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A newly developed chemiluminescence immunoassay improves the detection of anti-PLA2R autoantibodies in primary membranous nephropathy

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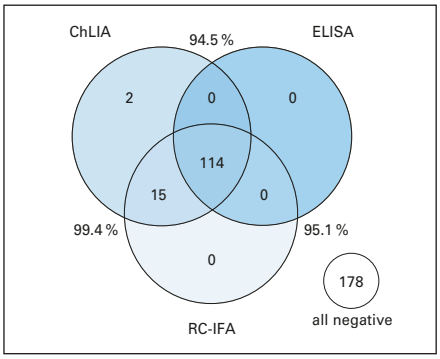
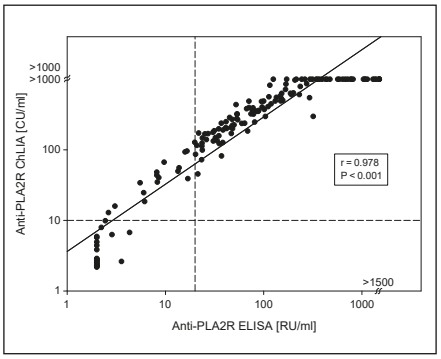
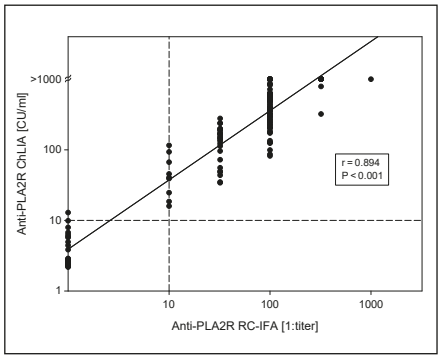


Anti-PLA2R reactivity as determined by ChLIA, ELISA and RC-IFA in 309 sera (155 pMN, 154 disease controls). Percentages indicate the agreement between assays.



Correlation between ChLIA and ELISA for the detection of anti-PLA2R autoantibodies in sera from 155 pMN patients. Dashed lines represent cut-off values for positivity.



Correlation between ChLIA and RC-IFA for the detection of anti-PLA2R autoantibodies in sera from 155 pMN patients. Dashed lines represent cut-off values for positivity.

Introduction

Autoantibodies against the **M-type phospholipase A2 receptor (PLA2R)** are important markers in the diagnosis and monitoring of **primary membranous nephropathy (pMN)**. For the detection of anti-PLA2R autoantibodies, a standardised recombinant **cell-based indirect immunofluorescence assay (RC-IFA)** and ELISA are widely used, the former providing higher sensitivity but lacking a finely graduated quantification of antibody titers. In this study, we evaluated the diagnostic performance characteristics of a novel standardised **chemiluminescence immunoassay (ChLIA)** by comparison with the established anti-PLA2R test systems.

ROC curve analysis	Anti-PLA2R positive		
	ChLIA	ELISA	RC-IFA
AUC	0.899	0.927	0.916
Max. sum of sensitivity and specificity (cut-off)	183.9 % (9.1)	181.3 % (3.0)	183.2 % (1:5)
Sensitivity at 98 % specificity (cut-off)	85.2 % (7.8)	81.9 % (5.8)	NA
Sensitivity at 99 % specificity (cut-off)	84.5 % (9.1)	80.7 % (7.3)	NA
Sensitivity at 100 % specificity (cut-off)	83.2 % (15.5)	76.1 % (15.2)	83.2 % (1:5)

Methods

Sera from 155 biopsy-proven pMN patients and 154 disease controls were analysed for autoantibodies against PLA2R by the novel ChLIA as well as by ELISA and RC-IFA.

Results

The clinical sensitivity of the ChLIA (83.9 %) was higher compared to ELISA (73.5 %) and equalled that of RC-IFA (83.2 %), at similar specificities (≥99.4 %). Among ELISA-negative pMN samples, ChLIA and RC-IFA yielded positive results in 39.0 % and 36.6 % of cases, respectively. The overall qualitative agreement amounted to 94.5 % (ChLIA vs. ELISA) and 99.4 % (ChLIA vs. RC-IFA).

Conclusion

The novel anti-PLA2R ChLIA outperforms the ELISA in detecting pMN patients and demonstrates almost perfect agreement with RC-IFA. It thus presents a promising alternative tool for accurate anti-PLA2R testing in routine diagnostic settings, with the advantage of rapid turnaround times and fully automated random-access processing.

Panel	n	Anti-PLA2R positive		
		ChLIA	ELISA	RC-IFA
Primary MN	155	130	114	129
Sensitivity	155	83.9 %	73.5 %	83.2 %
Secondary MN	6	0	0	0
IgA nephropathy	10	0	0	0
FS glomerular sclerosis	10	0	0	0
MP glomerulonephritis	10	0	0	0
Minimal change disease	17	1	0	0
Lupus nephritis class I-V	33	0	0	0
Lupus nephritis class V	34	0	0	0
System. lupus erythem.	34	0	0	0
Specificity	154	99.4 %	100 %	100 %

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