# Clinical Trial Protocol
# Iranian Registry of Clinical Trials

28 Jul 2026

## Evaluation of the effect of use of budesonide nebulizer on reducing bronchopulmonary dysplasia in preterm infants less than 32 weeks a randomized of clinical trial

## Protocol summary

**Study aim**

Evaluate the efficacy of inhaled budesonide in preterm infants for preventing BPD. Secondary objectives were assessing its effects on the duration of respiratory support, hospital stay, the incidence of severe BPD, and mortality before 36 post-menstrual age (PMA). We also evaluated related complications

**Design**

Clinical trial with control group with parallel groups, Double-blind, Randomized, Phase 3 on 70 patients.

**Settings and conduct**

kamali hospital

**Participants/Inclusion and exclusion criteria**

Preterm infants (25–32 weeks GA), ≤12 hours old, requiring respiratory support, were eligible. Exclusion criteria included birth weight ≤500 g or >1500 g, major congenital anomalies, pneumothorax, or early-onset sepsis prior to randomization. All eligible infants meeting these conditions were enrolled in the study.

**Intervention groups**

Eligible infants received the first dose within 24 hours of birth. Inhaled budesonide or placebo (normal saline) was nebulized every 12 hours for 7 days. Delivery method depended on respiratory support type. The protocol ensured consistent dosing and full blinding across all stages, with indistinguishable appearance of both solutions.

**Main outcome variables**

Bronchopulmonary dysplasia/Mortality rate/Severity of Bronchopulmonary dysplasia/Need for supplemental oxygen/duration of mechanical ventilation duration of non-invasive ventilation/Intraventricular hemorrhage/Incidence of early and late onset sepsis

## General information

**Reason for update**

Due to practical limitations encountered during the data collection process and a lower-than-anticipated number of enrolled participants, a revision of the initially estimated sample size became necessary. To obtain a more accurate and realistic estimation, the G*Power statistical software was used. The recalculation was performed based on a statistical power of 0.80, a significance level (α) of 0.05, and the expected effect size. As a result, the sample size was adjusted to reflect feasible implementation within the available resources and study conditions. This revision was made to maintain scientific rigor and ensure the generalizability and statistical validity of the study findings. The updated sample size has been reflected in the final IRCT registration. In addition, and in line with the principles of proper clinical trial design, the randomization and blinding methods used in the study were clarified and updated. These revisions were made to ensure adherence to appropriate procedures for random allocation and multi-level blinding (including physicians, data analysts, outcome assessors, and clinical staff). Detailed information was provided regarding the use of the Sealed Envelope web-based software for randomization with a 1:1 allocation ratio, as well as the procedures implemented to preserve blinding throughout all stages of the trial, including drug preparation, administration, outcome assessment, and data analysis. These updates were made to enhance scientific transparency, improve reproducibility, and strengthen the methodological quality of the trial as registered in IRCT. Moreover, to better target a high-risk neonatal population and reduce heterogeneity in the study sample, an additional exclusion criterion was introduced. Infants with a birth weight greater than 1500 grams were excluded from the study. This adjustment aimed to focus the investigation on preterm infants at higher risk for bronchopulmonary dysplasia (BPD), thereby improving the precision of the findings and their clinical relevance. This change has also been incorporated into the updated

IRCT registration.

**Acronym**

**IRCT registration information**

IRCT registration number: **IRCT20230823059227N1**
Registration date: **2023-09-13, 1402/06/22**
Registration timing: **prospective**

Last update: **2025-07-21, 1404/04/30**
Update count: **1**

**Registration date**

2023-09-13, 1402/06/22

**Registrant information**

**Name**

Kobra Hosseini

**Name of organization / entity**

Alborz University of medical science

**Country**

Iran (Islamic Republic of)

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+98 26 3434 9590

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**Recruitment status**

**Recruitment complete**

**Funding source**

**Expected recruitment start date**

2023-09-22, 1402/06/31

**Expected recruitment end date**

2024-08-19, 1403/05/29

**Actual recruitment start date**

empty

**Actual recruitment end date**

empty

**Trial completion date**

empty

**Scientific title**

Evaluation of the effect of use of budesonide nebulizer on reducing bronchopulmonary dysplasia in preterm infants less than 32 weeks a randomized of clinical trial

**Public title**

"Effect of budesonide nebulizer on reducing BPD"

**Purpose**

Prevention

**Inclusion/Exclusion criteria**

**Inclusion criteria:**

Premature neonates between 24 and 32 weeks

**Exclusion criteria:**

Weight Less than 500 grams or more than 1500 grams Neonate with fatal congenital abnormalities or disorders and congenital heart and lung diseases Pneumothorax prior to randomization clinical evidence of early onset sepsis prior to randomization

**Age**

To **1 day** old

**Gender**

Both

**Phase**

3

**Groups that have been masked**

- Participant
- Care provider
- Investigator
- Outcome assessor
- Data analyser

**Sample size**

Target sample size: **70**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

Once the eligibility of participants was confirmed and prospective consent obtained, infants were randomly assigned to either receive inhaled budesonide or placebo using the Sealed Envelope web-based randomization software (https://www.sealedenvelope.com) with an allocation ratio of 1:1.

**Blinding (investigator's opinion)**

Double blinded

**Blinding description**

To maintain blinding, physicians, data analysts, outcome assessors, and trial investigators were blinded to the randomization group throughout the study. The study medications were prepared by a designated clinical manager who was not involved in clinical care. Both the budesonide and placebo solutions were colorless, indistinguishable in appearance, and prepared in equal volume. The designated clinical manager labeled study medications based on the patient’s code. Outcome data were recorded by a neonatal specialist who was unaware of the administered drugs. All clinical staff, caregivers, the principal investigator and data analysts were blinded during data collection and analysis.

**Placebo**

Used

**Assignment**

Parallel

**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

**Ethics committee**

**Name of ethics committee**

Ethics committee of Alborz University of Medical Science

**Street address**

Alborz University of Medical Science, Official settlement, North Taleghani boulevard, Taleghani Square, Karaj, Alborz Province

**City**

karaj

**Province**

Alborz

**Postal code**

3147734568

**Approval date**

2023-09-08, 1402/06/17

**Ethics committee reference number**

IR.ABZUMS.REC.1402.162

## Health conditions studied

### 1

**Description of health condition studied**

Bronchopulmonary dysplasia

**ICD-10 code**

P27.1

**ICD-10 code description**

Bronchopulmonary dysplasia originating in the perinatal period

## Primary outcomes

### 1

**Description**

Bronchopulmonary dysplasia

**Timepoint**

36 weeks PMA or discharge to home, whichever occurred first

**Method of measurement**

According to the NICHD2001 ,The need for supplemental oxygen at 28 PMA

### 2

**Description**

mortality

**Timepoint**

daily

**Method of measurement**

until discharge

## Secondary outcomes

### 1

**Description**

The duration of hospitalization

**Timepoint**

Discharge Time

**Method of measurement**

The number of days of hospitalization records

### 2

**Description**

Duration of need for oxygen

**Timepoint**

Daily

**Method of measurement**

Days count before O2 discontinue

### 3

**Description**

duration of non-invasive ventilation

**Timepoint**

Day

**Method of measurement**

days of non-invasive ventilation

### 4

**Description**

duration of mechanical ventilation

**Timepoint**

daily

**Method of measurement**

days of mechanical ventilation

### 5

**Description**

intraventricular hemorrhage

**Timepoint**

daily

**Method of measurement**

based on cranial ultrasonography

## Intervention groups

### 1

**Description**

Intervention group: treatment with inhaler Budesonide through jet nebulizer (250 mcg every 12 hours) for 7 days.

**Category**

Prevention

### 2

**Description**

Control group:prescribe 3 cc of 0.9% normal saline nebulizer every 12 hours for 7 days.

**Category**

Placebo

## Recruitment centers

### 1

**Recruitment center**

**Name of recruitment center**

Kamali Hospital( Karaj)

**Full name of responsible person**

Dr Hani Milani

**Street address**

KAMALI Hospital, Kamali alley, Shahid Beheshti st, Shohada Squ,

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## Sponsors / Funding sources

**1**

**Sponsor**

**Name of organization / entity**
Karaj University of Medical Sciences

**Full name of responsible person**
Dr Hani Milani

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**Grant name**

**Grant code / Reference number**

**Is the source of funding the same sponsor organization/entity?**
No

**Title of funding source**
Dr hani milani

**Proportion provided by this source**
100

**Public or private sector**
Private

**Domestic or foreign origin**
Domestic

**Category of foreign source of funding**
*empty*

**Country of origin**

**Type of organization providing the funding**
Persons

## Person responsible for general inquiries

**Contact**

**Name of organization / entity**
Karaj University of Medical Sciences

**Full name of responsible person**
Kobra Hosseini

**Position**
Medical Intern

**Latest degree**
Medical doctor

**Other areas of specialty/work**
Pediatrics

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## Person responsible for scientific inquiries

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## Person responsible for updating data

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**Latest degree**
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Pediatrics

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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