# Abstract

**Title:** Changes of the catecholamins, serotonine and lactate levels during sport climbing on a climbing wall depending on the leader climber´s style of belaying.

**Goals:** The Goal of this thesis is to build on the bachelor thesis and develop its goals. The research is focused on a detection of blood hormonal changes before performance, right after it and after a 15- minute pacification depending on a style of a personal profile and style of belaying of the climbers. Hormonal changes have been compared during the performance on two climbing routes of the same difficulty and different styles of belaying.

**Methods:** The **r**andomized research sample consisted of 10 women, climbers, who climbed two routes using the OS (on sight) style on the level of maximum effort. One of the routes was climbed with clipping in protection points against the second route, which was climbed without protection points. The research was performed using a blood collection from v. brachialis and spinning off the blood plasma of the collected blood. Lactate was determined on Siemens Adria 1800 in a routine laboratory, serotonine was determined using LS-MS/MS with a gradient elution. Catecholamines were determined using LS-MS/MS with an isocratic elution. The survey composed of three psychological questionnaires (DMV, RCAI, Eysenck's personality questionnaire) was used further on. The questionnaires were evaluated according to appropriate score tables. The overall statistic evaluation of data was processed by using SPSS programme using ANOVA analysis. Pearson's correlation and Eta-square were used on the data. Individual graphs were created by using the MS Excel 2010 programme.

**Results:** Our study has shown a correlation between the psychological variables and measured hormone levels - the more anxiety and "AP" (=anxiety, which is a braking component in performance) the participants felt, the less hormone levels were coming out to blood (for example R=-0.697 - noradrenaline in measuring A and "AP"; R=-0.564 - serotonine in measuring B and anxiety). At the same time the reduced coming out of hormones connected to anxiety is caused by a low activation of the organism. The "positive" psychological components - activation, self confidence and motivation had a positive relation with the hormone levels - the higher activation, self confidence and motivation are, the more hormones come out to blood (for example R=0.567 - serotonine in measuring B and self confidence). The overall comparison of the hormone increase in measuring A and B

confirmed that in measuring B had higher increase than measuring A, while the values were statistically significant ( R=0.755, 0.673, 0.636). The overall increases and decreases in hormone levels in both measurements were most significant by noradrenaline (increase 0.763, decrease 0.591) and lactate (increase 0.584, decrease). On the contrary the lowest was by serotonine, especially at its increase (increase 0.009, decrease 0.423). All results were determined using Pearson's correlation coefficient and Eta-square.