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# A study to assess the amount of sildenafil that reaches the blood circulation after administration of an oral film dissolvable in the mouth for treating erectile dysfunction in comparison to the marketed tablet Viagra®, both taken by healthy men under fed conditions

**Submission date**
19/12/2022

**Recruitment status**
No longer recruiting

**Registration date**
10/01/2023

**Overall study status**
Completed

**Last Edited**
29/03/2023

**Condition category**
Mental and Behavioural Disorders

[ ] Prospectively registered
[X] Protocol
[ ] Statistical analysis plan
[X] Results
[ ] Individual participant data

## Plain English summary of protocol

Background and study aims
A new oral film containing sildenafil citrate, the active ingredient of Viagra used to treat erectile dysfunction, has been recently developed. It dissolves very rapidly in the oral mouth, with no need for drinking or chewing, thus providing an alternative to the marketed solid oral forms (tablets) in the treatment of erectile dysfunction. This study is designed to investigate the amount of the drug that reaches the blood flow after administration of the new sildenafil oral film with and without water in comparison to the marketed tablet Viagra®.

Who can participate?
Healthy men aged 18-55 years can participate. They must comprehend the full nature and purpose of the study, including possible risks and side effects, and co-operate with the investigator to comply with the requirements of the entire study.

What does the study involve?
The study will be conducted at CROSS Research S.A. Phase I Unit Clinical Center, in Arzo, Switzerland. Study participants will receive a single oral dose of Sildenafil IBSA 100 mg oral film without water, a single oral dose of Sildenafil IBSA 100 mg oral film with water and a single oral dose of Viagra® 100 mg film-coated tablet in 3 study periods, under fed conditions, with a wash-out interval of at least 5 days between the 3 administrations. Participants will have blood samples taken and vital parameters recorded at regular intervals.

What are the possible benefits and risks of participating?
Participating in this study will not bring any direct benefit to participants, with the exception of the medical tests that will be performed during it. On the basis of sildenafil safety profile, no

particular risks are expected. However, as with all products, the appearance of allergic reactions or side effects that are known or not yet known cannot be ruled out.

Where is the study run from?
The study will be conducted at the CROSS Research S.A. Phase I Unit Clinical Center, in Arzo, Switzerland.

When is the study starting and how long is it expected to run for?
July 2020 to January 2021

Who is funding the study?
IBSA Institut Biochimique S.A. (Switzerland)

Who is the main contact?
Dr Milko Radicioni, clinic@croalliance.com

# Contact information

### Type(s)
Scientific

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# Additional identifiers

### EudraCT/CTIS number
Nil known

### IRAS number

### ClinicalTrials.gov number
Nil known

### Secondary identifying numbers
20CH-SDF10

# Study information

## Scientific Title
Comparative bioavailability study of Sildenafil 100 mg oral film vs. Viagra® 100 mg film-coated tablet administered to healthy men under fed conditions

## Study objectives
To compare the bioavailability of sildenafil and its metabolite N-desmethyl-sildenafil after single dose administration of Sildenafil IBSA 100 mg oral film and Viagra® 100 mg film-coated tablet to healthy male volunteers under fed conditions.

## Ethics approval required
Old ethics approval format

## Ethics approval(s)
Approved 14/07/2020, Canton Ticino Ethics committee (c/o Ufficio di sanità, Via Orico 5, 6501 Bellinzona, Switzerland; +41(0)91.814.30.57; beatrice.giberti-gai@ti.ch), ref: 2020-01698 / CE-3698

## Study design
Single center single dose randomized open-label 3-way cross-over fed conditions bioavailability study

## Primary study design
Interventional

## Secondary study design
Randomised cross over trial

## Study setting(s)
Other

## Study type(s)
Other

## Participant information sheet
Not available in web format, please use contact details to request a participant information sheet

## Health condition(s) or problem(s) studied
Sildenafil for erectile dysfunction

## Interventions
A single dose of the investigational medicinal product (Sildenafil IBSA 100 mg oral film) without water, a single dose of the investigational medicinal product with water and a single dose of Viagra® 100 mg film-coated tablet will be administered to the study subjects in three study periods, according to a 3-way cross-over randomised design, under fed conditions, with a wash-out interval of at least 5 days between the three administrations.

The investigational medicinal products will be orally administered on day 1 of each study period at 08:00±1 h as follows:
- one Sildenafil IBSA 100 mg oral film will be administered to the subjects without water. For the administration, the Investigator or his deputy will take the film out of the sachet and place it

directly on the subject's tongue. The Investigator will wear gloves during the administration procedure. The film will dissolve rapidly. Subjects will let the oral film completely dissolve in their mouth. The film must NOT be swallowed whole and must NOT be chewed or broken. The subject will be allowed to swallow saliva as the film dissolves in the mouth. When the subject indicates complete disintegration of the oral film, a visual inspection will be performed. In details, once the subject feels that the film has completely dissolved, he will inform the Investigator who will inspect the subject’s mouth and verify the complete dissolution in the mouth. If the subject does not inform the investigator within one min of the administration, his mouth will be checked by the Investigator. Film dissolution times will be collected in the specific source documents and subjects’ CRFs.
- one Sildenafil IBSA 100 mg oral film will be administered to the subjects with water. For the administration, the procedure previously described for the administration without water will be followed. After complete film dissolution, the subjects will drink 240 mL of still mineral water.
- one Viagra® 100 mg film-coated tablet will be administered to the subjects together with 240 mL of still mineral water. The tablet must be swallowed whole and must not be chewed or broken.
The volunteers will receive the three investigational treatments in the three study periods under fed conditions, i.e. 30 min after starting a high-fat and high-caloric breakfast.

## Intervention Type
Drug

## Phase
Phase I

## Drug/device/biological/vaccine name(s)
Sildenafil

## Primary outcome measure
Rate (Cmax) and extent (AUC0-t and AUC0-inf, if feasible) of sildenafil absorption in plasma measured from plasma samples taken at pre-dose (0) and 6, 15, 30, 45 min and 1, 1.25, 1.5, 2, 2.5, 3, 4, 6, 8, 12, 16 and 24 h post-dose.

## Secondary outcome measures
1. Time to peak (tmax), relative bioavailability (Frel) and, if feasible, elimination half-life (t1/2) and terminal elimination rate constant (λz) of plasma sildenafil measured from plasma samples taken at pre-dose (0) and 6, 15, 30, 45 min and 1, 1.25, 1.5, 2, 2.5, 3, 4, 6, 8, 12, 16 and 24 h post-dose
2. Rate (Cmax) and extent (AUC0-t and AUC0-inf if feasible) of absorption, time to peak (tmax), relative bioavailability (Frel) and, if feasible, elimination half-life (t1/2) and terminal elimination rate constant (λz) of plasma N-desmethyl-sildenafil measured from plasma samples taken at pre-dose (0) and 6, 15, 30, 45 min and 1, 1.25, 1.5, 2, 2.5, 3, 4, 6, 8, 12, 16 and 24 h post-dose
3. All adverse events occurring or worsening after the informed consent signature before (PTAEs) and after (TEAEs) the first dose of investigational medicinal product, vital signs (blood pressure and heart rate, measured at screening visit, in each study period at pre-dose (0), 1.5 and 24 h post-dose, at early termination visit [ETV] if applicable), body weight (measured at screening and final visit/ETV as applicable), physical examinations (performed at screening and final visit/ETV as applicable), clinical laboratory parameters (haematology, blood chemistry and urine analysis performed at screening and final visit/ETV as applicable; virology performed at

screening visit; urine drug test performed at screening and at the entrance of each study period), ECG (performed at screening, in each study period at 24 h post-dose, at ETV, if applicable).

### Overall study start date
14/07/2020

### Completion date
28/01/2021

## Eligibility

### Key inclusion criteria
1. Informed consent: signed written informed consent before inclusion in the study
2. Sex and Age: males, 18-55 years old inclusive
3. Body Mass Index: 18.5-30 kg/m² inclusive
4. Vital signs: systolic blood pressure 100-139 mmHg, diastolic blood pressure 50-89 mmHg, heart rate 50-90 bpm, measured after 5 min at rest in the sitting position
5. Full comprehension: ability to comprehend the full nature and purpose of the study, including possible risks and side effects; ability to co-operate with the Investigator and to comply with the requirements of the entire study.

### Participant type(s)
Healthy volunteer

### Age group
Adult

### Lower age limit
18 Years

### Upper age limit
55 Years

### Sex
Male

### Target number of participants
36

### Total final enrolment
35

### Key exclusion criteria
1. Electrocardiogram (12-lead ECG in supine position): clinically significant abnormalities; out of range intervals (PR <110 msec, PR >200 msec, QRS <60 msec, QRS >110 msec and QTc > 440 msec)
2. Physical findings: clinically significant abnormal physical findings which could interfere with the objectives of the study; presence or history (within 28 days) of any tongue piercings; presence of any partials, braces or dentures

3. Laboratory analyses: clinically significant abnormal laboratory values indicative of physical illness
4. Allergy: ascertained or presumptive hypersensitivity to the active principle and/or formulations' ingredients; history of anaphylaxis to drugs or allergic reactions in general, which the Investigator considers may affect the outcome of the study
5. Diseases: significant history of renal, hepatic, gastrointestinal, cardiovascular, respiratory, skin, haematological, endocrine or neurological diseases that may interfere with the aim of the study; history of vision or hearing problems related to drugs of the PDE5 inhibitor pharmacological class; history of priapism; anatomical deformation of the penis (such as angulation, cavernosal fibrosis or Peyronie’s disease); history of ophthalmologic diseases like non-arteritic anterior ischemic optic neuropathy or retinitis pigmentosa
6. Medications: medications, including over the counter (OTC) medications and herbal remedies for 2 weeks before the start of the study. Organic nitrates will not be allowed for 28 days before screening
7. Investigative drug studies: participation in the evaluation of any investigational product for 3 months before this study. The 3-month interval is calculated as the time between the first calendar day of the month that follows the last visit of the previous study and the first day of the present study
8. Blood donation: blood donations for 3 months before this study
9. Drug, alcohol, caffeine, tobacco: history of drug, alcohol [>2 drinks/day, defined according to the USDA Dietary Guidelines 2015-2020], caffeine (>5 cups coffee/tea/day) or tobacco abuse (10 cigarettes/day)
10. Drug test: positive result at the drug test at screening or day-1
11. Alcohol test: positive alcohol breath test at day -1
12. Diet: abnormal diets (<1600 or >3500 kcal/day) or substantial changes in eating habits in the 4 weeks before this study; vegetarians.

### Date of first enrolment
01/12/2020

### Date of final enrolment
09/12/2020

## Locations

### Countries of recruitment
Switzerland

### Study participating centre
**CROSS Research S.A.**
Via F.A. Giorgioli 14
Arzo
Switzerland
6864

## Sponsor information

### Organisation
IBSA Institut Biochimique (Switzerland)

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### Sponsor type
Industry

### Website
https://www.ibsagroup.com/

### ROR
https://ror.org/051tj3a26

## Funder(s)

### Funder type
Not defined

### Funder Name
IBSA Institut Biochimique S.A.

## Results and Publications

### Publication and dissemination plan
To date, there are no plans to publish the study results on scientific journals.

### Intention to publish date
31/12/2023

### Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be stored in a non-publicly available repository: the IBSA Institut Biochimique S.A. repository.

### IPD sharing plan summary
Stored in non-publicly available repository

### Study outputs

| Output type | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|---|---|---|---|---|
| Protocol file | version 3.0 | 10/05/2021 | 22/12/2022 | No | No |
| Basic results | | 27/03/2023 | 27/03/2023 | No | No |