Clinical Trial Protocol
Iranian Registry of Clinical Trials

08 Nov 2026

Evaluation of the Protective and Therapeutic Effects of Sildenafil Citrate Mouthwash on the Severity of Radiotherapy-Induced Oral Mucositis in Head and Neck Cancer Patients: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial

Protocol summary

Study aim

Therapeutic effect of sildenafil citrate mouthwash in reducing the severity of oral mucositis induced by radiotherapy in patients with head and neck malignancy

Design

This study is a controlled clinical trial. Randomization will be performed based on the block randomization method. The expected sample size will be divided into two parallel control groups and the main drug user group (intervention group).

Settings and conduct

Seyed Al-Shohada Hospital - Clinical Trial

Participants/Inclusion and exclusion criteria

Inclusion criteria: 1) Adult patients (18 years and older) 2) Stage 1-4 squamous cell carcinoma, nasopharyngeal carcinoma 3) Patients receiving a total dose of 60 Gy or more in 30 fractions with or without cisplatin 4) Having a maximum performance score of 0 to 2 based on the ECOG Performance Status classification. 5) No history of oral and salivary gland diseases before starting radiotherapy. 6) No history of liver and kidney failure 7) Adequate bone marrow function Exclusion criteria: 1) Known allergic reaction to sildenafil or any component of the mouthwash formulation 3) Concomitant use of strong CYP3A4 inhibitors or moderate inhibitors of any drug that has the risk of increasing plasma concentrations of sildenafil 4) Active oral infection or other inflammatory or ulcerative diseases of the oral mucosa unrelated to radiation therapy 4) Systolic blood pressure less than 90 mm Hg 5) Patients taking blood pressure-lowering drugs or drugs related to cardiovascular diseases such as nitrates 6) Pregnancy or breastfeeding.

Intervention groups

In the intervention group, patients receive sildenafil mouthwash three times a day for 40 days from the start of radiotherapy. Also, in the parallel placebo group, patients use placebo mouthwash three times a day, and both groups are monitored.

Main outcome variables

Composition severity, dry mouth, pain level, quality of life

General information

Reason for update

Acronym

IRCT registration information

IRCT registration number: **IRCT20180722040556N12**
Registration date: **2026-06-03, 1405/03/13**
Registration timing: **prospective**

Last update: **2026-06-03, 1405/03/13**
Update count: **0**

Registration date

2026-06-03, 1405/03/13

Registrant information

Name

Azadeh Moghaddas

Name of organization / entity

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Iran (Islamic Republic of)

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Recruitment status

recruiting

Funding source

Expected recruitment start date

2026-06-22, 1405/04/01

Expected recruitment end date
2027-06-21, 1406/03/31
Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title
Evaluation of the Protective and Therapeutic Effects of Sildenafil Citrate Mouthwash on the Severity of Radiotherapy-Induced Oral Mucositis in Head and Neck Cancer Patients: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial

Public title
The effect of sildenafil mouthwash on radiotherapy-induced mucositis
Purpose
Treatment
Inclusion/Exclusion criteria
Inclusion criteria:
Adult patients (18 years and older) Stage 1-4 squamous cell carcinoma, nasopharyngeal carcinoma Patients receiving a total dose of 60 Gy or more in 30 fractions with or without cisplatin Having a maximum performance score of 0 to 2 based on the ECOG Performance Status classification. Patient expected to survive for at least three months. No history of oral and salivary gland diseases before starting radiotherapy. No history of liver and kidney failure Adequate bone marrow function (WBC count above 3000 cells per cubic millimeter of blood)
Exclusion criteria:
Known hypersensitivity or allergic reaction to sildenafil or any component of the mouthwash formulation Patients taking nitrates (nitroglycerin or isosorbide or similar nitrates) for angina or other heart problems (due to class X drug interactions with sildenafil). Concomitant use of strong CYP3A4 enzyme inhibitors (such as ketoconazole, itraconazole, ritonavir, and clarithromycin, erythromycin) or moderate inhibitors such as the calcium channel blocker family: diltiazem, verapamil, or the antifungal fluconazole, or any drug that has the risk of increasing the plasma concentration of sildenafil (before entering the study, the patient's medication list will be reviewed for clinically important drug interactions. Presence of active oral infection or other inflammatory or ulcerative diseases of the oral mucosa unrelated to radiation therapy (such as aphthous stomatitis and candidiasis). Patients who had a systolic blood pressure of less than 90 mmHg at the initial screening stage or whose blood pressure was identified as less than 90 mmHg during the study were included in the study. Patients taking blood pressure-lowering medications such as beta-blockers or calcium channel blockers, or medications related to cardiovascular disease such as digoxin or amiodarone Patients taking blood pressure-lowering medications such as beta-blockers or calcium channel blockers, or medications related to cardiovascular disease such as digoxin or amiodarone
Age
From **18 years** old

Gender
Both

Phase
3
Groups that have been masked

- Participant
- Care provider
- Investigator
- Data analyser

Sample size
Target sample size: **36**
Randomization (investigator's opinion)
Randomized
Randomization description
Randomization will be done based on block randomization method. The sampling method is to enter information such as the number of treatment groups, block size (multiple of the number of groups) and the total number of patients in the Internet software for this calculation, and according to the codes that are analyzed The final result is determined, the type of medication received by each patient is determined. In this study, considering that the number of treatment groups was 2 groups, 8 blocks (multiples of 2) are used. The predicted sample size of patients using this sampling method is completely randomly divided into two groups: control users and the main drug user.
Blinding (investigator's opinion)
Double blinded
Blinding description
After preparing the most suitable formulation prepared by a pharmacy student under the supervision of a colleague from the Pharmaceutics group, a placebo similar to the main mouthwash (water solvent with preservative and flavoring) is also prepared and given to the main researcher. The amount of volume predicted for the patient's need for one week (60 ml daily) in glass packages with a code determining the placebo or drug of the product that only the main researcher knows about, will be given to the pharmacy student who collects the information and finally to the patient.
Placebo
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

Isfahan University of medical Scienices, hezar jarib street, Isfahan, Iran

City
isfahan

Province
Isfehan

Postal code
8174673461

Approval date
2026-05-12, 1405/02/22

Ethics committee reference number
IR.MUI.PHANUT.REC.1405.028

Health conditions studied

1

Description of health condition studied
Head and Neck Cancer

ICD-10 code
C00-C14

ICD-10 code description
Malignant neoplasm of external lip, unspecified and oral cavity

Primary outcomes

1

Description
Severity of oral mucositis caused by radiation therapy

Timepoint
before intervention and then daily until day 7, then twice a week until day 21 after intervention

Method of measurement
NCI -CTCAE version 4.0 Score

2

Description
Pain intensity due to radiation-induced mucositis

Timepoint
before intervention and then daily until day 7, then twice a week until day 21 after intervention

Method of measurement
Number pain rating scale

3

Description
The extent of mouth dryness caused by radiation therapy

Timepoint
before intervention and then daily until day 7, then twice a week until day 21 after intervention

Method of measurement
mouth dryness questionnaire (VAS)

4

Description
Quality of life

Timepoint
before intervention and then daily until day 7, then twice a week until day 21 after intervention

Method of measurement
modified Oral Mucositis Daily Questionnaire (modified OMDQ)

Secondary outcomes

1

Description
Side effects of mouthwash

Timepoint
before intervention and then daily until day 7, then twice a week until day 21 after intervention

Method of measurement
PRO-NCI-CTCAE Scale

Intervention groups

1

Description
Intervention group: Patients with head and neck cancer gargle 20 ml of sildenafil mouthwash three times a day from the first session of radiotherapy and continue to use the mouthwash for the entire course of radiotherapy, which is about 40 days. Some patients develop mouth ulcers (stomata) during radiotherapy sessions, which can be used as part of routine treatments to use the studied mouthwash.

Category
Treatment - Drugs

2

Description
Control group: Control group: They will use a placebo mouthwash completely similar to the sildenafil mouthwash prepared at the Faculty of Pharmacy, gargling 20 ml three times a day and continue using the mouthwash for the entire duration of the radiotherapy treatment, which is about 40 days. If patients develop mouth ulcers (stomatitis) during the radiotherapy sessions, patients will be allowed to use routine treatments (cocktail containing diphenhydramine syrup, aluminum hydroxide, and nystatin drops and chlorhexidine mouthwash) three times a day, 20 ml each time, in addition to taking the placebo.

Category
Placebo

Recruitment centers

1

Recruitment center

Name of recruitment center
Seyed al-Shohada Teaching hospital

Full name of responsible person
Azadeh Moghaddas

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Sponsors / Funding sources

1

Sponsor
Name of organization / entity
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moghaddas@pharm.mui.ac.ir
Grant name
Grant code / Reference number
Is the source of funding the same sponsor organization/entity?
No
Title of funding source
En Vice-Chancellery for Research of Isfahan 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
Azadeh Moghaddas
Position
Assistant Professor of Clinical Pharmacy
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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
Yes - There is 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
Yes - There is a plan to make this available
Data Dictionary
Yes - There is a plan to make this available
Title and more details about the data/document
All collected data
When the data will become available and for how long
6 month after results are published
To whom data/document is available
All academic centers
Under which criteria data/document could be used
All documents with citation
From where data/document is obtainable
E-mail address
What processes are involved for a request to access data/document
After sending a request, we will call the related person and the data will be revealed in less than one week.
Comments