

## Utility of anti single and double stranded DNA antibodies as markers of disease activity in systemic lupus erythematosus.

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### Background/purpose:

Anti DNA antibodies are considered a hallmark of systemic lupus erythematosus (SLE). Anti double stranded DNA antibody (dsDNA) is part of the SLE classification and activity criteria due to its high specificity. However its sensitivity is moderate. On the other hand, the role of single stranded DNA antibodies (ssDNA) has not been fully addressed. The objective of this study is to correlate the presence of anti ssDNA and dsDNA antibodies with SLE activity, measured by ECLAM (*European Consensus Lupus Activity Measurement*).

### Methods:

We reviewed the charts of our SLE patients who had both anti ssDNA and dsDNA antibodies measured simultaneously between 2001 and 2011. Anti dsDNA was determined by *Crithidia luciliae* immunofluorescence assay and anti ssDNA was determined by a home-made ELISA. In each serologic determination, disease activity was established by ECLAM according to chart information from the previous 30 days. Finally, determinations were classified in 4 serologic groups for analysis: Group 1 (negative ssDNA and dsDNA), Group 2 (positive ssDNA and negative dsDNA), Group 3 (positive ssDNA and dsDNA) and Group 4 (negative ssDNA and positive dsDNA).

### Results:

Ninety patients were evaluated (80 female), with a median age (range) of 39 (23-77) years. There were 328 simultaneous serologic determinations of anti ssDNA and dsDNA. According to the ECLAM, activity was found in 269 (82%) determinations and inactivity was found in 59 (18%) determinations.

Considering the ECLAM as the gold standard for activity, we calculated sensitivity, specificity, positive and negative predictive value (PPV, NPV) and positive likelihood ratio (+LHR) for anti ssDNA and dsDNA, using dicotomic variables.

	Sensitivity % (95% CI)	Specificity % (95% CI)	PPV % (95% CI)	NPV % (95% CI)	+ LHR
Anti ssDNA	78 (73-82)	44 (39-49)	86 (83-90)	30 (25-35)	1.39
Anti dsDNA	28 (23-32)	92 (88-94)	94 (91-96)	22 (17-26)	3.29

When the serologic determinations were classified in groups, we calculated sensitivity, specificity, PPV, NPV and +LHR for anti ssDNA and dsDNA.

Serologic Groups	Sensitivity % (95% CI)	Specificity % (95% CI)	PPV % (95% CI)	NPV % (95% CI)	+ LHR
Group 1 (n: 83)	21 (17-27)	56 (42-69)	69 (57-78)	14 (10-18)	0.47
Group 2 (n: 165)	52 (45-58)	53 (39-65)	83 (76-88)	19 (14-26)	1.11
Group 3 (n: 77)	27 (22-33)	92 (80-97)	94 (85-98)	22 (17-28)	3.38
Group 4 (n: 3)	--	--	--	--	--

Finally, the seropositive determinations were correlated with the following variables:

Variables	Group 2			Group 3		
	RR	95 % IC	<i>p</i>	RR	95 % IC	<i>p</i>
< 50 years	2,65	1,47-4,77	<b>0,001</b>	19,18	6,9-53,21	<b>0,0001</b>
Joints	1,31	0,46-3,74	0,607	3,79	1,17-12,27	<b>0,026</b>
Skin	0,93	0,27-3,12	0,902	1,79	0,49-6,45	0,370
Renal	4,17	1,11-15,73	<b>0,035</b>	6,35	1,62-24,95	<b>0,008</b>
Hematologic	0,74	0,41-1,34	0,323	1,03	0,48-2,22	0,939
Erythro-sedimentation rate	1,43	0,72-2,85	0,304	1,66	0,71-3,87	0,238
Hypocomplementemia	4,13	2,05-8,31	<b>0,0001</b>	6,31	2,83-14,06	<b>0,0001</b>

*RR: relative risk*

**Conclusion:**

Anti ssDNA antibody shows a higher sensitivity and lower specificity than anti dsDNA antibody for SLE activity. The presence of anti ssDNA with or without anti dsDNA, was associated with younger age, hypocomplementemia and renal involvement.