

TITLE OF THE ABSTRACT : Validation of an algorithm to estimate vascular resistance and compliance in a perfused rat hind limb preparation

DEPARTMENT : Physiology

NAME OF THE CANDIDATE : Benjamin Jebaraj

DEGREE AND SUBJECT : MD Physiology

NAME OF THE GUIDE : Dr. Sathya Subramani

OBJECTIVES:

Validation of an algorithm to estimate vascular resistance and compliance using windkessel model of arterial system

METHODS:

Rats were anaesthetised, the abdominal organs were dissected and the descending aorta cannulated. The trunk was dissected below the level of diaphragm. The hindlimb preparation was then perfused with physiological ringer solution using an infusion pump. Pressure was recorded using a pressure transducer connected to CMCdaq data acquisition system. Since the flow rate of the infusion pump was known, the flow curve was derived. A beat to beat estimation of resistance and compliance was then obtained from the pressure recording using the estimated flow by windkessel method. Resistance was also calculated using the expression Mean Blood Pressure / Flow.

RESULTS:

The resistance estimated was compared to the values obtained from MBP/Flow. Pearson's correlation coefficient between the two was 0.97 ± 0.04 (n=6). The Mean Absolute Percentage Error of the estimated value was $8.9 \pm 3.5\%$.

A rat hindlimb preparation serves as a reliable experimental model for studying changes in vascular resistance and compliance

KEYWORDS:

Blood pressure, resistance, compliance, windkessel