

## PLATELET AGGREGATION AFTER EXPERIMENTAL BURN INJURY AND THERAPY

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*Based on data concerning the coagulation changes after thermal injury the authors studied platelet aggregation after burn and its treatment. Severe thermal injury of IIa and IIb degree was inflicted in white male rats ( $200 \pm 20$  g b. m.) under aether anaesthesia. It ranged over  $17,5 \pm 2,5$  % of the body surface. The animals were divided into the following groups: 1) burned non-treated; 2) burned and treated with Sol. Hartmanni (Hr), 3) burned and treated with Hemodex (Hx), and 4) controls. The treatment was intraperitoneally carried out immediately after the injury as well as on 6<sup>th</sup> and 24<sup>th</sup> hour after it. An elevation of the platelet aggregation for all the groups on the 24<sup>th</sup> hour after the injury was established.*

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**Key-words:** Thermal injury, platelet aggregation, consumption coagulopathy, treatment

Severe thermal injury is known to cause considerable changes in haemostasis (3,8,10). This is observed most clearly along the thermal shock phase. The injury causes systemic lesions simultaneously with the local ones (2,4). Blood cells including platelets are being damaged (7,11) which influences upon haemostasis (10).

We aimed at studying the platelet aggregation after burn and its treatment.

### MATERIAL AND METHODS

Severe thermal injury of IIa and IIb degree was inflicted in white male rats ( $200 \pm 20$  g b. m.) under aether anaesthesia. It ranged over  $17,5 \pm 2,5$  % of the body surface. The animals were divided into the following groups: 1) burned non-treated; 2) burned and treated with Sol. Hartmanni (Hr), 3) burned and treated with Hemodex (Hx), and 4) controls. Treatment with 1,5 ml per 100 g b. m. was intraperitoneally carried out immediately after the injury and with 1,0 ml per 100 g b. m. on 6<sup>th</sup>, 24<sup>th</sup>, and 48<sup>th</sup> hour after the injury. Blood samples were taken under aether anaesthesia before the injury and on the 24<sup>th</sup>

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and 48<sup>th</sup> h after it. Log time (LT) and maximum degree of platelet aggregation (MDA) with adrenaline were studied with Bioagrogen aggregometer. The results were processed according to Student's *t*-test.

## RESULTS AND DISCUSSION

LT (Table 1 and Fig. 1) for group one demonstrates tendency of decrease on the 24<sup>th</sup> and increase on the 48<sup>th</sup> h. In the other groups (2 and 3), LT increases more considerably on the 24<sup>th</sup> h in group 2.

MDA (Table 2, Fig. 2) is higher

than controls in all the groups on the 24<sup>th</sup> h. The increase of MDA is influenced better by Hx than by Hr. On the 48<sup>th</sup> h MDA decreases in all the groups.

Treatment with Hr and Hx benefits the LT on the 24<sup>th</sup> and 48<sup>th</sup> h. This effect coincides with the lower MDA in the groups treated with Hx and Hr on the 48<sup>th</sup> h after the injury. The higher MDA level on the 24<sup>th</sup> h coincides with literature data available (2,9). It is, probably, due to haemostasis activation or to platelet activation only (1,6,8). MDA reduction on the 48<sup>th</sup> h could be explained with the consumption coagulopathy.

**Table 1**  
*Log time [sec]*

Groups	Before burning	Time after burning	
		24 h	48 h
Burned non treated	264,37 ± 23,16 n=8	258,44 ± 23,42 n=9	283,11 ± 12,15 n=9
Burned + sol Hartmanni	264,37 ± 23,16 n=8	283,11 ± 10,21 n=9	268,22 ± 20,26 n=9
Burned + Hemodex	264,37 ± 23,16 n=8	268,22 ± 16,98 n=9	267,62 ± 23,67 n=8

**Table 2**  
*Maximum degree of platelet aggregation [%]*

Groups	Before burning	Time after burning	
		24 h	48 h
Burned non treated	7,77 ± 1,09 n=8	9,17 ± 0,89 n=9	7,06 ± 0,79 n=11
Burned + sol Hartmanni	7,77 ± 1,09 n=8	10,81 ± 2,06 n=8	6,80 ± 0,72 n=11
Burned + Hemodex	7,77 ± 1,09 n=8	8,89 ± 1,13 n=11	6,90 ± 0,83 n=10

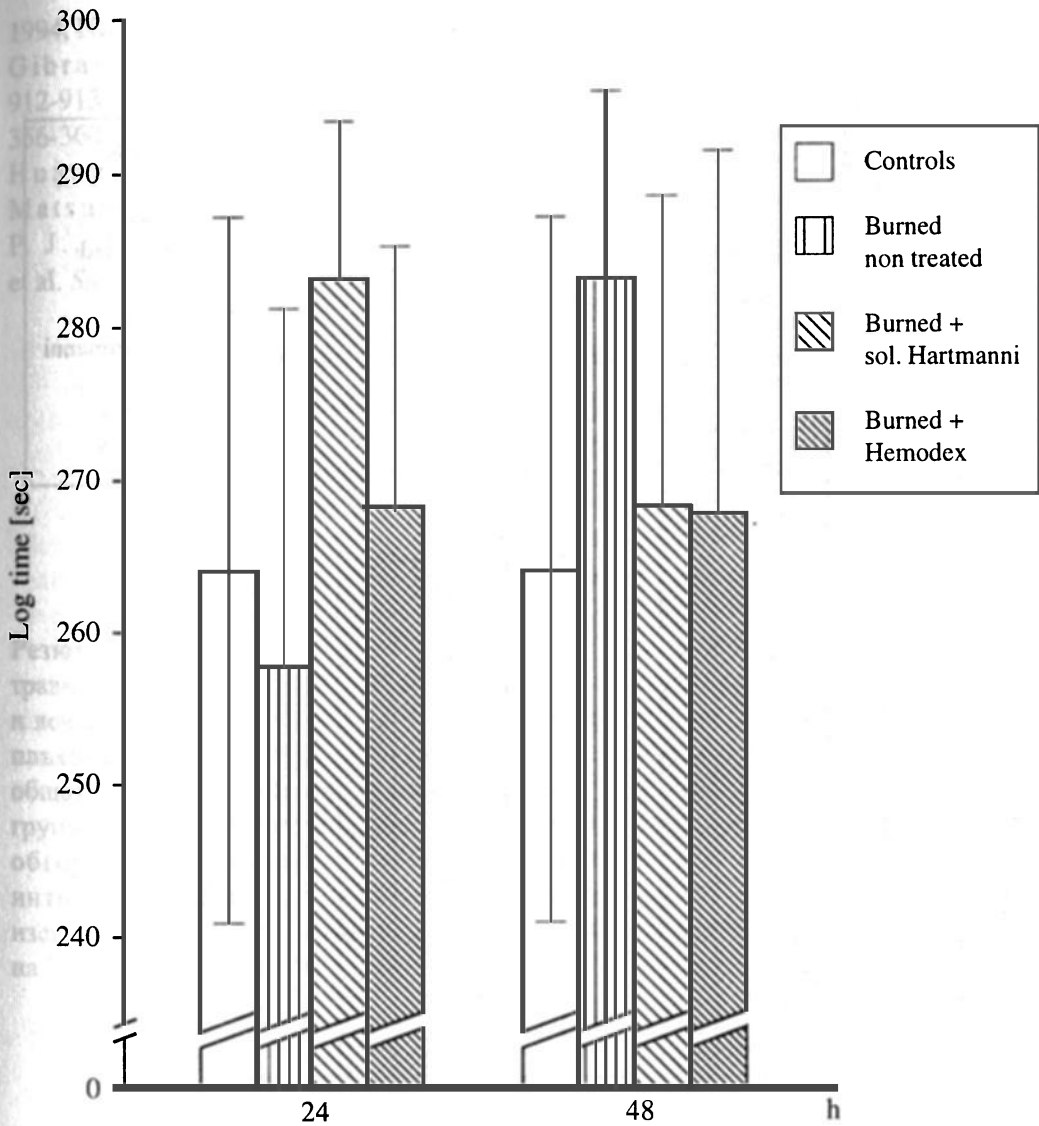


Fig. 1. Log time [sec]

### CONCLUSIONS

1. LT increases in burned animals treated with Hr and Hx.

2. MDA increases on the 24<sup>th</sup> h and decreases on the 48<sup>th</sup> h after thermal injury.

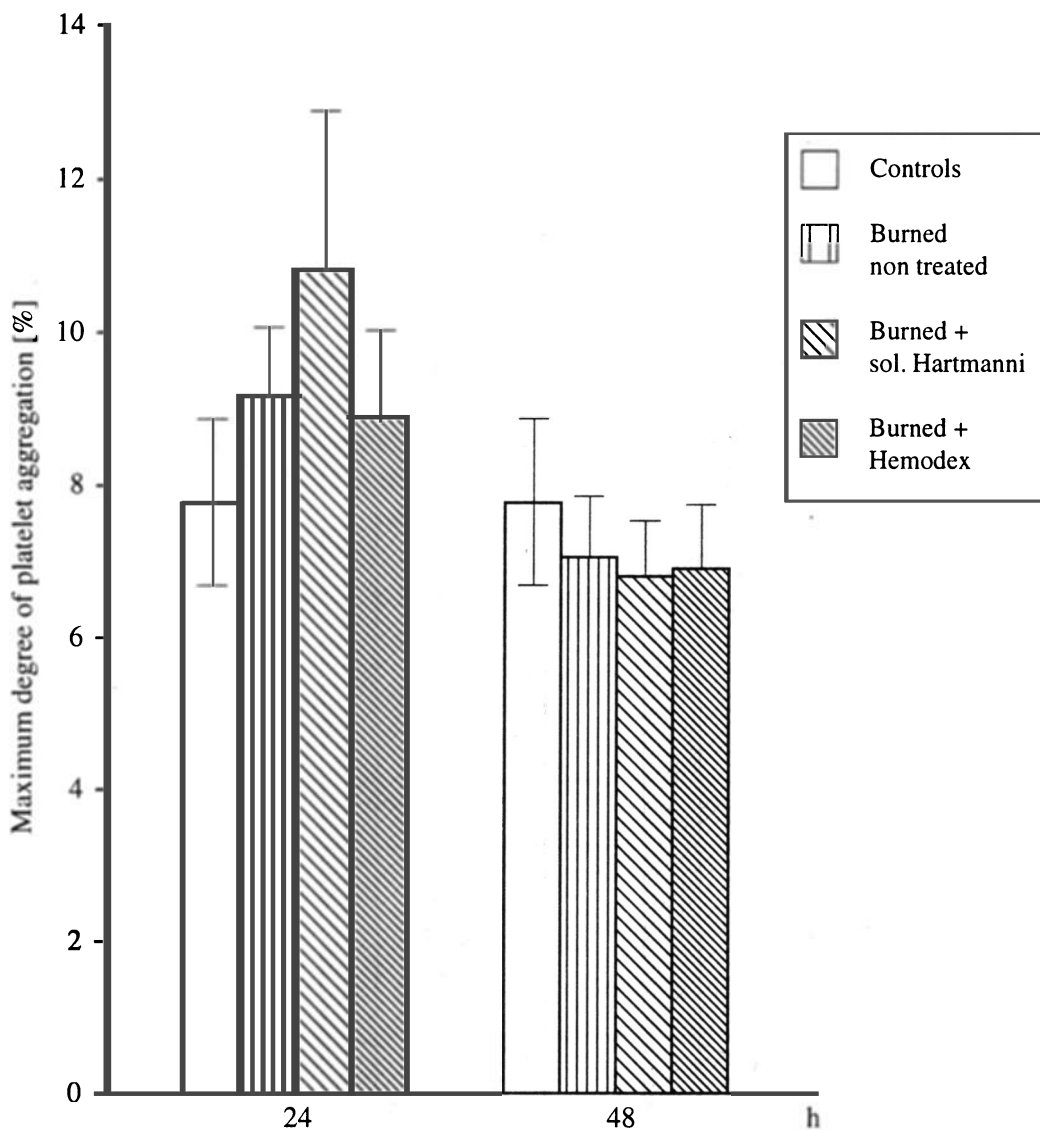


Fig. 2. Maximum degree of platelet aggregation [%]

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## Агрегация на тромбоцитите при термична травма в експеримент и лечение

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**Резюме:** Изхождайки от данните за промяна на хемокоагулацията след термична травма, си поставихме за цел да проследим агрегацията на тромбоцитите след обгаряне и лечение. Беше възпроизведена тежка термична травма (IIa-IIб степен) върху бели плъхове (200 ± 20 г. т. м.) под етерна наркоза. Обгарянето обхваща 17,5 ± 2,5 % от общата телесна повърхност. Експерименталните животни бяха разделени в следните групи: 1) обгорени нетретирани; 2) обгорени и третирани с разтвор на Хартман; 3) обгорени и третирани с хемодекс и 4) здрави. Лечението се провеждаше интраперитонеално веднага след травмата, на 6. и 24. след нея. Данните от изследването показват увеличение на агрегацията на тромбоцитите за всички групи на 24. час след травмата.