Clinical Trial Protocol
Iranian Registry of Clinical Trials

24 Jul 2026

Evaluation of the protective effect of melatonin and N-acetyl cysteine on colistin-induced nephrotoxicity in critically ill patients: A randomized, controlled clinical trial

Protocol summary

Study aim

Evaluation of the melatonin and N-acetyl cysteine role on colistin-induced acute nephrotoxicity in critically ill patients

Design

The randomized, parallel-group, controlled clinical trial, among 51 patients (17 patients in each group of melatonin, N-acetyl cysteine, or control) was designed. Card shuffling was used for randomization.

Settings and conduct

This randomized clinical trial was designed to evaluate the effect of melatonin (3 mg tablet twice daily for 5 days) and N-acetyl cysteine in the prevention of colistin-induced acute renal injury and compared it with control group. This study was conducted among critically ill patients admitted to the intensive care unit (ICU) of Alzahra hospital in Isfahan, Iran. Renal injury was assessed according to urinary neutrophil gelatinase-associated lipocalin (NGAL) and serum creatinine changes.

Participants/Inclusion and exclusion criteria

Inclusion criteria: Adult patients (more than 18 years) who received intravenous colistin Creatinine clearance ≥ 45 ml/min at study recruitment Oral tolerance to the drug Exclusion criteria: Receiving intravenous collistin or melatonin for at least 2 weeks before study recruitment Acute kidney injury before study recruitment

Intervention groups

Melatonin group: Administration of melatonin tablet (3 mg) twice daily for 5 days N-acetyl cysteine group: Administration of NAC tablet (600 mg) twice daily for 5 days Control group: No intervention was conducted in addition to standard care to prevent colistin-induced nephrotoxicity

Main outcome variables

Urinary level of neutrophil gelatinasee-associated lipocalin, serum Creatinin level

General information

Reason for update

The high prevalence of N-acetyl cysteine (NAC) prescription for critically ill patients in our study setting, could be an important confounding factor for final analysis due to NAC's potential benefit of reducing the urinary neutrophil gelatinase-associated lipocalin (NGAL) level. Therefore, we decided to compare its effect on colistin-induced nephrotoxicity prevention in the separated group.

Acronym

IRCT registration information

IRCT registration number: **IRCT20150221021159N3**
Registration date: **2020-06-23, 1399/04/03**
Registration timing: **registered_while_recruiting**

Last update: **2021-04-05, 1400/01/16**
Update count: **1**

Registration date

2020-06-23, 1399/04/03

Registrant information

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Shadi Farsaei
Name of organization / entity
Isfahan University of Medical Sciences
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Recruitment status

Recruitment complete

Funding source

Expected recruitment start date

2018-12-09, 1397/09/18

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

Evaluation of the protective effect of melatonin and N-acetyl cysteine on colistin-induced nephrotoxicity in critically ill patients: A randomized, controlled clinical trial

Public title

The effect of melatonin and N-acetyl cysteine on colistin-associated nephrotoxicity

Purpose

Prevention

Inclusion/Exclusion criteria

Inclusion criteria:

Adult patients (more than 18 years) who received intravenous colistin. Creatinine clearance ≥ 45 ml/min at study recruitment Oral tolerance to the drug

Exclusion criteria:

Receiving intravenous collistin or melatonin for at least 2 weeks before study recruitment Acute kidney injury before study recruitment

Age

From **18 years** old

Gender

Both

Phase

3

Groups that have been masked

No information

Sample size

Target sample size: **51**

Randomization (investigator's opinion)

Randomized

Randomization description

Numbers from 1 to 51 were written on the separated cards, and 17 cards were assigned to each group of melatonin, N-acetyl cysteine, and control. These cards were placed in the box, and one card was selected randomly from these shuffled cards for each eligible patient on the study recruitment day. According to the number of the chosen card, patients were categorized into a specific group.

Blinding (investigator's opinion)

Not blinded

Blinding description

Placebo

Not used

Assignment

Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee

Ethics committee of Isfahan University of Medical Sciences

Street address

Department of clinical pharmacy and pharmacy practice, faculty of pharmacy, Isfahan University of Medical Sciences, Hezar Jarib Ave. Isfahan University of Medical Sciences.

City

Isfahan

Province

Isfehan

Postal code

۷۳۴۶۱-۸۱۷۴۶

Approval date

2018-12-05, 1397/09/14

Ethics committee reference number

IR.MUI.MED.REC.1397.151

Health conditions studied

1

Description of health condition studied

Acute kidney failure

ICD-10 code

N17.9

ICD-10 code description

Acute kidney failure, unspecified

Primary outcomes

1

Description

Acute kidney failure based on changes of urinary Neutrophil gelatinase-associated lipoccalin (NGAL) and serum creatinine levels.

Timepoint

Measurement of urinary NGAL and serum creatinine at the initial of study (before initiation of colistin or intervention) and 5 days after intervention

Method of measurement

ELISA Kit

Secondary outcomes

empty

Intervention groups

1

Description
First intervention group: Melatonin tablets made in nature made company are administered orally at the dose of 3 mg twice daily for 5 days, on the same date of starting colistin.
Category
Prevention

2

Description
Control group: No intervention was conducted in addition to standard care to prevent colistin-induced nephrotoxicity
Category
N/A

3

Description
Second intervention group: N-acetyl cysteine tablet are administered orally at the dose of 600 mg twice daily for 5 days, on the same date of starting colistin.
Category
Prevention

Recruitment centers

1

Recruitment center
Name of recruitment center
AlZahra hospital
Full name of responsible person
Shadi Farsaei
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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
Esfahan 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
Esfahan University of Medical Sciences
Full name of responsible person
Shadi Farsaei
Position
Associate professor
Latest degree
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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
Data Dictionary
Undecided - It is not yet known if there will be a plan to make this available