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## Endothelial Permeability Compared at Various Times and Ages Post Skeletal Muscle Injury in Mice

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Capillary permeability following skeletal muscle injury is necessary for the entry of blood cells and plasma factors necessary for healing. However, it is unclear how aging and sex differences affect capillary permeability after muscle injury. **PURPOSE:** To compare endothelial permeability 48 hours post skeletal muscle injury between male and female mice at 1 month and 3 month of age. **METHODS:** Barium chloride ( $\text{BaCl}_2$ ) was injected into the left tibialis anterior (TA) to create a chemical injury and sodium chloride ( $\text{NaCl}$ ) was injected into the right leg as a control. Evans Blue (EB) dye was injected through the lateral tail vein at 48 hours post-injury. The mouse was sacrificed 30 min following EB injection and both TA's were removed, weighed and soaked in formamide to remove extravasated EB from the muscles. Absorbance of extravasated EB was measured. **RESULTS:** Permeability 48 hours post-injection was significantly elevated in the  $\text{BaCl}_2$  injected muscles of mice aged 4 weeks compared to  $\text{NaCl}$  Male:  $3.613 \pm 0.79$  vs.  $7.012 \pm 0.56$  ngEB/mgTA,  $p < 0.001$ ; Female:  $3.250 \pm 1.39$  vs.  $15.84 \pm 2.46$ ,  $p < 0.001$ . Permeability was also significantly higher in female TAs injected with  $\text{BaCl}_2$  compared to males ( $7.012 \pm 0.56$  vs.  $15.84 \pm 2.46$ ,  $p < 0.01$ ). Permeability 48 hours post-injection was significantly elevated in the  $\text{BaCl}_2$  injected muscles of mice aged 12 weeks compared to  $\text{NaCl}$  (Male:  $0.4845 \pm 0.14$  vs.  $3.62 \pm 1.39$  ngEB/mgTA,  $p < 0.05$ ; Female:  $2.24 \pm 0.239$  vs.  $6.926 \pm 2.9$ ,  $p < 0.01$ ). Permeability was also significantly higher in female TAs injected with  $\text{BaCl}_2$  compared to males ( $3.62 \pm 1.39$  vs.  $6.926 \pm 2.9$ ,  $p < 0.05$ ). Permeability values in  $\text{BaCl}_2$  injured TAs were lower at mice aged 1 month compared to mice aged 3 months (Male:  $7.012 \pm 0.56$  vs.  $3.62 \pm 1.39$  ngEB/mgTA; Female:  $15.84 \pm 2.46$  vs.  $6.926 \pm 2.9$  ngEB/mgTA). **CONCLUSION:** Both age and gender contribute to permeability 48 hrs post-skeletal muscle injury.