Clinical Trial Protocol
Iranian Registry of Clinical Trials

16 Sep 2026

Comparison the effect of applying “expiratory rib cage compression” and “manual percussion” before suction on respiratory parameters in patients under mechanical ventilation

Protocol summary

Study aim

Comparison the effect of applying “expiratory rib cage compression” and “manual percussion” before suction on respiratory parameters in patients under mechanical ventilation

Design

Randomized cross-over Clinical Trials, with A and B intervention groups will be performed on 46 patients.The letter A is written on 23 cards and the letter B on the other 23 cards. One of these two cards is randomly selected for each patient. Patients with card A enter Group A and patients with card B enter Group B.

Settings and conduct

The intensive care units of Kowsar Hospital will be used as a research environment. Both interventions will be performed by the researcher on the same day with an interval of 3 hours (to neutralize the previous intervention) and changes in study variables will be evaluated and recorded in the 4 interval before, 1,5, 25 minutes after endotracheal suctioning.

Participants/Inclusion and exclusion criteria

Inclusion criteria: intubated patients under mechanical ventilation for at least 48 h, not needing more than 2 times suction per shift, patients with stable hemodynamic parameters, reversible gastric secretion less than 100 ml before Intervention, aged 18 to 65 years Exclusion criteria: Respiratory distress, pneumothorax and Fractures of ribs, sternum and chest، chest burns and surgery, dysrhytmia and heart disease, Abscess and lung cyst.

Intervention groups

Intervention Group A: First, the Manual percussion and then the expiratory rib cage compression will be performed. Intervention Group B: First, the expiratory rib cage compression and then Manual percussion will be performed. Both interventions will be performed by the researcher in one day, observing a time interval of 3 hours (to neutralize the previous intervention).

Main outcome variables

End tidal CO2 (ET-CO2), arterial oxygen saturation, respiratory rate, pulmonary Compliance and airway resistance

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20191030045281N1**
Registration date: **2020-06-25, 1399/04/05**
Registration timing: **registered_while_recruiting**

Last update: **2020-06-25, 1399/04/05**
Update count: **0**

Registration date

2020-06-25, 1399/04/05

Registrant information

Name
Maryam Rasuli
Name of organization / entity
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Iran (Islamic Republic of)
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+98 87 3424 0418
Email address
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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2020-05-21, 1399/03/01

Expected recruitment end date

2020-09-22, 1399/07/01

Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Comparison the effect of applying “expiratory rib cage compression” and “manual percussion” before suction on respiratory parameters in patients under mechanical ventilation

Public title
Comparison the effect of applying “expiratory rib cage compression” and “manual percussion” before suction on respiratory parameters
Purpose
Prevention
Inclusion/Exclusion criteria
Inclusion criteria:
intubated patients Patients under mechanical ventilation with volumetric mode For at least 48 hours under mechanical ventilation not needing more than 2 times suction per shift patients with stable hemodynamic parameters reversible gastric secretion less than 100 ml before Intervention Age between 18 and 65 years
Exclusion criteria:
Respiratory distress pneumothorax and Fractures of the ribs, sternum and chest chest burns and surgery dysrhythmia and heart disease Abscess and lung cyst
Age
From **18 years** old to **65 years** old
Gender
Both

Phase
N/A
Groups that have been masked
No information
Sample size
Target sample size: **46**
Randomization (investigator's opinion)
Randomized
Randomization description
Group A is a group that will be carried out first by manual percussion and then expiratory rib cage compression. Group B group that will be performed first by expiratory rib cage compression and then manual percussion . The letter A is written on 23 cards and the letter B on the other 23 cards. One of these two cards is randomly selected for each patient. Patients with card A enter Group A and patients with card B enter Group B.
Blinding (investigator's opinion)
Not blinded
Blinding description
Placebo
Not used
Assignment
Crossover
Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee
Name of ethics committee
Ethics committee of Kurdistan University of Medical Sciences
Street address
Kurdistan University of Medical Sciences Campus, Pasdaran Ave, Sanandaj
City
Sanandaj
Province
Kurdistan
Postal code
13446-66177
Approval date
2020-03-14, 1398/12/24
Ethics committee reference number
IR.MUK.REC.1398.293

Health conditions studied

1

Description of health condition studied
Patients under mechanical ventilation
ICD-10 code
ICD-10 code description

Primary outcomes

1

Description
end Tidal CO2
Timepoint
Exhaled CO2 is measured 4 times: before and minutes 1, 5 and 25 minutes after endotracheal suctioning.
Method of measurement
Using Capnography Probe

2

Description
Oxygen saturation (SPO2)
Timepoint
Oxygen saturation (SPO2) is measured 4 times: before and minutes 1, 5 and 25 minutes after endotracheal suction
Method of measurement
Using a pulse oximeter device (via monitor view)

3

Description
Pulmonary compliance

Timepoint
Pulmonary compliance is measured 4 times: before and minutes 1, 5 and 25 minutes after endotracheal suction
Method of measurement
Through viewing the ventilator screen

4

Description
Airway resistance
Timepoint
Airway resistance measured 4 times: before and minutes 1, 5 and 25 minutes after endotracheal suction
Method of measurement
Through viewing the ventilator screen

5

Description
Respiratory rate
Timepoint
Respiratory rate is measured 4 times: before and minutes 1, 5 and 25 minutes after endotracheal suction
Method of measurement
Total spontaneous breathing and ventilator-provided breathing per minute by viewing the ventilator screen

Secondary outcomes

empty

Intervention groups

1

Description
Group A is the group that will do the manual percussion first and then expiratory rib cage compression. In the manual percussion procedure, the hands are cupped and all fingers are folded and the wrist joint is opened and performed at speeds of 100 to 120 times per minute. In the expiratory rib cage compression,gradually compressed the end and lateral parts of patients' rib cage during expiration by his hands. This technique was bilaterally performed, and in the end of expiration, the compression was released from the patients' rib cage to let them have a free inspiration. Both interventions will be performed by the researcher in one day with a 3-hour interval (to neutralize the previous intervention), respectively. Respiratory parameters: increased end-expiratory CO2, pulmonary compliance and hemoglobin saturation, and respiratory rate and airway resistance in patients undergoing mechanical ventilation in the ICU will be assessed before and 1, 5 and 25 minutes after endotracheal suctioning.
Category
Prevention

2

Description
Group B is the group that first will do the expiratory rib cage compression and then manual percussion before the suction. In the manual percussion procedure, the hands are cupped and all fingers are folded and the wrist joint is opened and performed at speeds of 100 to 120 times per minute. In the expiratory rib cage compression,gradually compressed the end and lateral parts of patients' rib cage during expiration by his hands. This technique was bilaterally performed, and in the end of expiration, the compression was released from the patients' rib cage to let them have a free inspiration. Both interventions will be performed by the researcher in one day with a 3-hour interval (to neutralize the previous intervention), respectively. Respiratory parameters: increased end-expiratory CO2, pulmonary compliance and hemoglobin saturation, and respiratory rate and airway resistance in patients undergoing mechanical ventilation in the ICU will be assessed before and 1, 5 and 25 minutes after endotracheal suctioning.
Category
Prevention

Recruitment centers

1

Recruitment center
Name of recruitment center
Kosar Medical Center of Sanandaj
Full name of responsible person
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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
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Full name of responsible person
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Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
Yes
Title of funding source
Sanandaj University of Medical Sciences
Proportion provided by this source
100
Public or private sector
Public
Domestic or foreign origin
Domestic
Category of foreign source of funding
empty
Country of origin
Type of organization providing the funding
Academic

Person responsible for general inquiries

Contact
Name of organization / entity
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Full name of responsible person
Maryam Rasuli
Position
MSc Student of Critical Care Nursing
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Sharing plan

Deidentified Individual Participant Data Set (IPD)
Undecided - It is not yet known if there will be a plan to make this available
Study Protocol
Undecided - It is not yet known if there will be a plan to make this available
Statistical Analysis Plan
Undecided - It is not yet known if there will be a plan to make this available
Informed Consent Form
Undecided - It is not yet known if there will be a plan to make this available
Clinical Study Report
Undecided - It is not yet known if there will be a plan to make this available
Analytic Code
Undecided - It is not yet known if there will be a plan to

make this available	Undecided - It is not yet known if there will be a plan to make this available
Data Dictionary	