

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

04 Aug 2026

### Evaluation of efficacy and safety of Zytux™ (Rituximab) in refractory myasthenia gravis patients

#### Protocol summary

##### Study aim

Evaluation of efficacy and safety of Zytux™ (Rituximab) in refractory myasthenia gravis patients

##### Design

This phase 4 prospective, single-arm, open-label, pre-post clinical trial study will be conducted in 30 patients with refractory myasthenia gravis.

##### Settings and conduct

This multi-center study will be conducted in patients with refractory myasthenia gravis in six different cities of Iran with a follow-up duration of 48 weeks. Zytux™ (Rituximab) will be administered to the eligible patients 2 times at day 0 and 15, followed by one single injection 6 months later. The outcomes will be assessed and recorded by a physician through 48 weeks of monitoring of the patients.

##### Participants/Inclusion and exclusion criteria

Inclusion criteria: Generalized Non-Thymomatous myasthenia gravis patients, Not having previous treatment with rituximab, Refractory to standard treatment or contraindicated including corticosteroid or Azathioprine, Age between 18 and 80 years Exclusion criteria: Pregnancy, Planning for pregnancy in the following year, Lactation, Active infection, HBsAg+ OR HBV DNA Positive, Prior malignancy, Hypersensitivity reactions or anaphylactic shock to rituximab, Major renal disease, Major Hepatic disease, Cardiac Arrhythmia history, Occular myasthenia gravis, Thymomatous myasthenia gravis, Major Psychiatric disease, Doing Thymectomy

##### Intervention groups

The therapeutic schema is rituximab 1000 mg, 2 times at day 0 and 15, followed by one single injection (1000 mg) 6 months later. However, rituximab infusion will be administered sooner if myasthenic symptoms reappear and interfere with daily life activities of patient (the interval between Rituximab infusions should be at least three months).

##### Main outcome variables

Changes in the mean dose of corticosteroid used by patients

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20150303021315N18**

Registration date: **2020-05-23, 1399/03/03**

Registration timing: **registered\_while\_recruiting**

Last update: **2020-05-23, 1399/03/03**

Update count: **0**

##### Registration date

2020-05-23, 1399/03/03

##### Registrant information

##### Name

Nassim Anjidan

##### Name of organization / entity

Orchid Pharmed

##### Country

Iran (Islamic Republic of)

##### Phone

+98 21 4347 3000

##### Email address

amini@orchidpharmed.com

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2020-02-11, 1398/11/22

##### Expected recruitment end date

2021-02-10, 1399/11/22

##### Actual recruitment start date

empty

##### Actual recruitment end date

empty

**Trial completion date**  
empty

**Scientific title**  
Evaluation of efficacy and safety of Zytux™ (Rituximab) in refractory myasthenia gravis patients

**Public title**  
Evaluation of efficacy and safety of Zytux™ (Rituximab) in refractory myasthenia gravis patients

**Purpose**  
Treatment

**Inclusion/Exclusion criteria**  
**Inclusion criteria:**  
 Generalized Non-Thymothamous patients with myasthenia gravis patients including MuSK Antibody positive, AChR Antibody positive, and Seronegative myasthenia gravis patients. Not having previous treatment with rituximab. Refractory to standard treatment or contraindicated including Corticosteroid dependency (taking at least 2 months of 1mg/kg corticosteroid medications and has not responded properly, or being stable with steroid therapy, but during tapering down the medication up to 30 mg alternative or 15 mg daily, has experienced a relapse of the disease); Having contraindication of corticosteroid therapy; Not responder to Azathioprine (2-3 mg/kg) therapy for at least 9 months of taking the medication or because of occurrence of adverse effects of Azathioprine the medication has been stopped. Aged greater or equal to 18, and lesser or equal to 80.  
**Exclusion criteria:**  
 Pregnancy Planning for pregnancy in the following year  
 Lactation Active infection HBsAg+ OR HBV DNA Positive  
 Prior malignancy Hypersensitivity reactions or anaphylactic shock to rituximab Major renal disease Major Hepatic disease Cardiac Arrhythmia history Occular myasthenia gravis Thymomathous myasthenia gravis Major Psychiatric disease Doing Thymectomy

**Age**  
From **18 years** old to **80 years** old

**Gender**  
Both

**Phase**  
4

**Groups that have been masked**  
No information

**Sample size**  
Target sample size: **30**

**Randomization (investigator's opinion)**  
N/A

**Randomization description**

**Blinding (investigator's opinion)**  
Not blinded

**Blinding description**

**Placebo**  
Not used

**Assignment**  
Single

**Other design features**

## Secondary Ids

empty

## Ethics committees

### 1

#### Ethics committee

##### Name of ethics committee

Ethics Committee of Tehran University of Medical Sciences

##### Street address

No. 23, 16th Azar Ave., Keshavarz Blvd.

##### City

Tehran

##### Province

Tehran

##### Postal code

1417863181

#### Approval date

2020-02-11, 1398/11/22

#### Ethics committee reference number

IR.TUMS.MEDICINE.REC.1398.879

## Health conditions studied

### 1

#### Description of health condition studied

Myasthenia gravis

#### ICD-10 code

G70

#### ICD-10 code description

Myasthenia gravis and other myoneural disorders

## Primary outcomes

### 1

#### Description

Changes in the mean dose of corticosteroid used by patients

#### Timepoint

day 0, day 15, week 12, week 24, week 36, week 48

#### Method of measurement

Patient's concomitant medication

## Secondary outcomes

### 1

#### Description

Safety of Zytux™ (Rituximab) in refractory myasthenia gravis patients

#### Timepoint

day 0, day 15, week 12, week 24, week 36, week 48

#### Method of measurement

Physical Examination

## 2

### **Description**

Time to relapse from the onset of treatment

### **Timepoint**

day 0, day 15, week 12, week 24, week 36, week 48

### **Method of measurement**

Physical Examination

## 3

### **Description**

Changes in AChR and MuSK antibody levels

### **Timepoint**

day 0 and week 48

### **Method of measurement**

The Serum titer of AChR and MuSK antibodies

## 4

### **Description**

Changes in the mean dose of pyridostigmine used by patients

### **Timepoint**

day 0, day 15, week 12, week 24, week 36, week 48

### **Method of measurement**

Patient's concomitant drugs during treatment

## 5

### **Description**

Changes in CD19 and CD20 levels

### **Timepoint**

week 7, week 24

### **Method of measurement**

Flow Cytometry

## **Intervention groups**

## 1

### **Description**

The therapeutic process consists of two cycles. In cycle 1, Zytux™ 1000 mg (Aryogen-Pharmed Rituximab concentrated solution of 10mg/ml made for infusion) will be administered 2 times at day 0 and 15 and one single infusion (1000 mg) 6 months later in cycle 2. However, Zytux™ will be administered sooner if myasthenic symptoms reappear and interfere with the daily life activities of the patient (the interval between Zytux™ infusions should be at least three months).

### **Category**

Treatment - Drugs

## **Recruitment centers**

## 1

### **Recruitment center**

#### **Name of recruitment center**

Shariati hospital

#### **Full name of responsible person**

Dr Farzad Fatehi

### **Street address**

Jalal Al Ahmad Highway, North Karegar Ave.

### **City**

Tehran

### **Province**

Tehran

### **Postal code**

1411713135

### **Phone**

+98 21 8490 1000

### **Email**

fatehifa@gmail.com

## 2

### **Recruitment center**

#### **Name of recruitment center**

Bahman hospital

#### **Full name of responsible person**

Dr Nima Mohsen zadeh Kermani

#### **Street address**

North Iranzamin Ave., Shahrak Gharb

#### **City**

Tehran

#### **Province**

Tehran

#### **Postal code**

1465795481

#### **Phone**

+98 21 8857 5901

#### **Email**

nimamk@yahoo.com

## 3

### **Recruitment center**

#### **Name of recruitment center**

Imam Khomeini hospital

#### **Full name of responsible person**

Dr Payam Sarraf

#### **Street address**

Keshavarz Blvd.

#### **City**

Tehran

#### **Province**

Tehran

#### **Postal code**

14197333141

#### **Phone**

+98 21 6694 8899

#### **Email**

sarrafp@gmail.com

## 4

### **Recruitment center**

#### **Name of recruitment center**

Sina hospital

#### **Full name of responsible person**

Dr Aliasghar Okhovat

#### **Street address**

Imam Khomeini Ave.

#### **City**

Tehran  
**Province**  
Tehran  
**Postal code**  
1136746911  
**Phone**  
+98 21 6634 8500  
**Email**  
aliokhi20@gmail.com

## 5

**Recruitment center**  
**Name of recruitment center**  
Imam Hossein hospital  
**Full name of responsible person**  
Dr Nahid Beladi Moqadam  
**Street address**  
Shahid Madani St.  
**City**  
Tehran  
**Province**  
Tehran  
**Postal code**  
1617763141  
**Phone**  
+98 21 7343 3000  
**Email**  
nbeladi@yahoo.com

## 6

**Recruitment center**  
**Name of recruitment center**  
Firoozgar hospital  
**Full name of responsible person**  
Bahram Haghi-Ashtiani  
**Street address**  
Valiasr Sq.  
**City**  
Tehran  
**Province**  
Tehran  
**Postal code**  
1593747811  
**Phone**  
+98 21 8214 1000  
**Email**  
bhaghi2000@yahoo.com

## 7

**Recruitment center**  
**Name of recruitment center**  
Alzahra hospital  
**Full name of responsible person**  
Dr Kayvan Basiri  
**Street address**  
Soffeh Blvd.  
**City**  
Esfahan  
**Province**  
Isfahan

**Postal code**  
8174675731  
**Phone**  
+98 31 3620 1818  
**Email**  
basirik@med.mui.ac.ir

## 8

**Recruitment center**  
**Name of recruitment center**  
Ayatollah Kashani hospital  
**Full name of responsible person**  
Dr Majid Ghasemi  
**Street address**  
Ayatollah Kashani Blvd.  
**City**  
Esfahan  
**Province**  
Isfahan  
**Postal code**  
8183983434  
**Phone**  
+98 31 3233 0091  
**Email**  
ghasemi@med.mui.ac.ir

## 9

**Recruitment center**  
**Name of recruitment center**  
Shafa hospital  
**Full name of responsible person**  
Dr Behnaz Sedighi  
**Street address**  
Kosar Blvd.  
**City**  
Kerman  
**Province**  
Kerman  
**Postal code**  
7618751151  
**Phone**  
+98 34 3211 5780  
**Email**  
behnaz.sedighi@gmail.com

## 10

**Recruitment center**  
**Name of recruitment center**  
Ghaem hospital  
**Full name of responsible person**  
Dr. Reza Bostani  
**Street address**  
Ghaem Hospital, Dr. Shariati St., Ahmad Abad, St.,  
Ghaem Hospital  
**City**  
Mashhad  
**Province**  
Razavi Khorasan  
**Postal code**  
9176699199

**Phone**  
+98 51 3840 0001  
**Email**  
rezabostani@yahoo.com

## 11

### Recruitment center

**Name of recruitment center**  
Namazi hospital  
**Full name of responsible person**  
Dr Abbas Rahimi Jaberi  
**Street address**  
Zand Street, Namaz Square, Shiraz, Fars, Iran  
**City**  
Shiraz  
**Province**  
Fars  
**Postal code**  
7193613311  
**Phone**  
+98 71 3647 4332  
**Email**  
rahimijaberia@gmail.com

## 12

### Recruitment center

**Name of recruitment center**  
Emam Reza hospital  
**Full name of responsible person**  
Dr Hormoz Ayromlouh; Dr Mohammad Yazdchi  
Marandi  
**Street address**  
Golgasht St.  
**City**  
Tabriz  
**Province**  
West Azarbaijan  
**Postal code**  
5166614756  
**Phone**  
+98 41 3335 2073  
**Email**  
ayromlouh@gmail.com

## Sponsors / Funding sources

### 1

#### Sponsor

**Name of organization / entity**  
AryoGen Pharmed Co.  
**Full name of responsible person**  
Nassim Anjidani  
**Street address**  
Cross Tajbakhsh Street, 24th Kilometer Makhsous.  
**City**  
Garm Darreh  
**Province**  
Alborz  
**Postal code**

56145226  
**Phone**  
+98 26 3610 6480  
**Email**  
contact@aryogen.com

#### Grant name

#### Grant code / Reference number

#### Is the source of funding the same sponsor organization/entity?

Yes

#### Title of funding source

AryoGen Pharmed Co.

#### 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

Industry

## Person responsible for general inquiries

### Contact

**Name of organization / entity**  
Orchid Pharmed Co.  
**Full name of responsible person**  
Nassim Anjidani  
**Position**  
Medical Department Manager  
**Latest degree**  
Medical doctor  
**Other areas of specialty/work**  
Medical Pharmacy  
**Street address**  
No 42, Attar St., Vanak Sq.  
**City**  
Tehran  
**Province**  
Tehran  
**Postal code**  
1994766411  
**Phone**  
009843473000  
**Email**  
anjidani.n@orchipharmed.com

## Person responsible for scientific inquiries

### Contact

**Name of organization / entity**  
Tehran University of Medical Sciences  
**Full name of responsible person**  
Dr. Farzad Fatehi  
**Position**  
Associate professor  
**Latest degree**  
Subspecialist

**Other areas of specialty/work**

Neurology

**Street address**

Shariati hospital, Cross Jalal Al Ahmad highway, North Karegar St.

**City**

Tehran

**Province**

Tehran

**Postal code**

1411713135

**Phone**

+98 21 8490 1000

**Email**

fatehifa@gmail.com

**Person responsible for updating data****Contact****Name of organization / entity**

Orchid Pharmed Co.

**Full name of responsible person**

Nassim Anjidani

**Position**

Medical Department Manager

**Latest degree**

Medical doctor

**Other areas of specialty/work**

Medical Pharmacy

**Street address**

No 42, Attar Neyshaboori St., Vanak Sq.

**City**

Tehran

**Province**

Tehran

**Postal code**

1994766411

**Phone**

+98 21 4347 3000

**Email**

anjidani.n@orchidpharmed.com

**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