Temporary limited peak pressure increase following endotracheal suctioning in ventilated patients.

Published: 20-05-2008
Last updated: 09-05-2024

the aim of the study is to assess whether short lived limited increases in airway pressure are sufficient to combat ET suction induced hypoxemia

Ethical review	Approved WMO
Status	Pending
Health condition type	Bronchial disorders (excl neoplasms)
Study type	Interventional

Summary

ID

NL-OMON31131

Source
ToetsingOnline

Brief title
pressure increase following endotracheal suctioning

Condition

- Bronchial disorders (excl neoplasms)

Synonym
respiratory insufficiency

Research involving
Human

Sponsors and support

Primary sponsor: Vrije Universiteit Medisch Centrum
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: (endo)tracheal, Intubation, mechanical, Suction, Ventilation

Outcome measures

Primary outcome

duration and depth of desaturation, changes in lung volume measured with

respiratory inductive plethysmography

Secondary outcome

none

Study description

Background summary

Mechanical ventilation is one of the mainstays of paediatric intensive care. Part of routine care for ventilated patients is frequent endotracheal (ET) suctioning in order to remove bronchial secretions. This procedure may lead to a significant, but usually transient, loss of lung volume and a concomitant decrease in oxygenation. Literature data suggest the beneficial effect of temporarily increasing airway pressures to reopen collapsed lung regions. The optimal method for this rerectuitment of lung volume has not yet been established however. Titration of pressures based on the quasi static pressure volume curve of the respiratory system has been suggested, but this method is labour intensive, lacks regional information and has no real scientific foundation (5). Other studies suggest the use of high inspiratory and expiratory pressures during a brief period. These manoeuvres may have significant unwanted circulatory effects .
In our clinical practice, we use manoeuvres aimed at recruiting lung volume, in order to ventilate the respiratory in its most compliant situation, but given the unwanted side effects of application of high airway pressures, we try to avoid the procedure when possible. For this reason, we do not routinely apply high pressure recruitment procedures following ET suctioning, but temporarily increase peak airway pressures with 2 cm H2O, based on the knowledge that recruitment is not only pressure, but also time dependent; lower pressures for a longer period of time might be effective as pressure pulses in recruiting lung volume. This practice however lacks scientific foundation. We therefore designed this study, in order to assess the safety and efficacy of temporary limited peak pressure increase following ET suctioning in ventilated paediatric

patients.

Study objective

the aim of the study is to assess whether short lived limited increases in airway pressure are sufficient to combat ET suction induced hypoxemia

Study design

Suction procedure: ET suctioning will be performed with 2 hour intervals, as is routine in our department. When needed, based on clinical evaluation, time between may be reduced. The catheter will be inserted to the tip of te ET tube. Suction will be applied at a pressure of -100 mmHg (13.3 kPa) for 6 seconds while simultaneously withdrawing the catheter. Ventilator setting changes will be according to protocol. Saline will not be installed during ET suctioning.
During measurements, patients will not be handled, and ventilator settings will only be changed as dictated by this protocol. During the suction protocol, patients will be ventilated in a pressure controlled mode, according to randomisation peak pressure above PEEP will be maintained at baseline level or will be increased by 2 cm H2O for 10 minutes following initiation of ET suctioning.
Changes in lung volume will be estimated from 30 sec. before (baseline) ET suctioning until 600 sec following ET suctioning using continuous respiratory inductive plethysmography (11). Recordings will be devided in four phases: baseline (pre suction), suction (from the onset of application of negative pressure), immediate post suction (first 60 seconds following withdrawal of the catheter) and late post suction (a period until 10 minutes following withdrawal of the suction catheter). At the end of each phase, chages in end expiratory lung volume will be determined and expressed relative to the value at baseline.
Pulseoxymetry values will be noted and written down at baseline (prior to the introduction of the suction catheter), at the end of each period as described above, additionally time between initiation of ET suctioning (phase 2) and restoration of saturation at its baseline will be recorded.

Intervention

intervention: 10 minutes increase of inspiratory pressure,
control: unchanged ventilator settings.

Study burden and risks

none expected

Contacts

Public
Vrije Universiteit Medisch Centrum

Postbus 7057
1007 MB Amsterdam
Nederland
Scientific
Vrije Universiteit Medisch Centrum

Postbus 7057
1007 MB Amsterdam
Nederland

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adolescents (12-15 years)
Adolescents (16-17 years)
Children (2-11 years)

Inclusion criteria

* Mechanical ventilation, pressure controlled mode or volume control and possibility to temporarily change to PC.
* Supplemental oxygen needed (FiO2 > 0.4, to obtain a percutaneous arterial oxygenation (SaO2) > 90%)
* Closed inline suction system in place
* Proven deoxygenation following ET suction (SaO2 decrease > 5%)
* Written informed consent

Exclusion criteria

* No closed inline suction system in place
* FiO2 < 0.4
* detubation expected within 8 hours.

Study design

Design

Study phase:	2
Study type:	Interventional
Intervention model:	Crossover
Allocation:	Randomized controlled trial
Masking:	Open (masking not used)

Primary purpose: Treatment

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-10-2007
Enrollment:	20
Type:	Anticipated

Ethics review

Approved WMO

Application type:	First submission
Review commission:	METC Amsterdam UMC

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL19534.029.07