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SINGULARITIES OF HEMOSTASIS SYSTEM IN PATIENTS WITH EROSIVE AND ULCEROSIS CHANGES OF GASRODUODENAL ZONE AND THEIR INTERACTION WITH CARDIAC PATHOLOGY

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Introduction

The erosive and ulcerative gastroduodenal changes in not only gastroenterological problem, but also a heart and vascular diseases problem too, because the existence of ulcerative gastroduodenal changes restrict the pathogenetical treatment of heart and vascular diseases, especially for use the drugs that have influence on haemostasis because of high risk of gastrointestinal bleeding formation like aspirin, clopidogrel at patients with ischemic heart disease, anticoagulants at patients with atrial fibrillation, artificial heart valves and at patients with open and X-ray heart surgery [6]. Thus, the estimation of haemostasis and fibrinolisis system at this category of patients is very important that become the aim of our investigation on patients with ulcerative and erosive gastroduodenal changes with concomitant heart diseases that demand open heart surgery (cardiopulmonary bypass, surgical treatment of heart valves defects, and aorta aneurism) on preoperative period.

The aim of this study was to evaluate the haemostasis and fibrinolisis system at the patients with ulcerative and erosive gastroduodenal changes with concomitant heart diseases that demand open heart surgery on preoperative period.

Methods

The study involved 157 patients including 118 males and 39 females. Patient age ranged between 15 and 72 years (mean age 54,03±10,18 years) (M±σ)) admitted to the Heart Surgery Department of the Omsk Regional Clinical Hospital, than underwent open heart surgery because of ischemic heart disease (n=115) or heart valves defects with different etiology including insufficient of aorta valve at patients with aorta aneurisms (n=42). All patients were divided on two clinical groups – first group (n=115) with endoscopy verified ulcerative and erosive gastroduodenal mucosa changes (91 males and 24 females, mean age 54,25±10,10 years (M±σ));

second group (n=42) – without endoscopy verified ulcerative and erosive gastroduodenal mucosa changes (24 males и 15 females, mean age 53,43±10,37 years (M±σ)).

At two groups were investigated some haemostasis and fibrinolisis system parameters like partial platelets time (normal value 26-37 sec), platelet index (normal value 85-110%), platelet correlation (normal value 0,95-1,25), fibrinogen (normal value 1,8-3,5 g/L); soluble fibrinmonomer complex (normal value 0,0- 5,5 mg/100 ml); - XIIa – depended fibrinolisis (normal value 4-10 min).

All investigated haemostasis and fibrinolisis system parameters were estimated at both group of patients with ischemic heart disease and heart valves defects and also we estimated the influence of the atrial fibrillation on haemostasis and fibrinolisis system parameters.

Thus, according to various estimates [4], the prevalence of high stress level on trombinemia we were estimated the correlation interactions between soluble fibrinmonomer complex and high anxiety level that was estimated using K.K. Yakhin and D.M. Mendelevitch questionnaire. In accordance with this questionnaire the parameter more than +1.28 indicate on good health level, and less than +1.28 on high anxiety level [3].

Results and Discussion

In first and second groups of patients all mean haemostasis and fibrinolisis system parameters are presented in Table 1.

Thus, we can consider than at patients with ulcerative and erosive gastroduodenal mucosa changes the more often changes of haemostasis system parameters are occurred in compare with patients without endoscopy verified ulcerative and erosive gastroduodenal mucosa changes and more intensive changes was estimated for mean level of soluble fibrinmonomer complex in first group. All another parameters were not significant between two groups. In both groups of patients in some cases was estimated the hypocoagulation presence with internal coagulation mechanism (11% in both group) and external coagulation mechanism (18% in both group). Anyway the hypocoagulation parameters were not so significant for limit the open heart surgery (platelet correlation 1,5 and more, partial platelets time 48 sec and more) and we can consider that they were connected with uses of oral anticoagulants before hospitalization and more excessive consumption of coagulative factors in condition that associated with thrombinemia.

The depress of XIIa – depended fibrinolisis registated at 27% of patients with ulcerative and erosive gastroduodenal mucosa changes in compare with 16% of patients without endoscopy verified ulcerative and erosive gastroduodenal mucosa changes.

Probably these changes have the common pathogenetic mechanisms with increase of soluble fibrinmonomer complex and connected with inflammatory changes in atherosclerotic plague in patients with ischemic heart disease, damages of heart valves in valve defects, damages

of gastric mucosa and all these changes have at the same time protective effects against the bleeding from ulcerative and erosive gastroduodenal mucosa defects.

The features relating to the increase of the thrombinemia at patients with ulcerative and erosive gastroduodenal mucosa changes probably can be an organism reaction on the damage to prevent bleeding from mucosa destructive zone. This fact have a valuable clinical meaning at pathogenetical features of heart and vascular pathology:

- for patients with ischemic heart disease thrombinemia can be a risk factor of atherosclerosis progression, including after open heart surgery - cardiopulmonary bypass [2];

- for patients with damages of heart valves in valve defects the risk of embolic complications increases and also increases the artificial heart valves dysfunction and decrease the regression of the left ventricle hypertrophy at patients after aortal valve prothesis because of aortal valve stenosis [1,5];

- for patients with atrial fibrillation with different etiology the risk of stroke is increases because of brain vessels embolia [2].

Thus, we can consider the increase level of soluble fibrinmonomer complex as a valuable diagnostic test for dynamic investigation in clinical practice at patients with high risk factors during treatment of ulcerative and erosive gastroduodenal mucosa changes with antisecretic drugs and eradicational therapy at patients with Helicobacter pylori positive analysis. Also the increase level of soluble fibrinmonomer complex can be used as a valuable diagnostic test at patients during decrease of thrombinemia after anticoagulation therapy. This strategy can decrease the probability of gastrointestinal bleeding and decrease the risk of a fatal consequences of thrombinemia for heart and vascular system.

The next stage of our investigation was to estimate of the atrial fibrillation role in the haemostasis parameters changes, because according to several researchers the absence of the effective left atrial function at the patients with atrial fibrillation can lead to a blood stream decrease in auricle of the left atrial and this mechanism can increase the blood coagulation properties [2]. In first and second groups of patients the frequency of atrial fibrillation was 22 (19,1%) and 13 (30,9%) cases (Chi-Square test 1,85, p=0,17), that was indicated the absence of significant differences between groups, moreover the atrial fibrillation frequency was more low in first group than in second. Thus, we can consider that at patients with ulcerative and erosive gastroduodenal mucosa changes the thrombinemia can not be depend from atrial fibrillation frequency. However this fact can not exclude that atrial fibrillation can be an independent risk factor of thrombinemia formation. That is why we were investigated the mean haemostasis and fibrinolisis system parameters at patients included in our work (Table 2).

Thus, we can consider that thrombinemia parameters at patients with atrial fibrillation were higher than in patients without atrial fibrillation, however this was not significant. Probably the decrease of thrombinemia parameters at patients with atrial fibrillation was connected with uses of oral anticoagulants before hospitalization to prevent embolic complications as we can see on the presence of hypocoagulation with external coagulation mechanism, that according to several researchers can be a laboratory marker of the anticoagulants action [4].

The next stage of our investigation was to estimate the comparative analysis the haemostasis and fibrinolisis system parameters at patients with ischemic heart disease and heart valves defects for two groups of patients (Table 3).

Thus, we can consider the significant differences in more higher meanings of soluble fibrinmonomer complex at the patients with ischemic heart disease compared with the patients with heart valves defects especially more higher parameters of soluble fibrinmonomer complex at patients with ulcerative and erosive gastroduodenal mucosa changes. This fact can be connected with pathogenesis of atheroscrerosis that can initiate the coagulation system activity and also this fact can be connected with more often use of the anticoagulants therapy at patients with heart valves defects.

According to several researchers about important role of stress in thrombinemia formation [4], we were estimated the diagnostic meaning of anxiety level that was estimated using K.K. Yakhin and D.M. Mendelevitch questionnaire. In our group of patients the mean anxiety level that was +1,70 $\pm$ 3,48 ($M\pm\sigma$), and on calculating the Spearman correlation coefficient the correlation with thrombinemia was not significant r_s=0,17. As we can see the role of stress reaction in a realization of thrombinemia is not significant in both group of patients.

Conclusion

In conclusion, according to our results the haemostasis and fibrinolisis system parameters changes at patients that demands open heart surgery on preoperative period connected with thrombinemia formation that is higher at patients with ulcerative and erosive gastroduodenal mucosa changes and at patients with ischemic heart disease. Trombinemia is a common pathogenetic mechanism for ulcerative and erosive gastroduodenal mucosa changes formation and for formation of the ischemic heart disease, heart valves defects. In patients with ulcerative and erosive gastroduodenal mucosa changes trombinemia plays a protective role, but for heart and vascular diseases it plays a pathological action. The atrial fibrillation increases the blood soluble fibrinmonomer complex concentration. The hypocoagulation with external coagulation mechanism decreases the blood soluble fibrinmonomer complex concentration. The blood soluble fibrinmonomer complex concentration must be investigated in dynamics to control the effectiveness of the therapy. The role of stress reaction in a realization of thrombinemia is not

significant in patients with and without ulcerative and erosive gastroduodenal changes with concomitant heart diseases that demand open heart surgery.

Table 1

The parameters of haemostasis and fibrinolisis system at patients with (first group) and without (second group) ulcerative and erosive gastroduodenal mucosa changes

№	Parameters	Mean values, M±σ		Deviation of parameters	The frequency of pathological changes n (%)		
		ulcerative and erosive gastroduodenal mucosa changes			ulcerative and erosive gastroduodenal mucosa changes		In the whole group
		Positive	Negative		Positive	Negative	
1	partial platelets time	32,52 ±6,77	31,46 ±3,78	hypocoagulation with external coagulation mechanism	15 (13%)	2 (5%)	17 (11%)
				Decrease of partial platelets time	7 (6%)	1 (2%)	8 (5%)
2	platelet index	89,90 ±13,69	93,73 ±8,15	hypocoagulation with external coagulation mechanism (decrease of platelet index)	23 (20%)	6 (14%)	29 (18%)
3	platelet correlation	1,14 ±0,27	1,11 ±0,19	hypocoagulation with external coagulation mechanism (increase of platelet correlation)	23 (20%)	6 (14%)	29 (18%)
4	fibrinogen	3,33 ±1,12	3,07 ±0,83	Hyperfibrinogenemia	39 (34%)	9 (21%)	48 (31%)
5	soluble fibrinmonomer complex	7,45 ±6,52**	4,01 ±3,85**	thrombinemia	63 (55%)^^	13 (31%)^^	76 (48,4%)
6	XIIa – depended fibrinolisis	8,66 ±7,03	10,47 ±9,04	Depression of XIIa XIIa – depended fibrinolisis	31 (27%)	7 (16%)	38 (24%)
7	#			The presence of deviation of any parameter	91 (79%)^^	25 (60%)^^	116 (74%)

** $P = 0.02$ (t= 3,217) *vs* second group - *P*-value based on two-sided paired *t*-test.

^^ - P-value is from comparison (Chi-Square test) between two group of participants p<0,01,

- only categorical means estimated.

Table 2

The haemostasis system parameters in patients with and without atrial fibrillation

№	Parameters	Mean values, M±σ	
		Atrial fibrillation	
		Presence (n=35) M±σ	Absence (n=122) M±σ
1	partial platelets time	34,61±8,25	31,46±5,0
2	platelet index	82,21±18,56***	93,80±8,0***
3	platelet correlation	1,30±0,44***	1,09±0,16***
4	fibrinogen	3,28±1,22	3,25±0,99
5	soluble fibrinmonomer complex	7,22±7,23	6,21±5,67
6	XIIa – depended fibrinolisis	10,71±10,33	8,82±6,83

***- p<0,001 (t> 4,0).*P*-value based on two-sided paired *t*-test.

Table 3

The parameters of haemostasis and fibrinolisis system at patients with ischemic heart disease, heart valve defects at patients with (first group) and without (second group) ulcerative and erosive gastroduodenal mucosa changes

№	Parameters	ischemic heart disease (M±σ)			heart valve defects (M±σ)		
		ulcerative and erosive gastroduodenal mucosa changes		In the whole group (n=115)	ulcerative and erosive gastroduodenal mucosa changes		In the whole group (n=42)
		Presence (n=87)	Absence (n=28)		Presence (n=28)	Absence (n=14)	
1	partial platelets time	32,44 ±6,23	31,11 ±4,14	32,07 ±5,74	32,76 ±8,30	32,23 ±2,86	32,58 ±6,88
2	platelet index	92,51 ±10,91	94,46 ±7,04	93,05 ±9,99^^^	82,85 ±17,70	92,15 ±10,29	85,88 ±16,15^^^
3	platelet correlation	1,11 ±0,21	1,12 ±0,29	1,12 ±0,23^	1,28 ±0,44*	1,02 ±0,09*	1,23 ±0,41^
4	fibrinogen	3,36 ±1,08	3,23 ±0,89	3,32 1,03	3,23 ±1,23	2,76 ±0,58	3,08 ±1,07
5	soluble fibrinmonomer complex	8,31 ±6,62**	4,68 ±4,18**	7,30 ±6,24^^	5,04 ±5,67	2,58 ±2,62	4,22 ±4,97^^
6	XIIa – depended fibrinolisis	8,24 ±4,99	10,72 ±10,37	9,0 ±7,07	9,48 ±10,0	10,08 ±7,01	9,70 ±8,92

* - *P*-value based on two-sided paired *t*-test *p<0,05 (t>2,0), ** - p<0,01 (t>2,7) patients with ulcerative and erosive gastroduodenal mucosa changes *vs* patients without ulcerative and erosive gastroduodenal mucosa changes

^ - *P*-value based on two-sided paired *t*-test ^p<0,05 (t>2,0), ^^ - p<0,01 (t>2,8), ^^^ p=0,001 (t>3,0) patients with ischemic heart disease *vs* patients with heart valve defects in the whole group of patients

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Summary. The condition of hemostasis and fibrinolis systems was studied in patients with erosive and ulcerosis changes of gastroduodenal zone (n=115) and persons of control group (n=42) in period of preparing to the heart surgery for evaluation of pathogenic consequences in combination of these pathologic conditions and for generation of curing tactics in this category of patients. It is revealed, that thrombinemia is the most common mechanism for erosive and ulcerosis changes of gastroduodenal zone and for cardiovascular diseases (ischemic heart disease, cardiac vices, auricle fibrillation) and it play's the protection role in the first case and the pathogenic role in the second case. The presence of mucous layer destruction in upper part of the gastroduodenal tract, ischemic heart disease and atrial fibrillation are further risk factors for magnifying of filamentous fibrin strands plasma level. The magnitude of thrombinemia increases in presence of hypocoagulation, containing one, which specifying of peroral ahticoagulants using. The sequential treatment is validated in this category of patients, including erosions and ulcers of gastroduodenal zone epithelisation and decrease of thrombinemia. It is marked that the stress is non reliable significant factor for FSs increase in patients with cardiac pathology in period of preparation for the heart surgery with cardiopulmonary bypass.

Key words. Thrombinemia, erosive and ulcerosis changes of gastroduodenal zone, heart surgery, hemostasis.

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