Service Priorities and Programmes

Electronic Presentations

Convention ID: 998
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Relationship between non-invasive haemodynamic monitoring and different patient positions

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Keywords:
cardiac output
Doppler
haemodynamic
patient position
stroke volume
stroke volume

Introduction

Early recognition of shock and evaluation of fluid resuscitation are very important in emergency settings. Ultrasonic Cardiac Output Monitor (USCOM) is a non-invasive measurement of haemodynamic parameters. Proper alignment of ultrasonic beam to aortic or pulmonary outflow tracts is the key to acquire optimal Doppler signals.

Objectives

This study aimed to investigate the effects of different patient positions on USCOM measurements.

Methodology

Chinese adults aged 18-60 were recruited. Using aortic and pulmonary approaches, two operators performed USCOM measurements on each subjects in supine, sitting, semirecumbent, passive leg raising (PLR) 20° and PLR 60° positions.

Result

A total of 60 subjects were recruited. Aortic stroke volume indexes (SVIs) and cardiac indexes (CIs) in sitting and semirecumbent positions were lower than those in other positions while pulmonary CIs were comparable to those in supine position. In sitting position, aortic Doppler signal scores were lower and time to obtain pulmonary Doppler signals was prolonged. Using pulmonary approach, the signal quality and time to obtain Doppler signals in semirecumbent position were similar to those in other positions. Time required to obtain Doppler signals using pulmonary approach was longer than that using aortic approach among all positions. To conclude, aortic approach requires less time and is therefore recommended for USCOM

measurements. However, it is not suggested to use aortic approach in sitting and semirecumbent positions as the measurements are not sufficiently reliable. For patients unable to maintain supine, operators can perform USCOM measurements using pulmonary approach in semirecumbent position.