1
IgG-kappa + IgA-lambda	2	IgG-kappa + lambda free	1
IgG-lambda + IgM-lambda	2	IgG-kappa + IgG-kappa	1
IgG-kappa + IgA-kappa	2	IgA-lambda + IgM-kappa	2
IgG-kappa + IgM-kappa	2	IgF-kappa + IgA-lambda +	
IgG-lambda + IgA-kappa	1	IgM-lambda	1
IgG-lambda + IgAlambda	1		

(especially kappa) namely in urine. The interpretation and exact clinical meaning of this phenomenon is not very clear so far.

Modern, sensitive analytical methods used in clinical laboratories to identify and analyze the monoclonal immunoglobulins are an indisputable contribution and improvement in diagnostics, knowledge and monitoring of the therapy of monoclonal gammopathies. It is necessary to solve some of the difficulties of the laboratory evaluation and clinical interpretation of the immunofixation analysis of monoclonal immunoglobulins.

References

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