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The difference of complete blood count, inflammation, cortisol and platelet readings in chronic heart failure with reduced ejection fraction patients according to neutrophil count

Aušra Mongirdienė, Jolanta Laukaitienė, Vilius Skipskis

Lithuanian university of health sciences

- **Background.** Hypercholesterolemia is stated heightens neutrophil production, thereby accelerating cardiovascular inflammation. But there is a lack of information about neutrophil relation with hypercholesterolemia, prothrombotic condition and stress statement in chronic heart failure patients. The results provided in the literature are obtained from heterogeneous population and measurement of blood cell count methods.
- **Aim** - to compare lymphocytes, monocytes, platelets count, platelet (MPV, platelet aggregation), cortisol and inflammation (CRP, fibrinogen concentration) readings in very narrow patients' groups (those who had had ischemic heart disease with chronic heart failure with reduced ejection fraction (CHFrEF)) according to neutrophil count investigated in one laboratory according to study-wide protocol.
- **Methods.** CHFrEF patients (n=180) were investigated. The patients were divided into two groups according to neutrophil count: $\geq 4.37 \times 10^9$ L (n=97) and $< 4.38 \times 10^9$ L (n=83).

Complete blood readings in the CHF_rEF groups according to neutrophil count

Readings	≤4.37 x10 ⁹ L; n=97	>4.38 x10 ⁹ L; n=83	P
PLT x10 ⁹ /L	209.45 (42.75)	238.07(89.87)	0.032
WBC x10 ⁹ /L	5.81(1.15)	8.51(1.68)	0.0001
Lymphocytes count x10 ⁹ /l	1.71(0.68)	1.89(0.83)	0.109
Lymphocytes , %	0.56 (0.21)	0.72(0.27)	0.0001
Monocytes count x10 ⁹ /L	0.56±0.21	0.72±0.27	0.0001

Ccomparison was made using t test.

Conclusion: platelet, leukocyte, monocyte count and lymphocyte percent were higher in the group with higher neutrophil count.

Inflammation and cortisol readings in the CHF_rEF groups according to the neutrophil count

Readings	≤4.37 x10 ⁹ L n=97	>4.38 x10 ⁹ L n=83	P
Fibrinogen concentration, g/l	4.00 (2.01-6.11)	4.42 (2.35-7.69)	0.028*
CRP, mg/L	3.10 (1.00-26.76)	4.9 (1.00-90.50)	0.017*
Cortisol _m mM	460.94 (155.59)	491.67(150.84)	0.029
Cortisol _e mM	350.19 (95.78)	409.14(114.92)	0.007

*- comparisom was made using Mann-Whitney test. t test was used for others.

Conclusions: Inflammation and cortisol readings were higher in the group with higher neutrophil count.

Correlations:

Readings	Cortisol _m , nM	Cortisol _e , nM	Cortisol _{m-e} , nM
Neutrophil count x10 ⁹ /l		0.256, 0.009	
NT-proBNP, ng/l	0.238, 0.015		
Lymphocyte count 10 ⁹ /l		-0.246, 0.012	0.256, 0.009
Monocyte count x10 ⁹	0.279, 0.004		

Cortisol_{m-e} – difference between morning and evening cortisol concentrations, NT-proBNP - N-terminal pro b-type Natriuretic Peptide.

Conclusions:

1. Neutrophil, monocytes and platelet takes place in maintaining of low inflammation in CHF_rEF patients.
2. The bigger inflammation environment is, the more stressful condition patients have.