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Platelet activity and it's correlation with inflammation and cell count readings in chronic heart failure patients with reduced ejection fraction

Aušra Mongirdienė, Jolanta Laukaitienė, Vilius Skipskis
Lithuanian university of health sciences

- **Background.** There has been an increasing interest in the role of inflammation in thrombosis complications in chronic heart failure (CHF) patients. The incidence of thrombosis in HF is shown to be the highest in patients classified as NYHA IV. It is stated that inflammation is regulated by platelet-induced activation of blood leukocytes.
- **Aim** - to compare the platelet, inflammation and cell count readings in CHF with reduced ejection fraction (HFrEF) patients according to NYHA functional class and to evaluate the correlation between those readings.
- **Methods.** 185 patients were examined in complete blood cell count, platelet aggregation, C reactive protein (CRP), NT-proBNP and fibrinogen concentrations.

Complete blood count readings of the CHF patients according to NYHA groups

Readings	I NYHA (n=26)	II NYHA (n=78)	III NYHA (n=54)	IV NYHA (n=27)	P
MPV, Fl (mean±SD)	9.25±0.46 ^a	9.65±1.22 ^b	9.78±1.15 ^c	10.75±1.2	<0.005
Neutrophil count x10 ⁹ /l	4.20±1.32	4.52±1.34	4.11±1.64 ^c	4.99±1.73	0.028
Neutrophil , %	58.65±9.55 ^a	62.61±8.02	58.56±10.35 ^c	65.86±8.99	0.034
Lymphocytes count 10 ⁹ /l	2.09±0.85 ^a	1.70±0.56	1.88±0.59 ^c	1.44±0.40	0.005
Lymphocytes , %	28.53±8.82 ^a	24.48±7.14	28.05±9.66 ^c	20.35±6.15	<0.009
Monocytes count x10 ⁹ /l	0.59±0.21 ^a	0.61±0.25	0.60±0.25	0.76±0.27	0.014
Monocytes , %	8.23±1.84 ^a	8.7±2.77	8.90±3.41	10.67±3.63	0.045

ANOVA was used for comparisons. Statistically significant difference between: a - NYHA I and NYHA IV, b - NYHA II and NYHA IV, c- NYHA IV and NYHA III. MPV – mean platelet volume.

Correlation between complete blood count, clinical and laboratory readings

Readings	CRP, mg/l	Fibrinogen concentration, g/L
PLT $\times 10^9/l$	0.307, 0.008	0.180, 0.042
Neutrophil count $\times 10^9/l$	0.378, 0.0001	0.308, 0.0001
NT-proBNP, ng/l	0.203, 0.005	
Lymphocyte count $10^9/l$	-0.220, 0.028	-0.174, 0.03
Monocyte count $\times 10^9$	0.371, 0.0001	0.315, 0.0001
MPV, fI		0.244, 0.004

PLT – platelet count, MPV - mean platelet volume, Cortisol_{m-e} – difference between morning and evening cortisol concentrations, NT-proBNP - N-terminal pro brain-type Natriuretic Peptide.

Conclusions:

- 1) MPV could be considered as additional reading reflecting patient's condition;
- 2) use of MPV identifying patients at risk of hypercoagulable state, should be evaluated in more extensive studies;
- 3) increasing neutrophil and monocyte count could indicate a higher inflammatory state in chronic HFrEF.