MANAGEMENT OF HEMODYNAMICALLY COMPROMISED PATIENTS USING THE IMACOR CLARITEE PROBE – A FEASIBILITY STUDY

TM Merz[1], L Cioccari[1], HR Baur[2], J Takala[1]

1. Department of Intensive Care Medicine, University Hospital Bern (Inselspital), Bern, Switzerland
2. Herzklinik Bern, Spital Sonnenhof, Bern, Switzerland

INSELSPITAL
UNIVERSITÄTSSPITAL BERN
HOPITAL UNIVERSITAIRE DE BERNE
BERN UNIVERSITY HOSPITAL

Presented at ESICM, Lisbon, 2012, #0991

INTRODUCTION

- Parameters to guide hemodynamic management in ICU patients generally consist of blood pressures and flow measurements which might not accurately represent cardiac preload and contractility.
- Transesophageal echocardiography (TEE) offers the advantage of direct measurement of cardiac volumes and function.
- Conventional TEE is not always readily available in an ICU setting and requires extensive training.
- The use of a new miniaturized probe for hemodynamic TEE (hTEE) potentially provides a more rapid and simplified approach to monitoring of cardiac function.

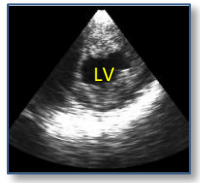
OBJECTIVES

- To assess the technical feasibility and quality of hemodynamic monitoring using hTEE in a large ICU setting by operators not formally trained in TEE.

METHODS - TRAINING

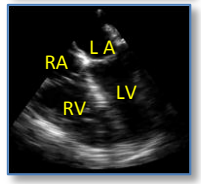
- 13 ICU staff specialist received 6 hours of one-to-one bedside training as hTEE operators. None had received formal training in TEE before the study. ICU-patients with hemodynamic instability were included.

METHODS - THE THREE hTEE VIEWS



Transgastric midesophageal short axis view (TG mid SAX):

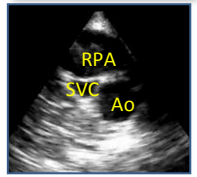
- FAC = % change in left ventricular (LV) area (diastole/systole):
- Rating of systolic LV function as normal, moderately decreased or severely decreased



Midesophageal four chamber view (ME 4 chamber):

- Rating of right ventricular (RV) size as dilated or not dilated

RA: right atrium; LA; left atrium



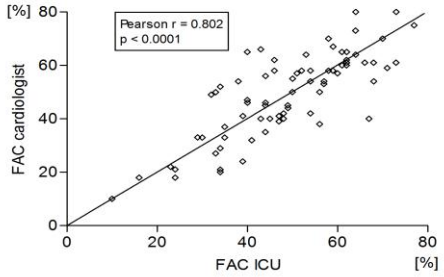
Midesophageal asc. aortic short axis view (ME asc aortic SAX):

- Rating of collapsibility of superior vena cava for presence or absence of hypovolemia

RPA: right pulmonary artery; SVC: superior vena cava; Ao: aorta

RESULTS

- 89 examinations in 23 patients.
- Quality the acquired loops rated as sufficient in 74 of 89 views (83%) for TG mid SAX and ME asc aortic SAX and 76 (85%) for ME four chamber by the independent cardiologist.
- Inter-rater reliability of measurements by ICU operators versus cardiologist was 0.802 (Pearsons r) for FAC; 0.614 (Kappa) for rating of systolic LV function and 0.632 (Kappa) for rating of RV dilatation (all p< 0.0001).
- Hypovolemia was not detected in any examination by ICU specialists or by the cardiologist.



Agreement (linear regression) of LV FAC measurements by ICU operators versus cardiologist

CONCLUSIONS

- Echocardiographic examinations by operators using hTEE after brief bed-side training are feasible and of sufficient quality in a majority of examined ICU patients.
- Substantial inter-rater reliability between hTEE operators and a trained cardiologist.
- Further studies are required to assess the impact of hemodynamic monitoring by hTEE on relevant patient outcomes.

Grant acknowledgments: The hTEE probes used for this study were provided by ImaCor Inc., USA