

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

28 Jun 2026

### The effect of Macitentan compared to Bosentan in neonates with persistent pulmonary hypertension treated with Sildenafil

#### Protocol summary

##### Study aim

Investigating the effect of Macitentan compared to Bosentan in infants with stable pulmonary hypertension treated with Sildenafil

##### Design

A clinical trial with parallel groups, double-blinded, randomized, phase 3 on 43 patients with persistent pulmonary hypertension of the newborn. The randomization function of Excel software was used for randomization.

##### Settings and conduct

This study was conducted in the NICU of Akbarabadi Hospital. Patients with persistent pulmonary hypertension of the newborn were randomly assigned to two groups. In intervention group A, neonates received Bosentan and Sildenafil. In group B, neonates received Macitentan and Sildenafil. In this study, the doctor and the researcher did not know about the type of medicine received.

##### Participants/Inclusion and exclusion criteria

Inclusion: 1. Newborns with respiratory symptoms, decreased arterial oxygen saturation and cyanosis  
Exclusion: 1. Cyanotic heart diseases 2. Increased pulmonary artery pressure due to pneumonia or meconium aspiration

##### Intervention groups

Group A: Bosentan tablets with a concentration of 1 mg/kg and Sildenafil with a concentration of 0.4 mg/kg every 12 hours by PG  
Group B: Macitentan tablets with a concentration of 1 mg/kg and Sildenafil with a concentration of 1 mg/kg every 12 hours by PG

##### Main outcome variables

Response to treatment of persistent pulmonary hypertension of the newborn

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20160120026115N9**

Registration date: **2022-12-03, 1401/09/12**

Registration timing: **retrospective**

Last update: **2022-12-03, 1401/09/12**

Update count: **0**

##### Registration date

2022-12-03, 1401/09/12

##### Registrant information

###### Name

Mandana Kashaki

###### Name of organization / entity

Iran University of Medical Sciences

###### Country

Iran (Islamic Republic of)

###### Phone

+98 21 5563 2277

###### Email address

kashakimd@gmail.com

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2020-12-30, 1399/10/10

##### Expected recruitment end date

2021-04-23, 1400/02/03

##### Actual recruitment start date

2021-08-01, 1400/05/10

##### Actual recruitment end date

2021-11-02, 1400/08/11

##### Trial completion date

2022-06-02, 1401/03/12

##### Scientific title

The effect of Macitentan compared to Bosentan in neonates with persistent pulmonary hypertension treated with Sildenafil

**Public title**

The effect of Macitentan compared to Bosentan in neonates with persistent pulmonary hypertension treated with Sildenafil

**Purpose**

Treatment

**Inclusion/Exclusion criteria****Inclusion criteria:**

Parents' satisfaction to participate in the study Newborns with respiratory symptoms, decreased arterial oxygen saturation, and cyanosis Pulmonary artery pressure greater than or equal to 25 mmHg and severity of tricuspid valve failure greater than or equal to 30 mmHg with or without right-to-left shunt

**Exclusion criteria:**

Cyanotic heart diseases Other diseases cyanosis Increased pulmonary artery pressure due to pneumonia or meconium aspiration

**Age**

From **1 day** old to **1 month** old

**Gender**

Both

**Phase**

3

**Groups that have been masked**

- Participant
- Care provider
- Investigator
- Outcome assessor
- Data analyser
- Data and Safety Monitoring Board

**Sample size**

Target sample size: **60**

Actual sample size reached: **60**

**Randomization (investigator's opinion)**

Randomized

**Randomization description**

Randomization was done according to the random number table using the RAND function in Excel software. The even numbers obtained in this table were assigned to drug A (Bosentan and Sildenafil) and the odd numbers to drug B (Masitentan and Sildenafil). The random list was given to the epidemiologist of the study, and each patient who entered the study was contacted by the doctor to find out whether the person entered group A or B.

**Blinding (investigator's opinion)**

Double blinded

**Blinding description**

The drugs received are identical in appearance (color and size), the pills were placed in coded envelopes with the same appearance, and the patient and cardiologist did not know about the drug received.

**Placebo**

Not used

**Assignment**

Parallel

**Other design features****Secondary Ids**

empty

**Ethics committees****1****Ethics committee****Name of ethics committee**

Ethics committee of Iran University of Medical Sciences

**Street address**

Next to the Milad Tower, Hemat Highway.

**City**

Tehran

**Province**

Tehran

**Postal code**

1449614535

**Approval date**

2021-06-12, 1400/03/22

**Ethics committee reference number**

IR.IUMS.FMD.REC.1400.168

**Health conditions studied****1****Description of health condition studied**

Persistent pulmonary hypertension of the newborn

**ICD-10 code**

P29.3

**ICD-10 code description**

Persistent fetal circulation

**Primary outcomes****1****Description**

Persistent Pulmonary Hypertension of the Newborn

**Timepoint**

The beginning of the study, 6 and 12 days after the intervention

**Method of measurement**

Echocardiography

**Secondary outcomes**

empty

**Intervention groups****1****Description**

Intervention group: Bosentan tablets (manufactured by Faran Shimi, Iran) with a concentration of 1 mg/kg and Sildenafil (Alborz Darou) with a concentration of 0.4 mg/kg every 12 hours were prescribed. The treatment was discontinued when the arterial oxygen saturation level

was higher than 95 and the Pulmonary Arterial Hypertension was lower than 25 in echocardiography and the severity of Tricuspid valve regurgitation was lower than 30.

**Category**

Treatment - Drugs

**2****Description**

Intervention group: Macitentan tablets (Tadbir Kalaye Jam) with a concentration of 1 mg/kg and Sildenafil(Alborz Darou) with a concentration of 1 mg/kg every twelve hours were prescribed. The treatment was discontinued when the arterial oxygen saturation level was higher than 95 and the Pulmonary Arterial Hypertension was lower than 25 in echocardiography and the severity of Tricuspid valve regurgitation was lower than 30.

**Category**

Treatment - Drugs

**Recruitment centers****1****Recruitment center****Name of recruitment center**

Shahid Akbarabadi Hospital

**Full name of responsible person**

Sama dabbagh

**Street address**

Molavi St, Molavi (cross)

**City**

Tehran

**Province**

Tehran

**Postal code**

1168743514

**Phone**

+98 917 411 8132

**Fax**

+98 21 5560 8012

**Email**

S.dabbagh69@yahoo.com

**Web page address****Sponsors / Funding sources****1****Sponsor****Name of organization / entity**

Iran University of Medical Sciences

**Full name of responsible person**

Hosein Keyvani

**Street address**

Next to the Milad tower, Shahid Hemmat Highway,  
Iran University of Medical Sciences

**City**

Tehran

**Province**

Tehran

**Postal code**

1449614535

**Phone**

+98 21 8670 2503

**Email**

keyvani.h@iums.ac.ir

**Grant name****Grant code / Reference number****Is the source of funding the same sponsor organization/entity?**

Yes

**Title of funding source**

Iran 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**

Iran University of Medical Sciences

**Full name of responsible person**

Sama dabbagh

**Position**

Resident

**Latest degree**

Specialist

**Other areas of specialty/work**

Pediatrics

**Street address**

Next to the Milad Tower, Hemat Highway.

**City**

Tehran

**Province**

Tehran

**Postal code**

1449614535

**Phone**

+98 21 8843 0783

**Email**

S.dabbagh69@yahoo.com

**Person responsible for scientific inquiries****Contact****Name of organization / entity**

Iran University of Medical Sciences

**Full name of responsible person**

Mandana Kashaki

**Position**

Associate professor

**Latest degree**  
Subspecialist  
**Other areas of specialty/work**  
Pediatrics  
**Street address**  
Molavi (cross), Molavi St  
**City**  
Tehran  
**Province**  
Tehran  
**Postal code**  
1168743514  
**Phone**  
+98 21 5560 6034  
**Email**  
kashakimd@gmail.com  
**Web page address**

## Person responsible for updating data

### Contact

**Name of organization / entity**  
Iran University of Medical Sciences  
**Full name of responsible person**  
Sama dabbagh  
**Position**  
Resident  
**Latest degree**  
Specialist  
**Other areas of specialty/work**  
Pediatrics  
**Street address**  
No193, Zafar St, Aliasghar Children's Hospital  
**City**  
Tehran  
**Province**  
Tehran  
**Postal code**

1919816766

**Phone**  
+98 21 8843 0783

**Email**  
S.dabbagh69@yahoo.com

## Sharing plan

### Deidentified Individual Participant Data Set (IPD)

Yes - There is a plan to make this available

### Study Protocol

Yes - There is a plan to make this available

### Statistical Analysis Plan

No - There is not a plan to make this available

### Informed Consent Form

Yes - There is a plan to make this available

### Clinical Study Report

Yes - There is a plan to make this available

### Analytic Code

No - There is not a plan to make this available

### Data Dictionary

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

### Title and more details about the data/document

Available Information

### When the data will become available and for how long

1402

### To whom data/document is available

All of people

### Under which criteria data/document could be used

Information

### From where data/document is obtainable

Email S.dabbagh69@yahoo.com

### What processes are involved for a request to access data/document

Asked from email

### Comments