Endotracheal tube cuff pressure deflations during monitoring by ICU staff – a simulation study

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Introduction and background

- Ventilator associated pneumonia (VAP) is the leading cause of infective nosocomial mortality in the intensive care unit (ICU).

- When using an endotracheal tube cuff one must balance between:

  - risk of tracheal ischaemia/necrosis

  - leak of gases/gastric contents

Introduction and background

- High volume low pressure (HVLP) endotracheal tubes (ETT) reduce the risk of pressure ischaemia/necrosis
- HVLP ETT allow pulmonary aspiration even when correctly inflated however (Mariyaselvam et al., 2017)
- Loss of cuff pressure increases pulmonary aspiration (Nseir et al., 2015).
- Cuff pressure should be maintained between 20-30cmH_20

Introduction and background

- 4-hourly pressure checks recommended
- Performed with:
  - Hand held manometer (most commonly)
  - Automatic cuff pressure monitors
- Commonly recognised that poor control of pressure release buttons of hand held manometers leads to transient deflation (Blanch 2004)

Aim

- To determine whether ICU staff transiently deflate the ETT cuff to below 20 cmH2O, on routine checking of the ETT cuff pressure using a handheld manometer/inflator device.

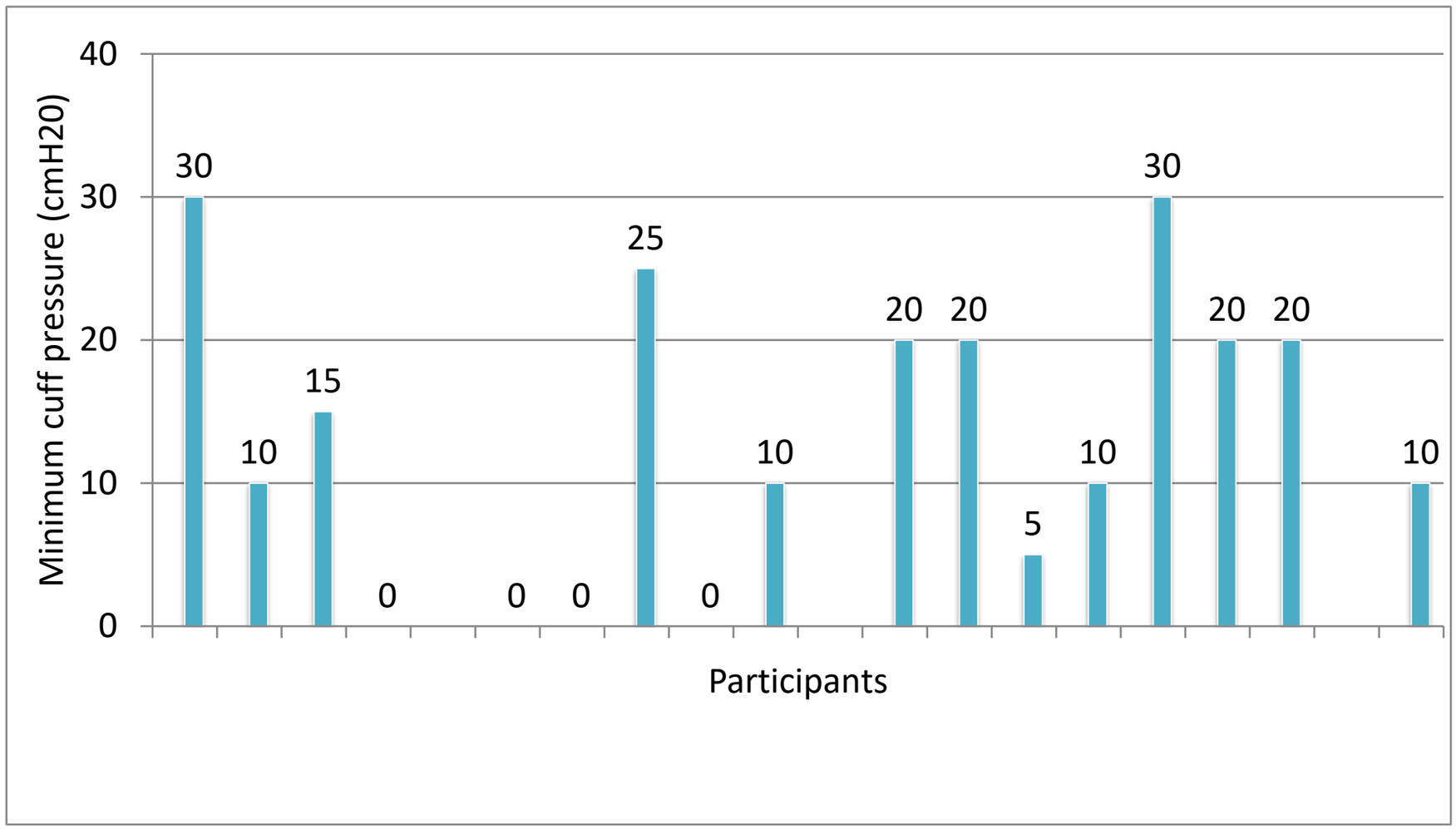
Methods

- Simulation study
- 20 staff
- ETT cuff inflated to 50 cmH_20
- Identify and correct to the appropriate pressure

Results

- 10/10 nurses and 7/10 doctors attempted cuff pressure check
- 80% nurses and 100% doctors inflated to correct pressure
- 60% of nurses and 57% doctors transiently deflated the cuff below target range when readjusting pressure

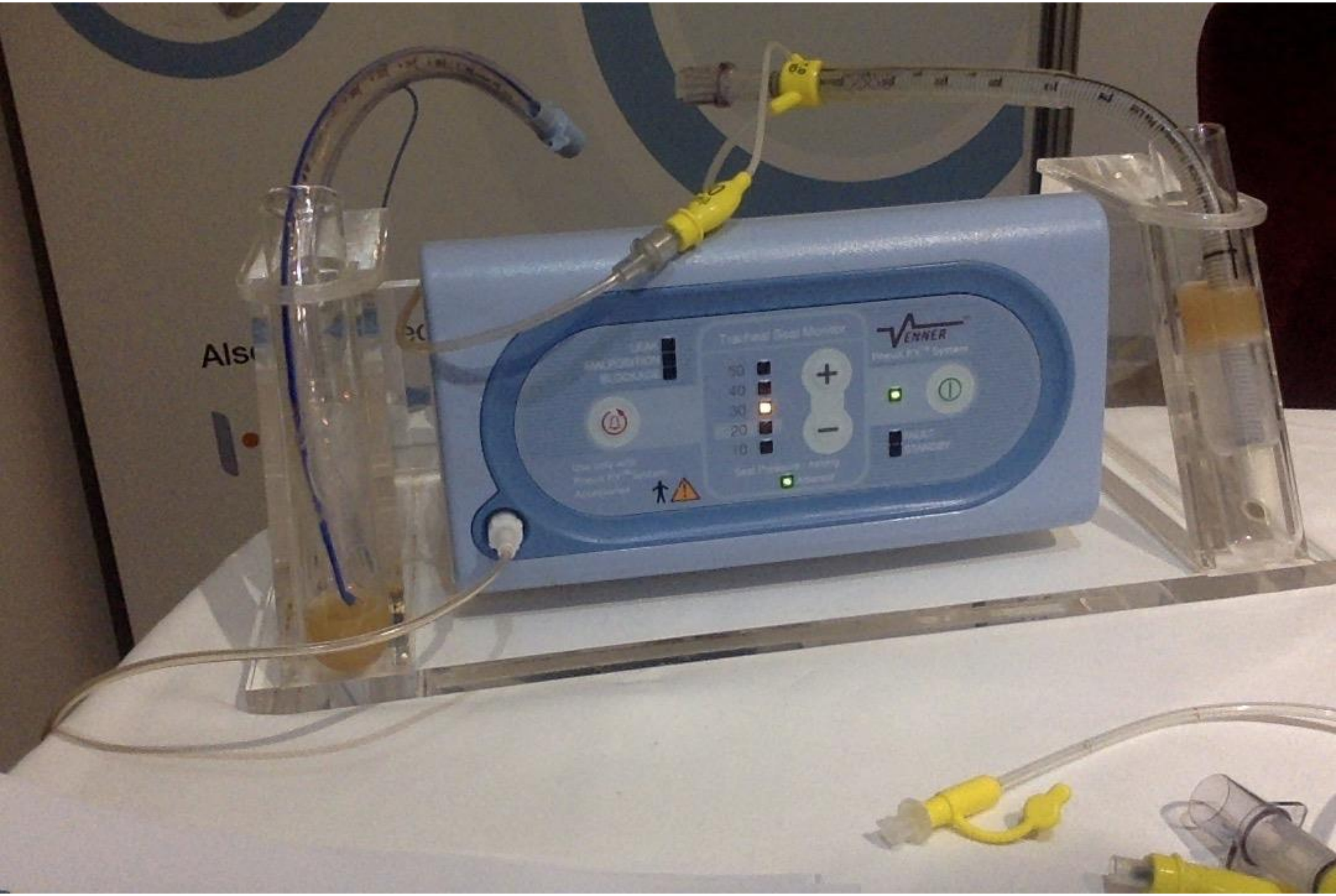
o show participant minimum cuff pressure deflation. (optimum >20 c



Conclusions

- 4 hourly measurements, poor device design and poor technique contribute to unintentional cuff deflation.

- Suggests need for improved training and supports use of continuous pressure monitoring (Nseir et al. 2015).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