IgG versus IgG+ IgM anti-double stranded DNA measurement: An assay audit for clinical practice

Background

For over 30 years, UCH has used an ELISA to detect serum anti-double stranded (ds) DNA antibodies (Ab) (*DISASTAT ELISA assay; FDNA 100*) that is about to become unavailable. It detects IgG and IgM anti-ds DNA Ab. We will now be using an IgG specific ELiA (*Phadia 2500 analyser; 14-5500-01*). Running the two assays in parallel, we have compared their clinical use in our systemic lupus erythematosus (SLE) cohort.

Methods

We compared samples of SLE patients who attended our clinic between October 2020 and February 2021. Results were classified in 5 ranges (Table 1).Normal Range (NR) was <50 IU/ml for the DISASTAT ELISA and <10 IU/ml for the IgG EliA.

Discrepancy was defined by a discrepancy of at least one level range of DISASTAT ELISA (assay A) versus IgG ELiA (assay B).

Table1: Ranges used to compare assays

Range	Value
0	Normal Range (NR)
1	< 2 times NR
2	[2-5 NR [
3	[5 – 10 NR [
4	≥ 10 NR

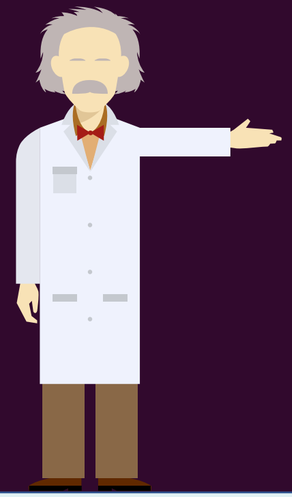
Results

265 samples, performed in 186 patients, were considered. The mean age was 45 years old [19 – 76]; sex ratio F/M of 11.4. Main ethnicities were Caucasian (42.5%), Afro-Caribbean (27.4%) and Asian (22.6%). Disease activity was assessed using the British Isles Lupus Assessment Group (BILAG) 2004 index expressed as a global score (GS) and varied between 0 and 32; 17.5% had a GS ≥12.

Both assays were correlated to the GS ($p<0.0001$); the correlation coefficient was higher in assay B than assay A (34.1% versus 28%). The Correlation coefficient between assay A and B was 82.4%.

A discrepancy was found in 50 samples of 33 patients (18.9 %) (Table2). Levels of assay A were discrepant to assay B by more than one range in 11 cases (4.2%). We assume the dsDNA antibodies in these patients were virtually all IgM.

There was no statistical difference in patients' age, gender, ethnicity and disease activity between samples with and without discrepancy.



An IgG specific anti-ds DNA assay seems to provide an answer to the mystery of why some SLE patients in clinical remission have persistently high anti-dsDNA values.

Table 2(A) and (B): Samples with discrepant anti-dsDNA assays' values

(A)

Sample	GS	IgG+IgM		IgG	
		Absolute level	Range	Absolute level	Range
1. *	2	141	2	8.3	0
2. *	2	128	2	8.1	0
3. *	2	127	2	8.7	0
4. *	1	283	3	8.9	0
5. *	0	274	3	13	1
6. *	2	219	2	4.1	0
7. *	0	119	2	3.6	0
8. *	0	12520	4	12	1
9. *	0	5183	4	4.9	0
10. *	1	558	4	37	2
11. *	2	151	2	4.3	0
12.	5	385	3	45	2
13.	2	173	2	18	1
14.	2	204	2	11	1
15.	1	126	2	16	1
16.	0	65	1	6.5	0
17.	2	228	2	18	1
18.	16	464	3	35	2
19.	0	259	3	29	2
20.	17	259	3	26	2
21.	0	71	1	4.4	0
22.	21	461	3	43	2
23.	11	443	3	43	2
24.	23	390	3	30	2
25.	12	185	2	16	1

(B)

Sample	GS	IgG+IgM		IgG	
		Absolute level	Range	Absolute level	Range
26.	5	166	2	11	1
27.	2	620	4	95	3
28.	10	58	1	3.2	0
29.	2	59	1	9.9	0
30.	0	67	1	8.9	0
31.	0	468	3	24	2
32.	1	644	4	95	3
33.	0	595	4	75	3
34.	0	101	2	11	1
35.	21	146	2	18	1
36.	14	168	2	13	1
37.	10	169	2	19	1
38.	0	177	2	12	1
39.	10	748	4	61	3
40.	3	559	4	54	3
41.	3	78	1	7.2	0
42.	8	253	3	24	2
43.	9	61	1	2.4	0
44.	3	54	1	4.2	0
45.	3	137	2	18	1
46.	0	73	1	7.1	0
47.	1	504	4	88	3
48.	1	518	4	98	3
49.	1	776	4	88	3
50.	1	53	1	7.4	0

GS: Global score ; *samples with marked discrepancy

SCAN ME

Rym Abida[1,2], Emily Apsley[1], David Isenberg[1]

1. *University College Hospital, London, UK.*
2. *University Tunis El Manar, Faculty of medicine of Tunis, Tunisia.*