Characterization of optimal resting tension in human pulmonary artery

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Background: Different models are used to explore the underlying cellular and molecular mechanism of lung disease especially pulmonary vascular disease but most of the experiments were performed on animal models with little evidence available from humans.

Objective: The aim of this study is to provide a baseline optimal resting tension (ORT) value for performing experiments on human pulmonary artery rings and strips.

Methods: After REC approval, tissue samples were collected from lung surgery patients. Total 20 PA rings of internal diameter 2-4 mm and 2 mm long were prepared and mounted under physiological conditions in organ bath system and myograph. After equilibration at 1g basal tension, 40mM KCl induced active tension (AT) recorded. Samples washed for 30 minutes and repeated twice at 1g to confirm reproducibility. Further experiments performed at 1.2g, 1.4g, 1.6g, 1.8g and 2g basal tension and KCl induced AT recorded.

Results: In human pulmonary artery rings increasing the basal tension from 1.0 g to 1.6 g significantly augmented the 40mM KCl induced active tension. Increasing the active tension from 1.6 g to 2.0 g either decreased or plateaued the 40mM KCl induced response. Both organ bath and myograph shows similar result and confirmed that optimal RT for human pulmonary artery rings to be 1.61 g. The optimal resting tension in our experiment was 1.61 g for pulmonary artery ring.

Conclusion: More studies are needed to validate this data and also to identify if the optimal resting tension is different in different size pulmonary arteries.

Biography
Azar Hussain has completed his MBBS from Pakistan and completed his MRCS from Royal College of Surgeons of Edinburgh. He completed his MSc in Translational Research in cardiovascular medicine from university of Bristol. At present, he is pursuing his MD on ‘Effect of oxygen on small human pulmonary artery’ from Hull York Medical School. He is also pursuing a Diploma in Post-graduate research training and an MSc in healthcare improvement leadership. He published 5 papers in reputed journals and delivered talks on both national and international cardiothoracic forum.

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