

Clinical Trial Protocol

Iranian Registry of Clinical Trials

28 May 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 \geq 45 ml/min at study recruitment Oral tolerance to the drug Exclusion criteria: Receiving intravenous colistin 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 gelatinase-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

Name

Shadi Farsaei

Name of organization / entity

Isfahan University of Medical Sciences

Country

Iran (Islamic Republic of)

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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 \geq 45 ml/min at study recruitment Oral tolerance to the drug
Exclusion criteria:
Receiving intravenous colistin 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

Isfahan

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 lipocalin (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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No.53, 29th Alley , Chahar Bagh Paen Ave., Isfahn, Iran

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Esfahan University of Medical Sciences

Full name of responsible person

Shaghayegh Haghjou Javanmard

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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

Specialist

Other areas of specialty/work

Medical Pharmacy

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Person responsible for scientific inquiries

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Position

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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