patients, concurrent renal biopsy was performed, unless contraindicated. The ISN/RPS criteria were used to assess the histopathologic features of LN. Those Patients were further subcategorized into 2 groups; active proliferative (ISN/RPS classes III/IV) and non-proliferative (classes I/II/V).

Results: The serum concentrations of Axl and ferritin were significantly higher in patients with active SLE than inactive SLE (3765 ± 235 vs. 2513 ± 130 pg/ml, $P = 0.001$) and (111 ± 26 vs. 18.4 ± 4 ng/ml, $P = 0.0001$) respectively. Serum Axl levels were significantly higher in active renal versus active non-renal SLE patients (3765 ± 235.3 vs. 2825 ± 200.7 pg/ml, $P = 0.04$). In the active renal patients with paired kidney tissue and blood samples, none of the biomarkers tested discriminated classes of LN, although serum Axl, ferritin and IGFBP4 levels were higher in the proliferative subgroup. The levels of Axl, ferritin and IGFBP4 correlated significantly with SLEDAI scores (Axl, $r = 0.58$, $P < 0.0001$; ferritin, $r = 0.53$, $P < 0.0001$; IGFBP4, $r = 0.229$, $P = 0.03$). However, only serum Axl levels correlated significantly with the renal SLEDAI ($r = 0.46$, $P = 0.01$). The levels of Axl, IGFBP4 and sTNFR2 correlated with decreased C3 levels ($r = -0.54$, $P < 0.0001$; $r = -0.29$, $P = 0.007$; $r = -0.29$, $P = 0.007$) respectively. Only serum Axl and ferritin correlated with urinary PCR ($r = 0.42$, $P < 0.0001$; $r = 0.22$, $P = 0.04$) respectively. These markers were more specific, but less sensitive, in detecting concurrent SLE activity than elevated anti-dsDNA or decreased C3. The specificity values of serum ferritin and IGFBP4 for concurrent active lupus nephritis were higher than anti-dsDNA or C3. Serum ferritin was the best predictor of global SLE activity (AUC 0.81, $P < 0.0001$), followed by C3 (AUC 0.79, $P < 0.0001$) then Axl (AUC 0.71, $P = 0.002$), while both Axl and C3 were the best predictors of lupus nephritis activity (AUC 0.72, both).

Conclusion: In pediatric SLE patients, serum ferritin and Axl perform better than traditional yardsticks in identifying disease activity, either global or renal. The performance of these serum markers should be explored further in a longitudinal cohort of pediatric SLE patients.

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SAT0235

THE EFFECT OF ANTIPHOSPHOLIPID ANTIBODIES ON APTT WAVEFORM PATTERNS

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Background: Patients with antiphospholipid antibody (aPL) are said to be at increased risk for thrombosis, however it is difficult to predict whether they will develop thrombosis. In recent years, it has been revealed that the characteristics of the second derivative curve of APTT waveform with aPL positive patient is biphasic changes^{1,2}. As first step in predicting the risk of thrombosis, we sought to understand the effect of aPL on APTT waveform patterns.

Objectives: To analyze the characteristics of APTT waveforms according to the background diseases and the presence of aPL

Methods: Patients who underwent coagulation function tests from 2017 to 2019 were analyzed. A coagulation waveform (Clot waveform: CW) was drawn using a fully automatic coagulation time measuring device manufactured by Instrumentation Laboratory From the APTT waveform, the 1st derivative curve (DC) indicating the coagulation speed and the 2nd DC indicating the coagulation acceleration were depicted to measure the 1st DC height, 2nd DC peak 1 time, and 2nd DC peak 1 height (Figure1³). Patients were divided into CTD with aPL-negative patients (group A), aPL-positive patients with no prior thrombosis (group B), and antiphospholipid antibody syndrome (APS) (group C). Patients characteristics and aPL (anti-cardiolipin [CL] antibody IgG, anti-CL antibody IgG, anti-CLβ2GP1 complex antibody, LA-APTT, and LA-DRVVT) status were examined. A further analysis was performed according to the numbers of positive aPL. Comparison between the three groups were made by the one-way ANOVA method, with significant differences set as p-values <0.1. Factors with significant differences were analyzed by Steel-Dwass test. APTT waveforms was analyzed according to the numbers of positive aPL by least squares methods. Furthermore, to determine the cut off value of APTT, 1st DC height, 2nd DC peak 1 time, and 2nd DC peak 1 height for each case with 2 or more positive aPLs and 3 positive aPLs, area under the curve (AUC) of the receiver operating characteristic (ROC) curve, sensitivity and specificity were calculated.

Figure 1.

Results: The APTT waveform was analyzed in 61 patients (51 women, 83.6%) with average age of 54.1 ± 17.1 years. Group A was 26 cases, Group B was 18 cases, and Group C was 17 cases. APTT, 2nd DC peak1 time, 2nd DC peak1 height, 1st DC peak time were significantly different among A, B, and C groups ($p < 0.01$). APTT, 1st DC peak height, 2nd DC peak 1 time, and 2nd DC peak 1 height differed among the number of aPL ($p < 0.01$, respectively). APTT and 2nd DC peak1 time prolonged by 9.43 (seconds) and 16.3 (seconds) respectively according to the number of aPLs increased, and 1st DC peak height (mabs/s) and 2nd DC peak1 height (mabs/s²) decreased by 56.4 (mabs/s) and 223.9 (mabs/s²) respectively according to the number of aPLs decreased (Table 1). APTT > 35.2 (seconds) (sensitivity 80%, specificity 80.4%), 2nd DC peak1 height > 302 (mabs/s²) (sensitivity 80%, specificity 91.3%) were relevant to the presence of two or more aPLs and APTT > 35.2 (seconds) (sensitivity 100%, specificity 80%), 2nd DC peak1 height > 302 (mabs/s²) (sensitivity 100%, specificity 90%) were relevant to the presence of three aPLs.

Table 1.

The number of positive aPL	0	1	2	3	p value
The number of cases	27	19	4	11	
APTT (seconds)	28.9 [26.8, 31.4]	30.9 [29.1, 38.2]	31.1 [27.3, 54.2]	60.7 [45.9, 73.7]	0.0001
2nd DC peak time (seconds)	29.2 [26.8, 30.7]	33.7 [31, 41.7]	36.1 [31.5, 99]	75.8 [50.5, 102.4]	0.0001
2nd DC peak height (mabs/s ²)	839.9 [666.1, 962.2]	669.6 [346.4, 946]	608.4 [137.8, 956.7]	119.3 [30.6, 196]	0.0001
1st DC peak height (mabs/s)	309.6 [260.6, 355.1]	271.5 [168, 353]	241.8 [96.3, 364.0]	135.6 [76.8, 163]	0.0001

Conclusion: The presence of aPL was more related to the 2nd DC peak1 height of APTT waveform than APTT. A detailed review of the APTT waveform may further predict future thrombosis risk.

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