THE VERIFICATION OF REGENERATIVE EFFECTS OF THE HHP ANDULLATION THERAPY SYSTEM

Kovářová Lenka, Větvička Jaroslav, Botek Michal

Laboratory of Sport Motor Activities, FPES CU

THE VERIFICATION OF REGENERATIVE EFFECTS OF THE HHP ANDULLATION THERAPY BED

Kovářová Lenka, Větvička Jaroslav, Botek Michal
Laboratory of Sport Motor Activities, FPES CU

The objective of the study was to verify the acceleration of regenerative processes after a repetitive maximum sports performance. The performance parameter was the time achieved. Other parameters assessing the organism's fatigue level were biochemical parameters (see design of study), the heart rate during and after the exertion and its variability, while the subjective perception of fatigue was assessed using the Borg Scale of Perceived Exertion.

14 probands, who were randomly subdivided into two blinded groups, participated in the survey. The design of the study is presented in Table 1.

	ráno	dopoledne			odpoledne			večer
PO (V)	●○○	●	○○○	X (13)	●	○○○	X (13)	X (2)
PO (E)	●○○	●	○○○		●	○○○		
ÚT (V)	●○	●	○○○	X (13)	●	○○○	X (13)	X (2)
ÚT (E)	●○	●	○○○		●	○○○		
ST (V)	●○	●	○○○	X (13)	●	○○○	X (13)	X (2)
ST (E)	●○	●	○○○		●	○○○		
ČT (V)	●○○	X (5)	●					
ČT (E)	●○○		●					

Note: PO – Monday; ÚT – Tuesday; ST – Wednesday; ČT – Thursday; V – reference group (blinded); E – control group (blinded); X (13) programme 13 of the andullation bed; X (2) programme 2 of the andullation bed; X (5) programme 5 of the andullation bed;

●	Heart rate variability test
○	Blood sampling: urea, ALT, CK
○	Blood samplings: AST, GL, Creatinine, Bilirubin, GMT
●	Treadmill exercise stress test to exhaustion (performance = time achieved in the accelerated test)
○	Blood sampling: LA, BE (5th min)
○	Blood sampling: LA, BE (12th min)
○	Blood sampling: LA, BE (20th min)

Research results

The results presented in the chart (Chart 1) analyzing the average performance of both groups during the whole testing imply that the group of athletes using the bed showed a statistically significant increase in the performance (p = 0.018) in the afternoon of the first day (2), while there was no performance increase in the control group (p = 0.612). On the second day of testing, there was again an afternoon improvement in the performance of the group using the bed, but this improvement was not statistically significant (p = 0.128). No statistically significant differences were manifested in the comparison between both groups, which, however, could be caused by the different initial performance of both tested groups.
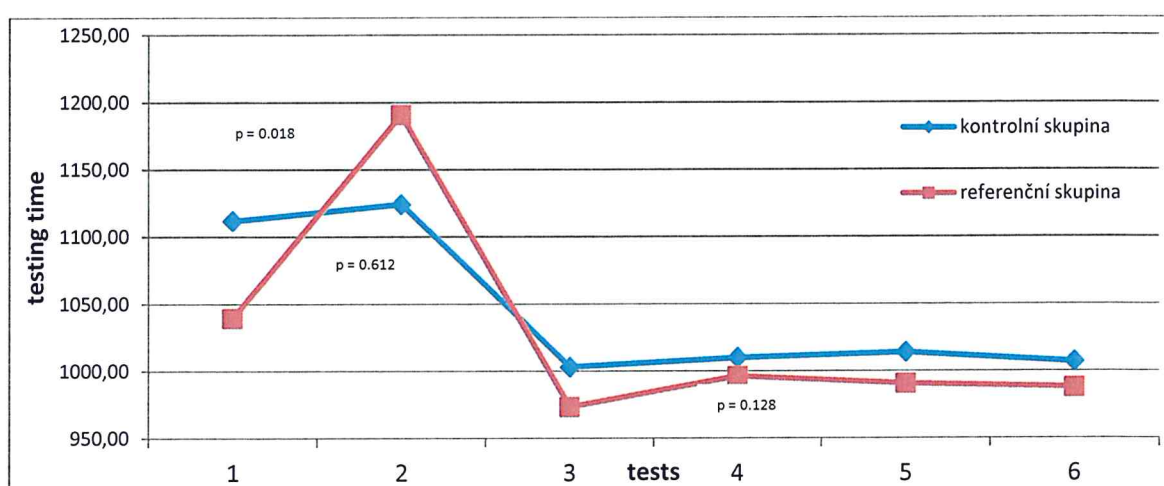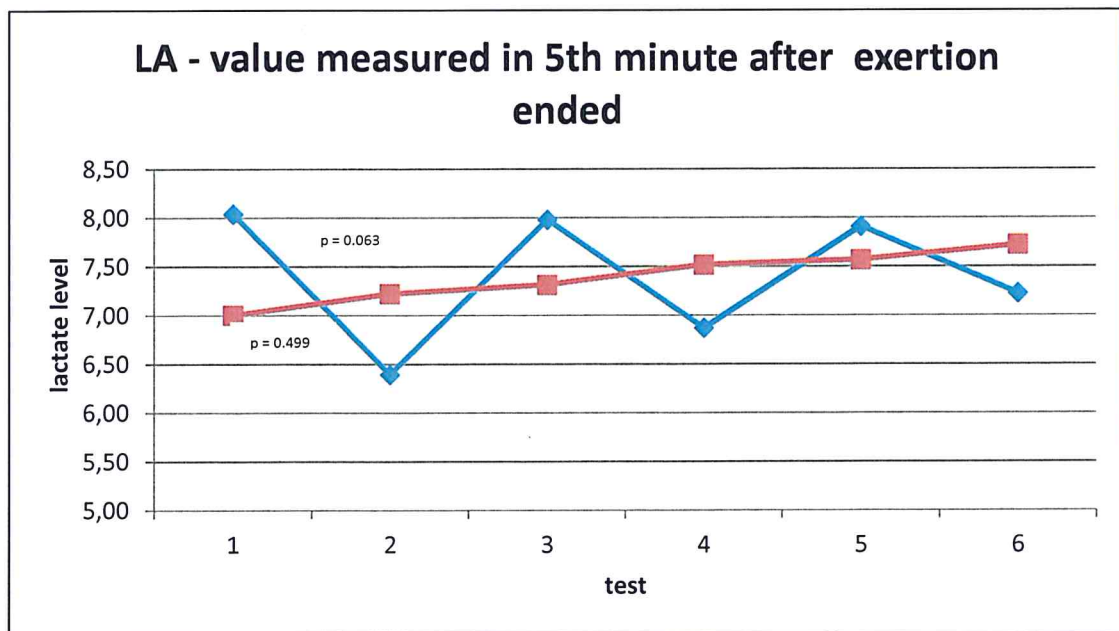

Kontrolní skupina: control group
Referenční skupina: reference group
Note. The chart displays average values for both groups, the data were statistically processed using the Wilcoxon Test.

The blood lactate concentration analysis produced some interesting findings. Whereas the values reached (from samplings in 5th, 12th and 20th minute) in the group using the bed were stable during the tests, the control group showed signs of fluctuations occurring always after the afternoon test. There was a drop in the maximum blood lactate concentrations reached in the control group by 20.5% in the afternoon of the first day, but the statistical significance at a level of 0.05 could not be manifested (p = 0.063). No such changes occurred on the following days any more. Statistically significant differences from the comparison of both groups were not manifested either, which, however, could have been caused by different initial values as was the case of the performance of both tested groups.

LA - value measured in 5th minute after exertion ended

8,50
8,00   p = 0.063
7,50
7,00
6,50   p = 0.499
6,00
5,50
5,00

lactate level

1   2   3   4   5   6

test

Note. The chart displays average values for both groups, the data were statistically processed using the Wilcoxon Test.

Similar results were also found for BE where the breakdown dynamics remained very similar in both groups (Chart 3).

LA breakdown dynamics

4,50
4,00
3,50
3,00
2,50
2,00
1,50
1,00
0,50
0,00

1   2   3   4   5   6
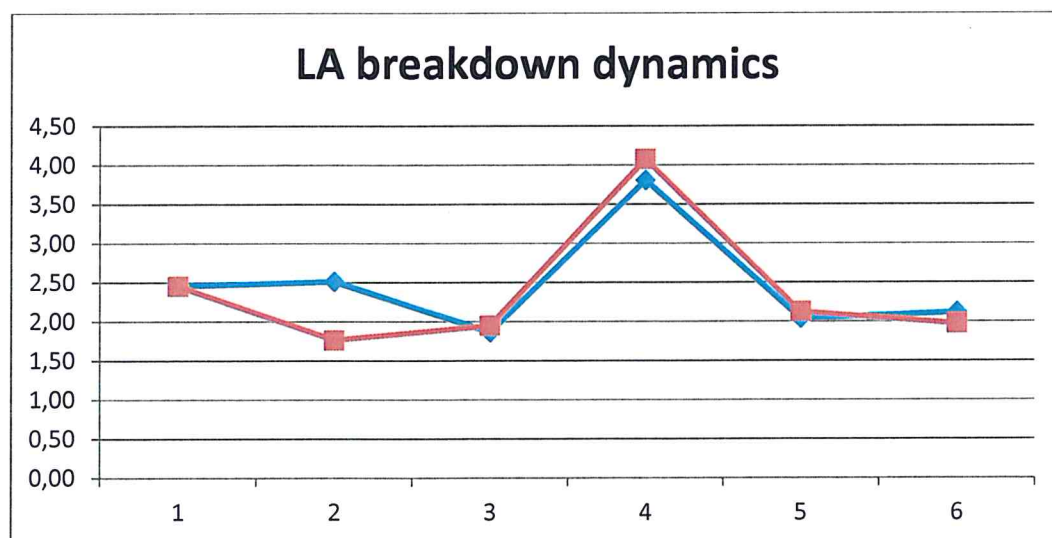
Differences were also identified in the assessment of the total spectral performance, which got worse (p = 0.043) in the control group (Chart 4), but, on the contrary, improved (p = 0.043) in the reference group (Chart 5).
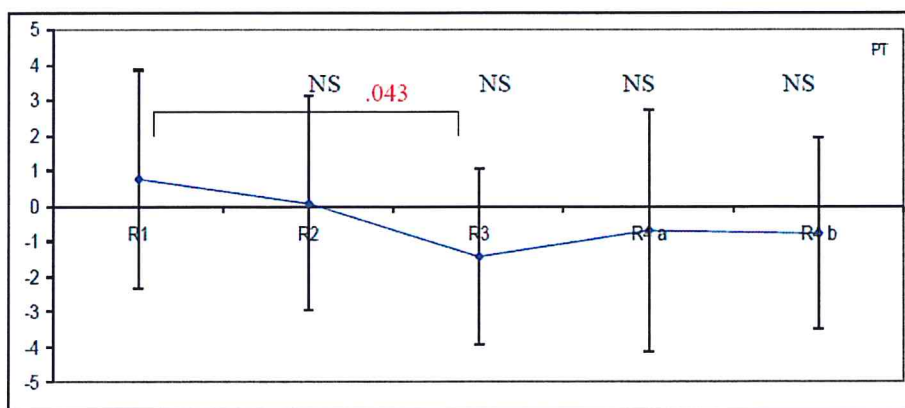
R1 – vstupní měření, R2 – druhy den; R3 – treti den; R4 a – R4 b: porovnání posledních dvou vyšetření čtvrtý den
Wilcoxon test
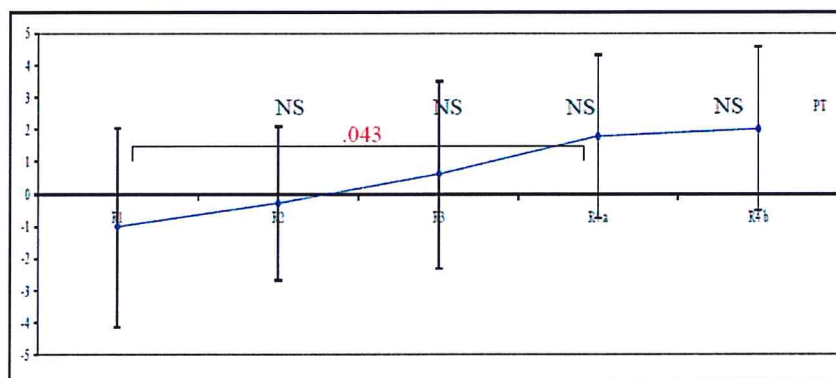
R1 – vstupní měření, R2 – druhy den; R3 – treti den; R4 a – R4 b: porovnání posledních dvou vyšetření čtvrtý den
Wilcoxon test

Note: R1 – initial measurement; R2 – second day; R3 – third day; R4 a – R4 b: comparison of the last two examinations on the fourth day, Wilcoxon Test

Analyzing the relevant change in the heart rate (resting HR before the test, relaxing after exercise – 60s), no inter or intra individual changes were manifested in either group.

**HR relaxing**

HR resting
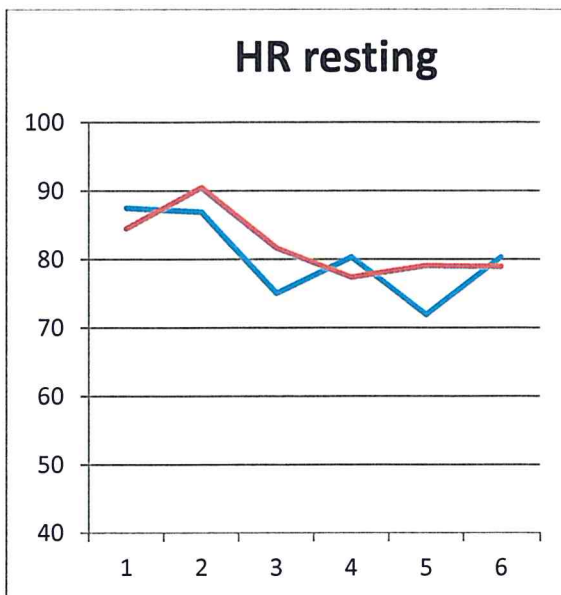
Analyzing the relevant change in the subjective perception of fatigue using the Borg Scale of Perceived Exertion (before and after performance), no inter or intra individual changes were manifested in either group.

Borg_before

Borg_after
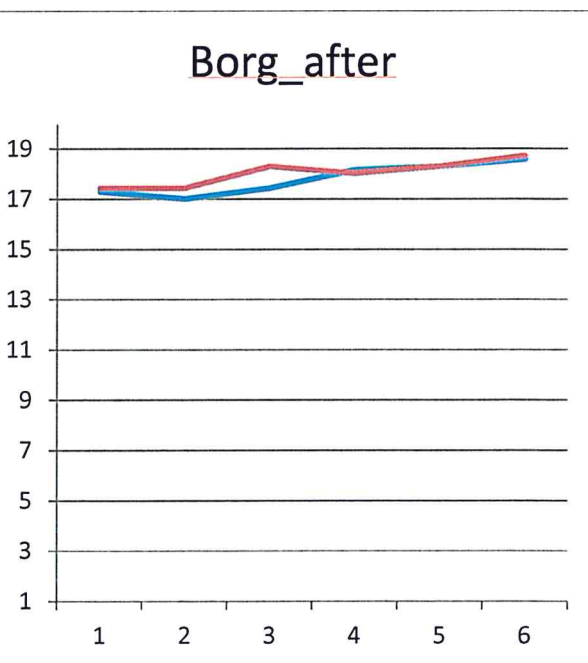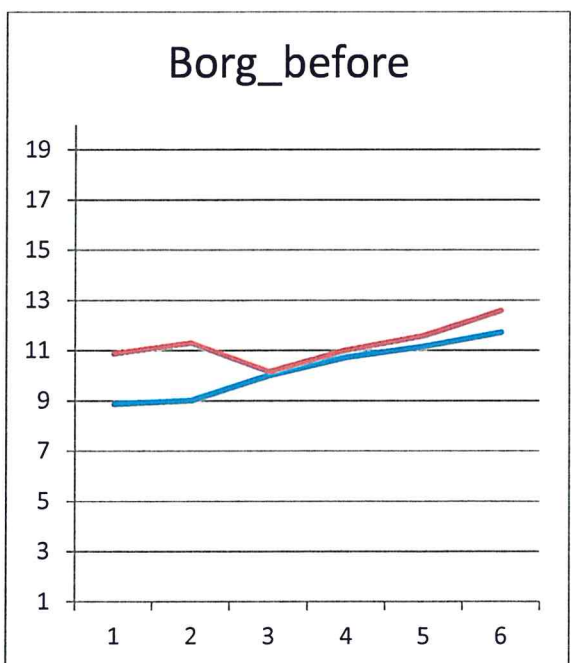
Analyzing the other biochemical parameters, no more inter or intra individual changes were manifested.

Urea

Creatinine

Bilirubine Before

ALT

AST

CK

GL
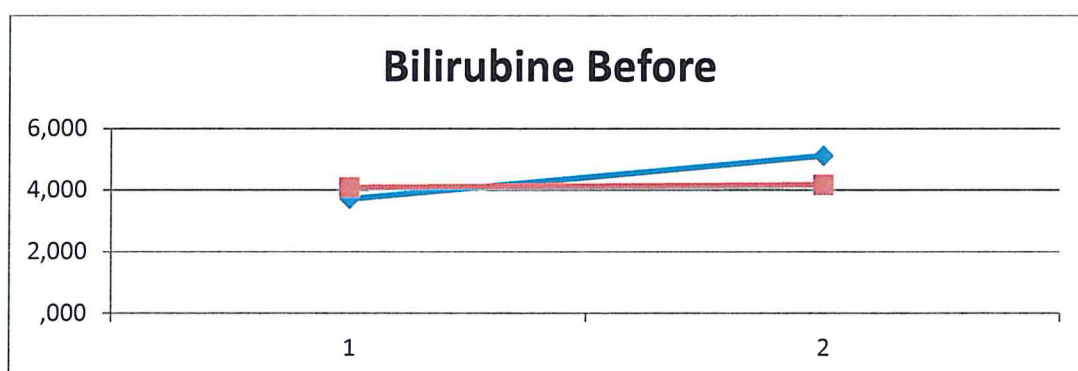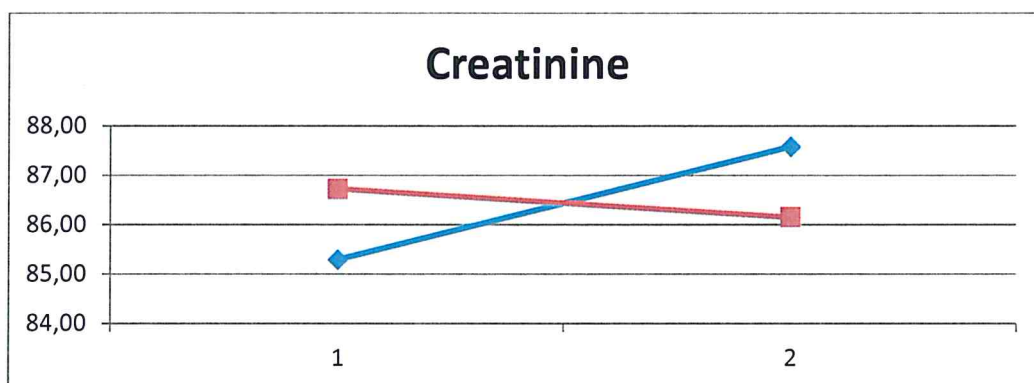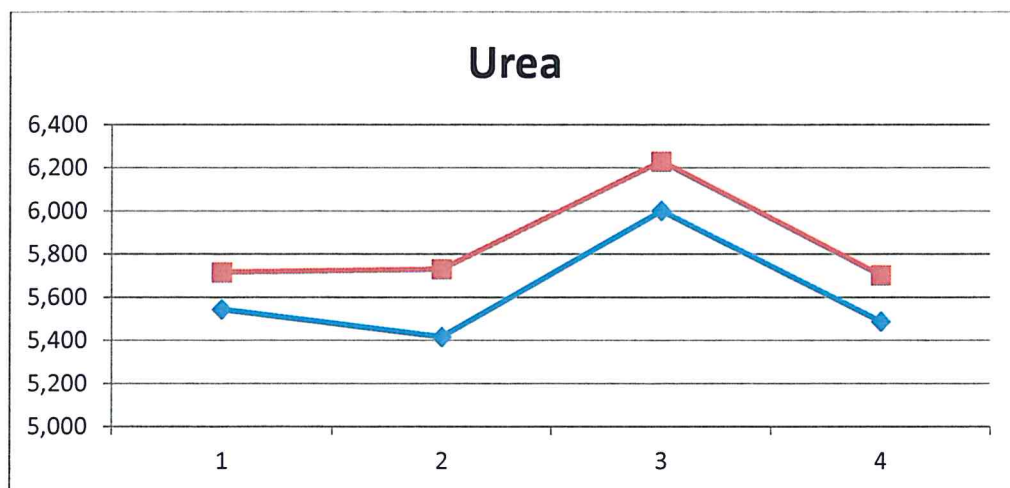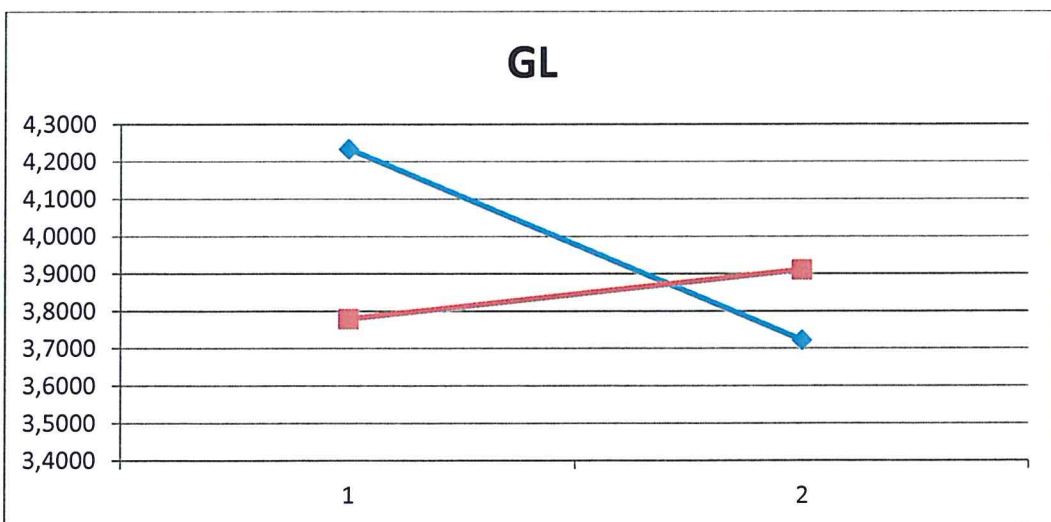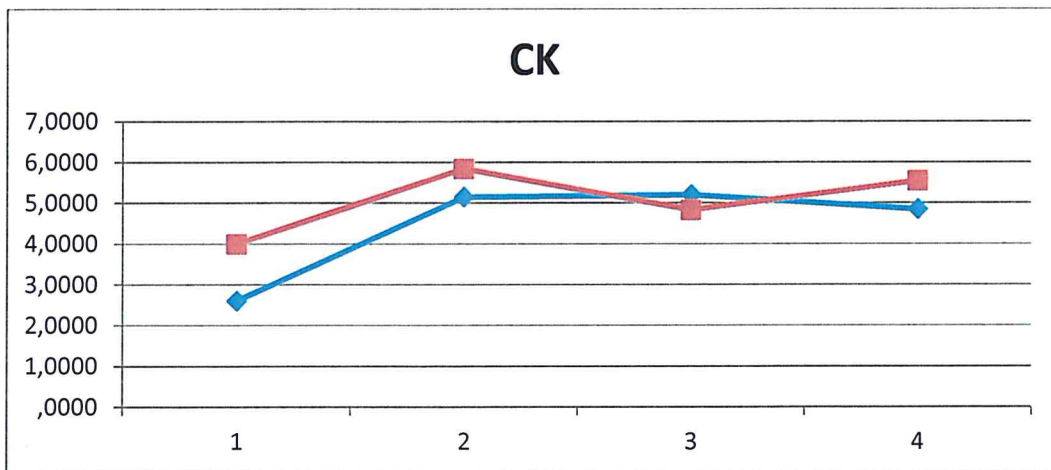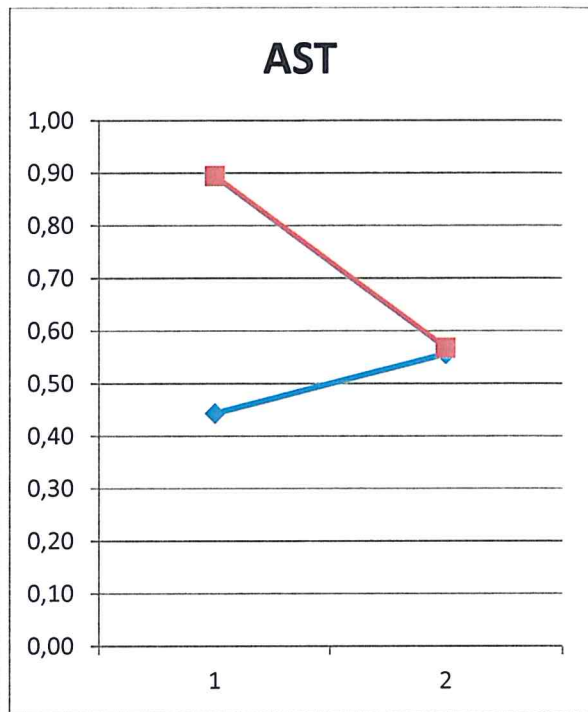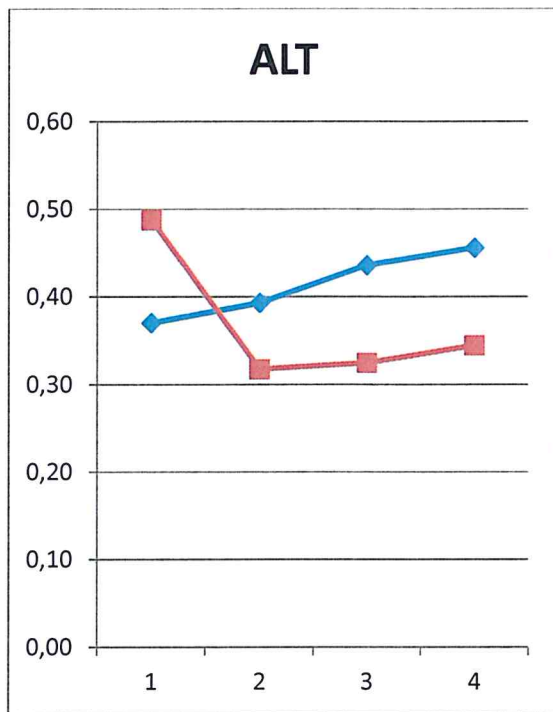
Conclusions: Several pieces of interesting information were found during the survey.

- The performance of the group of athletes using the bed showed a statistically significant improvement ($p = 0.018$) on the first day in the afternoon (2), while there was no improvement in the performance of the control group ($p = 0.612$). On the second day of testing, there was again an afternoon improvement in the performance of the group using the bed, but this improvement was not statistically significant ($p = 0.128$).
- Whereas the blood lactate concentrations reached (in samplings in 5th, 12th and 20th minute) in the group using the bed were stable during the whole testing, the control group showed signs of fluctuations occurring always after the afternoon test. The statistical significance at a level of 0.05, however, could not be manifested ($p = 0.063$).
- Differences were also found in the assessment of the total spectral performance, which got worse ($p = 0.043$) in the control group (Chart 4), but, on the contrary, improved ($p = 0.043$) in the reference group (Chart 5).

In these respects, it may be said that the andullation therapy bed affected the performances and the current condition of the probands who used it. No changes were manifested in the other analyzed parameters.

UNIVERZITA KARLOVA v Praze
Fakulta tělesné výchovy a sportu
laboratoř sportovní motoriky
José Martího 31, 162 52, Praha 6