

#### **P24. Regional And Age-related Changes In Sulphated-Glycosaminoglycan Content Of The Aortic Valve: Functional Implications**

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**OBJECTIVES:** Sulphated-glycosaminoglycans (sGAGs) are important components of the valve extracellular matrix (ECM), which allow shearing between the valve layers and provide resistance against compressive forces. Heart valve ECM components have been shown to differ with age. This study investigates changes in sGAG content of the porcine aortic valve with age and their functional implications.

**METHODS:** Fresh aortic valve (AV) cusps were removed from juvenile (20 weeks) and adult (2.5-3 years) pig valves, separated into left, right and non-coronary cusps, then further into coapting edge, belly and basal regions. sGAGs were extracted and analysed using the Blyscan™ assay. The influence of sGAGs on mechanical properties was further evaluated by biaxial testing.

**RESULTS:** Juvenile AV possessed more sGAGs when compared with adult AV ( $2.1 \pm 0.2$  versus  $1.3 \pm 0.2$   $\mu\text{g}/\text{mg}$  wet tissue, mean  $\pm$  sem,  $p < 0.05$ ). Whereas left and non-coronary cusps sGAG content did not differ between juvenile and adult; juvenile AV right cusp contained more sGAGs than adult AV right cusp ( $2.0 \pm 0.3$  versus  $0.9 \pm 0.2$   $\mu\text{g}/\text{mg}$  wet tissue,  $p < 0.02$ ). This difference was a result of statistically greater amounts of sGAGs in the belly and basal regions of juvenile AV compared with adult AV ( $p < 0.05$ ).

**CONCLUSIONS:** sGAGs content decreases with age in regions of the cusps associated with high levels of stress. Further studies will investigate and identify the distribution and amount of specific proteoglycans in porcine AV and their relationship to levels of mechanical stress.