Соотношение морфофункциональных типов тромбоцитов в исследуемых группах

ANALYSIS OF MORPHOFUNCTIONAL TYPES OF PLATELETS IN CHILDREN AFTER SHIGA TOXIN-PRODUCING ESCHERICHIA COLI HEMOLYTIC UREMIC SYNDROME (STEC-HUS)

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Background

- About 30 % of patients after the acute episode of STEC-HUS have varying degrees of sequelae: proteinuria (15–30 % of cases); arterial hypertension (5–15 %); chronic kidney disease (CKD; 9–18 %); and end-stage kidney disease (ESKD; 3 %)
- Hemostatic imbalance can play an important role in the progression of renal disease after the acute phase of STEC-HUS
- The investigation of morphofunctional types of platelets may reveal primary hemostasis disturbance in children after STEC-HUS

Aim

- to determine the morphofunctional characteristics of circulating platelets according to the degree of their activation in children after the acute episode of STEC-HUS using computer morphometry

Patients and Methods

36 patients after the acute episode of STEC-HUS

- **1st group N=16**: ▪1-year follow-up after acute phase ▪mean age 2,3±1,7 years
- **2nd group N=20**: ▪1-16 years after acute phase ▪mean age 10,2±4,8 years

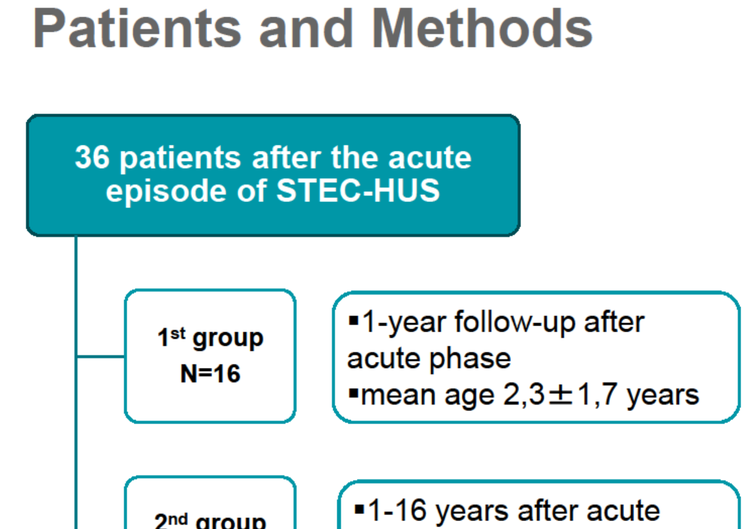
- Vital computer morphometry of platelets with computer phase-interference microscope “Cytoscan”

Control group:

14 healthy children (mean age 2,4±1,6 years)

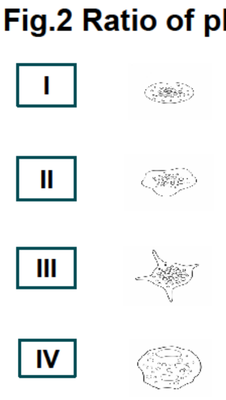
Results

Fig. 1 Morphologic types of platelets



In the cell population 4 morphologic forms of platelet with according to various activation levels were distinguished

Fig.2 Ratio of platelets forms in control group, %



- **48%** ‘resting’ platelets
- **36%** platelets with low level of activation
- **14%** platelets with high level of activation
- **2%** degenerative forms

Table 1. Characteristics of nephropathy after acute episode of HUS

Outcomes	1st group (n=16)	2nd group (n=20)	All (n=36) n (%)
Full recovery	4 (25%)	2 (10%)	6 (16,7%)
CKD I	2 (12,5%)	3(15%)	5 (13,9%)
CKD II	8 (50%)	7(35%)	15 (41,7%)
CKD III	2 (12,5%)	4(20%)	6 (16,7%)
CKD IV	0	1(5%)	1 (2,8%)
ESRF	0	3(15%)	3 (8,2%)
Arterial hypertension	3(18,7%)	5(25%)	8 (22,2%)
Proteinuria	7(44%)	10(50%)	17 (47,2%)
Microhematuria	3(18,7%)	2(10%)	5(13,9%)

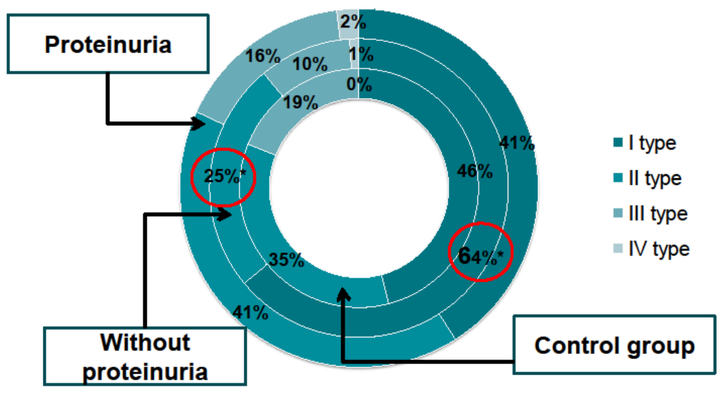
Table 3. The ratio of morphofunctional types of platelets in studied groups

Morphofunctional types of platelets	1st group (n=16)	2nd group (n=20)	Control group (n=15)
I type	48%	46%	46%
II type	36%	38%	35%
III type	14%	15%	19%
IV type	2%	1%	0%

Platelet form’s ratio (%) in 1st group

Despite the fact that the ratio of the forms of platelets in the 1st group did not differ from the control group, when dividing the patients depending on the presence of proteinuria and duration of anuria, we identified changes, confirming the activation of platelets in children with nephropathy

Fig. 3 Platelet form’s ratio (%) in 1st group depending on the proteinuria



* - p<0,05 between subgroups with and without proteinuria

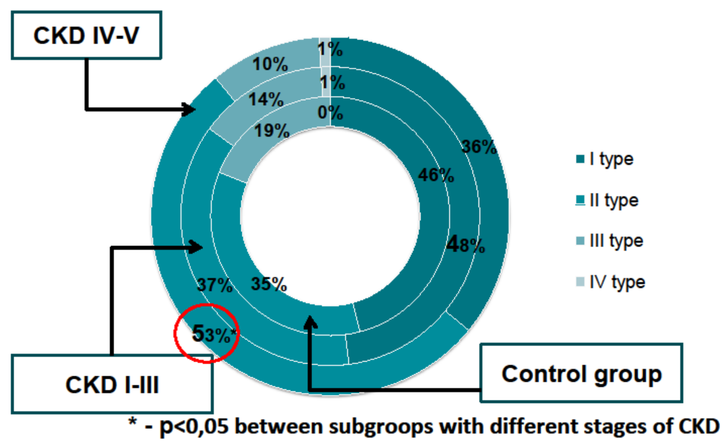
Fig. 4 Platelet form’s ratio (%) in 1st group depending on the duration of anuria

* - p<0,05 between subgroups with different duration of anuria

Platelet form’s ratio (%) in 2nd group

In 2nd groop we also showed increasing platelet activation in patients depending on the stage of chronic kidney disease

Fig. 5 Platelet form’s ratio (%) in 2 group depending on the stage of CKD



* - p<0,05 between subgroops with different stages of CKD

Conclusions

- Morphofunctional characteristics of platelets do not differ from the control in children with favorable outcome after STEC-HUS
- Increase of the number of potentially able to activation platelets indicates the imbalance in primary hemostasis in patients with long period of anuria in acute phase, the presence of proteinuria, the degree of GFR decline
- In these patients antiplatelet agents are recommended to prevent microvascular thrombosis and improve outcome after STEC-HUS

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