Publication Brief

Cardiac Output Measurement by Ultrasound Dilution Analysis Comparing Peripheral Versus Central Artery in Dogs – A Pilot Study

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OBJECTIVE
To determine agreement between cardiac output measured by ultrasound dilution method using a peripheral distal pedal artery versus central femoral artery and compare cardiac output measurements to those using a lithium indicator.

STUDY
• Four anesthetized dogs were mechanically ventilated. temperature, end-tidal CO2 and isoflurane were kept constant.
• ULTRASOUND FLOW/DILUTION MEASUREMENTS: Catheters were inserted into the dogs femoral and distal pedal artery for central venous and peripheral cardiac output measurements. Transonic femoral and pedal CO were determined every 15 minutes in pacing mode.
• THERMODILUTION MEASUREMENTS: The jugular vein was dissected and a biventricular pacemaker was implanted. Lithium cardiac output was measured twice or three times for every mode.

RESULTS
• No significant difference (p=0.76) between Transonic femoral (mean = 2.82 units) cardiac output measurements and Lithium cardiac output measurements (mean = 2.94 units).
• No significant difference (p=0.36) between Transonic pedal (mean = 2.65 units) cardiac output measurements and Lithium cardiac output measurements.
• There was significant difference between Peristaltic Pump Flow/Dilution Sensor paced at 90 ppm in a single chamber mode (AAI) from the RAA, and in a dual chamber mode from the RVA, LVF, and simultaneously from the RVA and LVF (BiV).

STUDY’S CONCLUSIONS
• Transonic ultrasound dilution is a good method to evaluate cardiac output in dogs compared to lithium dilution.
• Both femoral and peripheral artery catheterization can be used.
• The limited number of dogs suggests that the results could be underpowered. Further studies are needed to confirm findings and to evaluate the capability of ultrasound dilution to monitor hemodynamic changes associated with disease or therapy.

COSTATUS® OBSERVATIONS
• A major advantage of ultrasound dilution is that it uses saline as an indicator.
• Indicator is not lost during passage through he heart and lungs.
• The flow/dilution sensors are resusable.
• The fact that both femoral and peripheral artery catheterization can be used makes COstatus a useful tool for clinical cases.

REFERENCES