



A Testing Panel for Lupus Anticoagulant with Improved Sensitivity

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INTRODUCTION

Testing for Lupus anticoagulant (LA) remains problematic due to the lack of a single test that is both sensitive and specific. Laboratories typically have to utilize a panel consisting of a screening test and a confirmatory test. The most widely-used tests are the dilute Russell's viper venom time (dRVVT) and the Hexagonal phospholipid neutralization (HPN) for screening and confirmation, respectively. We had previously employed these two tests in our LA panel. dRVVT was performed initially and if negative the patient was considered to be negative for LA. If dRVVT was positive then HPN was performed. If negative, the case was again considered to be negative for LA. Only if the HPN was positive, was the case considered to be positive for LA. Our anecdotal experience showed that this particular panel had missed a significant number of cases with LA. In this study, we design a new panel and assess the improvement in testing sensitivity.

MATERIALS AND METHODS

Our new panel calls for testing of both dRVVT and HPN simultaneously. If both results are negative or positive, this indicates the absence or presence of LA, respectively. If any one of the two results is positive, a third test, Platelet neutralization procedure (PNP) would be performed. A positive PNP would support the presence of LA, and vice versa. After implementation of the new panel, we prospectively evaluated 41 patients with prolonged dRVVT and/or HPN (Table 1.).

RESULTS

Using the results of the new panel as gold-standard, the specificity of the old panel is 92%. However, the sensitivity of the old panel (dRVVT as a screen and HPN for confirmation) is quite low (25%) (Table 2). Further analysis showed that this low sensitivity was mostly due to the low sensitivity of HPN, and only in a few cases due to the low sensitivity of dRVVT (Table 1).

Case No	dRVVT	dRVVT interp.	HPN	PNP	PT/PTT/TT	OTHER DATA	Final Dx (new panel)	Dx with old panel	Eval. of old panel
1	54.6	pos	pos	pos	13.1/56.8/16.3		pos	pos	TP
2	56.9	pos	neg	pos	29.6/73.8/17.2		pos	neg	FN
3	43.6	pos	neg	pos	00/48.7/20.4		pos	neg	FN
4	33.7	neg	pos	pos	00/42.5/17.0		pos	pos	TP
5	44.7	pos	neg	pos	15.9/85.0/190.8	heparin	non-dx	NEG	N/A
6	53.4	pos	neg	pos	21.7/55.4/18.2		pos	neg	FN
7	53	pos	neg	pos	16.1/42.1/18.9		pos	neg	FN
8	47.6	pos	neg	neg	18.7/244.1/>100	heparin	neg	neg	TN
9	43.3	pos	neg	pos	15.2/50.1/18.9		pos	neg	FN
10	51	pos	neg	neg	27.2/48.2/200		neg	neg	TN
11	49.1	pos	neg	pos	20.1/63.8/16.3		pos	neg	FN
12	43.7	pos	neg	pos	15.2/69.1/71.1	heparin	non-dx	neg	N/A
13	51.2	pos	neg	neg	21.1/42.5/17.0		neg	neg	TN
14	48.4	pos	neg	pos	00/00/18.5		pos	neg	FN
15	44	pos	neg	neg	26.5/51.6/16.4		neg	neg	TN
16	55.2	pos	neg	pos	26.2/62.0/17.5		pos	neg	FN
17	107	pos	neg	pos	66.9/107.5/>100		non-dx	neg	N/A
18	45.2	pos	neg	neg	21.1/36.9/17.9		neg	neg	TN
19	49.7	pos	neg	pos	22.1/>100/>100	heparin	non-dx	neg	N/A
20	41.9	borderline	pos	pos	14.8/74.4/60.4		non-dx	pos	N/A
21	35.9	neg	pos	pos	00/59.8/15.7		pos	pos	TP
22	47.1	pos	neg	pos	17.9/78.8/18.4		pos	neg	FN
23	58.4	pos	neg	pos	19.4/57/19.9		pos	neg	FN
24	43.4	pos	neg	neg	18.7/30.6/17.4		neg	neg	TN
25	54.5	pos	neg	neg	22.6/37.1/18.2		neg	neg	TN
26	46.8	pos	pos	pos	16.1/36.9/20.6		pos	pos	TP
27	66.9	pos	neg	neg	26.7/37.6/20.1		neg	neg	TN
28	64.9	pos	neg	pos	18.0/54.4/54.6	heparin	non-dx	neg	N/A
29	35	neg	pos	neg	13.7/35.7/16.7		neg	neg	TN
30	50	pos	borderline	pos	14.2/42.1/20.3		pos	neg	FN
31	43.6	pos	neg	pos	18.6/49.0/17.5		pos	neg	FN
32	47.5	pos	neg	neg	21.4/36.7/18.2		neg	neg	TN
33	51.5	pos	neg	neg	19.1/37.7/18.8		neg	neg	TN
34	44.6	pos	neg	neg	13.9/35.6/17.3		neg	neg	TN
35	51.5	pos	neg	pos	14.6/48.7/18.7		pos	neg	FN
36	60.6	pos	neg	pos	21.8/144.2/>100	heparin	non-dx	neg	N/A
37	61.8	pos	neg	neg	16.8/64.9/18.1		neg	neg	TN
38	47.3	pos	neg	pos	15.2/62.4/202.1		non-dx	neg	N/A
39	58.5	pos	neg	pos	24.4/208.7/>100	heparin	non-dx	neg	N/A
40	40.7	neg	pos	neg	71.2/34.1/16.1		neg	pos	FP
41	50.8	pos	neg	Neg	15.7/32.5/17.0		neg	neg	TN

Table.1: Lupus Anticoagulant Panel Results

Legends- PT: Prothrombin Time, PTT: Partial Thromboplastin Time, TT: Thrombin Time, DX: Diagnosis, TP: True Positive, FP: False Positive, TN: True Negative, FN: False Negative, N/A: not applicable

STATISTICAL ANALYSIS

		New panel	
		Positive results	Negative results
Old panel	Positive results	4	1
	Negative results	12	12
	Total	16	13

Table 2.: The specificity of the old panel is 92%. However, the sensitivity of the old panel is quite low (25%)

CONCLUSIONS

The increase in sensitivity with the new panel (dRVVT, HPN, and PNP), as shown in this study, suggests that this panel may be considered as an improvement in laboratory diagnosis of LA.

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