CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)

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Project Number

S1404

Project Title

Remote Ischemic Preconditioning

Abstract

Objectives/Goals

To test the effect of remote ischemic preconditioning on the human body.

Methods/Materials

Baseline bleeding time, platelet aggregation, and blood samples were obtained from each subject prior to the remote ischemic preconditioning protocol. Baseline bleeding time and platelet aggregation testing was then carried out 4, 24, 48, 72 hours and 7 day intervals following the preconditioning stimulus.

Results

Bleeding time was recorded before the RIPC stimulus and at 4, 24, 48, 72 hours and 7 day intervals. At 0 hours, overall the average bleeding time was 4.34 minutes, in particular, females recorded an average bleeding time of 5 minutes, which was higher than that recorded in males of 4 minutes.

Following preconditioning, an increase in bleeding time was observed at early time-points followed by a decrease in bleeding time back to baseline by 48 hours, with a second peak observed at 72 hours. Overall, bleeding time was increased at 4 hours interval following RIPC; recording a mean of 5:300.05. However, when separated by gender, a significant difference was apparent in the peak bleeding time of males compared to females. In males, bleeding time peaked at the 4h time point (6:200.048); whereas, in females, bleeding time initially peaked at the 24 hour time point (5:520.14) followed by a larger peak at the 72 hour mark. There appeared to be a gender-related trend with females; they generally recorded higher bleeding times than males throughout the study

Conclusions/Discussion

Taken together, the findings of the present study suggest that RIPC increases bleeding time and decreases platelet aggregation and that such alterations may be gender dependent. These findings may have implications for the prophylactic treatment of heart attack and stroke.

Further studies are warranted to elucidate the exact window of efficacy and mechanism of protection of RIPC. Specifically, studies that investigate changes in gene expression in response to the RIPC stimulus may provide targets for clinical therapy. Such studies would enable us to pinpoint potential effector molecules responsible for the protection afforded by RIPC.

Summary Statement

Testing the effect of remote ischemic preconditioning on human body

Help Received

Used lab at UC Davis M.I.N.D Institute under supervision of Dr. Turner