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Assessment of platelet indices in patients with long-standing type 1 diabetes mellitus

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PURPOSE / OBJECTIVES

Platelet hyperreactivity is a factor which contributes towards increased risk of cardiovascular events in diabetes mellitus (DM). We analyzed platelet indices in long-term DM type 1 (T1DM) patients with the aim to investigate whether platelets' morphology is altered, potentially predisposing them to cardiovascular events in the future.

MATERIALS & METHODS

The study group consists of 83 patients with T1DM (male/female=45/38; mean age=41.23±11,06 years; duration of diabetes 29,9 ± 9,7 years) and a control group of 32 age- and gender-matched healthy people (male/female=13/19; mean age=40,29±9,65 years) during the 2018-2020 period. Platelet parameters were derived from the results for complete blood count (Sysmex XN1000). Morphological analysis of the Romanowsky-stained blood smears was performed for all patients.

RESULTS

We observed elevated platelet indices in the clinical group, comparing them with the control group: PLT- 290,7×10⁹/l ± 80 vs 256,18×10⁹/l ± 44; MPV- 10,41fl ± 1.14 vs 9.98fl ± 1.34; P-LCR- 29.903% ± 7.82 vs 29.086% ± 8.38; PCT- 0.307% ± 0.074 vs 0.239% ± 0.05; PDW- 12,697% ± 11,84 vs 1,58% ± 1,71.

RESULTS

A significant positive correlation was found between MPV and PDW($r = 0.94$; $p < 0.0001$) and a negative correlation between MPV and PLT ($r = -0.39$; $p = 0.0003$), PDW and PLT($r = -0,56$; $p = 0,001$); PLT and age ($r = -0.30$; $p = 0.03$) in the clinical group. For 54 (65%) of diabetic patients, the evidence for platelet anisocytosis was positive. These patients had a value for MPV > 10fl (mean = 11.08fl; CV = 0.47; SD=0,68).

SUMMARY/CONCLUSION

Platelets of patients with long-standing T1DM show morphological evidence of hyperreactivity, potentially contributing to increased cardiovascular risk. Macrothrombocytes have larger biological activity. With advancing age, their proportion increases in contrast to the accelerated platelet consumption in order to maintain the constant functional platelet activity. Unlike other markers for assessment of platelet function, platelet indices do not require specialized hemostasiological equipment, which determines their rentability in clinical and diagnostic terms

**Platelet hyperreactivity,
contributing to increased cardiovascular
risk in patients with long-standing
type 1 diabetes mellitus**