IMPORTANCE OF THROMBOCYTE VOLUME PARAMETERS IN TYPE I DIABETES MELLITUS PATIENTS WITH AND WITHOUT CLINICAL FINDINGS OF DIABETIC KETOACIDOSIS

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BACKGROUND

Thrombocyte volume parameters such as MPV (mean thrombocyte volume) and PDW (thrombocyte distribution volume) are parameters used in evaluation of thrombocyte size which have hemostatic importance. The increased thrombocyte volume is a marker of thrombocyte activation. The thrombocyte activity is important in pathophysiology of diseases with a tendency of thrombosis and inflammation. In adult studies it has been reported that MPV increases in thrombotic diseases such as obesity, diabetes mellitus (DM), atherosclerosis, cerebrovascular diseases and this situation could be responsible from the thrombotic process.

OBJECTIVES

The aim of the present study is to evaluate the risk of thrombosis by measurement of MPV and PDW values, in Type 1 DM patients with and without the clinical findings of diabetic ketoacidosis (DKA).

METHOD

The hemograms of 20 Type I DM patients who have admitted with the clinical findings of DKA and 26 Type I DM patients without the clinical findings of ketoacidosis and age and gender-matched 30 control cases were investigated at the time of admission, at least 1 week after the admission after improvement of clinical findings of ketoacidosis and at least 3 months after the admission and MPV and PDW values were recorded. Additionally, pH and HCO3 values in blood gas analysis, HbA1c and blood glucose values were recorded.

RESULTS

MPV and PDW values at the time of admission were found to be higher in cases with the clinical findings of DKA when compared with the cases without the clinical findings of DKA and also the values were found to be higher in cases without the clinical findings of DKA when compared with the control group. A significant negative correlation was found between MPV values and pH and HCO3 values in patients admitted with the clinical findings of DKA (respectively r: -0.234 p: 0.044, r: -0.275 p: 0.029).

RESULTS

Table 1. Clinical and laboratory characteristics of the cases

	DKA (n=20)	DM without DKA (n=26)	Control group (n=30)	P value
Age (years)	11.2±2.4	11.9±2.5	11.5±2.1	0.568
Boys/girls, n	10//10	12/14	15/15	0.426
Systolic BP (mmHg)	92.2±8.8	98±11.2	104±13.2	<0.05
Diastolic BP(mmHg)	64.8±9.8	69.8±8.8	72.6±8.4	0.324
Glucose (mg/dl)	356.8±54.2	234.2±46.5	94.1±9.2	<0.001
HbA1c (%)	14.6±2.8	10.2±2.6	5.2±0.5	<0.001
pH	7.12±0.14	7.36±0.12	N/S	<0.05
Serum HCO3 (mmol/L)	7.2±1.2	18.2±3.1	N/S	<0.001
Platelet count (x10^9/L)	282.6±30.7	178.3±34.1	162.3±22.1	<0.05
MPV(fL)	11.34±1.22	10.56±0.89	9.32±0.24	<0.05
PDW	14.86±2.68	12.82±1.96	10.22±1.01	<0.05

Table 2. Laboratory characteristics of the patients who have admitted with the clinical findings of DKA

	At diagnosis	1. week	3. month	P value
Glucose (mg/dl)	356.8±54.2	268.6±32.7	126.1±14.2	<0.05
HbA1c (%)	14.6±2.8	12.4±1.2	8.1±1.2	<0.05
Platelet count (x10^9/L)	282.6±30.7	226.4±32.6	168.2±24.6	<0.05
MPV(fL)	11.34±1.22	10.89±0.81	10.04±0.32	<0.05
PDW	14.86±2.68	13.1±1.88	11.38±0.98	<0.05

A decrease was observed in MPV and PDW values in parallel to the decrease in HbA1c and blood glucose levels 3 months after the diagnosis.

CONCLUSION

It has been demonstrated that MPV and PDW values in cases admitted with the clinical findings of DKA were higher when compared with the cases without ketoacidosis and the control group. It has also been demonstrated that this increase in MPV values is related with the degree of acidosis at the time of admission and MPV values became normal after initiation of fluid and insulin treatment. As it is already known that the clinical manifestation of DKA is related with fluid-electrolyte loss, tendency to thrombosis and systemic inflammatory process, the results of the current study is valuable. The measurement of thrombocyte volume parameters in cases with the clinical findings of DKA could be used in the diagnosis and progress of the disease.

ESPE 2015
265--P2
Diabetes and Insulin
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DOI: 10.3252/pso.eu.54espe.2015
Poster presented at: 54th Annual Meeting 1-3 October ESPE 2015 BARCELONA European Society for Paediatric Endocrinology