A decision making tool and protocol for early cuff SpA21 deflation and one way valve inline for patients who are ventilated with a tracheostomy – a case series

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Introduction

Early cuff deflation and one way valve placement inline for patients who are ventilated with a tracheostomy allows for the restoration of verbal communication with concomitant psychological benefits, and enables assessment of bulbar function, delirium, pain, airway patency and speech and language problems.^{1,2}

Such an approach has not been shown to impact respiratory or ventilatory outcomes.³⁻⁵ Whilst the benefits may seem obvious, the practice of using one way valves inline has not been widely documented and there are a few published patient selection criteria or protocols, but no national guidelines.

Our multidisciplinary team designed a novel decision making tool and protocol to improve specialist service provision.

Objective

This was a retrospective audit of

- i) our decision making tool
- ii) our protocol for early cuff deflation, one way valve inline placement and ventilator adjustments in a specialist tertiary referral neuroscience intensive care unit.

Methods and Materials

The decision making tool and protocol guides the selection of patients and the approach to early cuff deflation (see below).

We performed a retrospective analysis of medical and therapy electronic patient records on consecutive patients with whom we had used this tool and protocol over a two year period from December 2018 - December 2020.

Data included diagnosis, primary mode of ventilation, aim of first cuff deflation, time tolerated for first cuff deflation (minutes), and number of days between first cuff deflation and decannulation.

Initial Tracheostomy Cuff Deflation on Patients who are Ventilated on the Intensive Care Unit at NHNN—a decision making tool Communication Prognosis of wean Laryngeal wean Aim: Does the patient have clinical or radiological signs of an active chest infection or have raised inflammatory markers? Not currently suitable for Is the patient responding to antibiotics? No cuff deflation If out of normal weaning Is the patient able to trigger the ventilator? target, please d/w senior Do they achieve normal weaning target of P0.1 of 2-4cmH20? therapist *NB. With the exception of patients with spinal cord injury , Yes Is the patients': Not currently No, PS < 14cm/H20 suitable for Is cuff deflation PEEP < 10cm/H20 cuff deflation required for urgent FiO2 < 0.40 communication? Yes` Proceed at risk In addition, for neuro-medical pawith agreement tients only: VC > 1 litre \Box Can secretions be of MDT managed with: Yes medication? Not currently Are secretions well managed? subglottic port? No suitable for regular suction during quick cuff down cuff deflation assessment? Do they have an effective cough? Is their negative flow rate >-60L Yes during a cough manoeuvre? Proceed at risk with Yes agreement of MDT Is the patient alert? Proceed with cuff deflation trial

Results

Eighteen consecutive patients were selected for early cuff deflation using the decision making tool with the following diagnoses: Encephalitis (5), COVID pneumonitis (5), Guillain Barre Syndrome (4), Intracerebral haemorrhage (1), Posterior communicating artery aneurysm (1), Motor Neurone Disease (1), Syringomyelia (1).

At the time of the initial assessment, the ventilation status was: 10 - CPAP/PS

- 4 SIMV
- 2 High Flow Oxygen Therapy
- 2 a period of self-ventilation.

The decision making tool defined the aim of the initial trial as "laryngeal wean" for 10 patients and "to facilitate communication" for 8.

The median time for one way valve use for the initial trial was 10 minutes (range 4-25).

There were no deleterious effects from following the protocol. All patients received further one way valve inline trials, and seventeen were weaned from the ventilator without respiratory compromise. One patient with Motor Neurone Disease remained ventilator dependent. Seventeen patients were subsequently decannulated (median 26.5 days after initial cuff deflation, range 12-209).

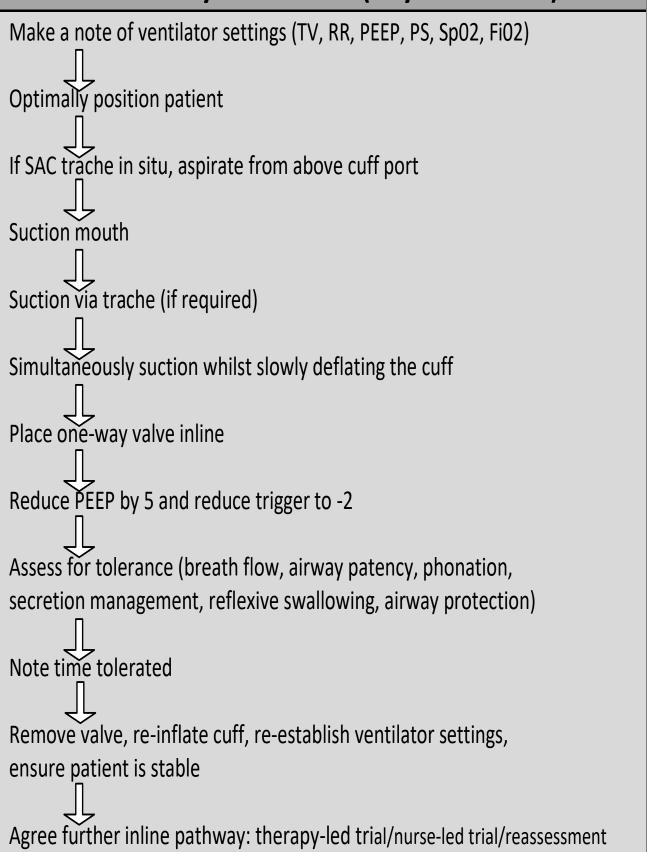
Conclusion

Eighteen neurointensive care patients were successfully able to use a one way valve inline in accordance with our decision making tool and protocol.

It is hoped that our practice will prompt a wider discussion amongst different intensive care multidisciplinary teams about careful patient selection and judicious use of a one way valve inline.

We plan to collect patient's experience of the practice and to update our protocol with emerging evidence around optimal ventilator settings for using one way valves inline.

NHNN Cuff deflation protocol for inline ventilator with Passy Muir Valve (Physio and SLT)



References

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