Respiratory effects of tapentadol and oxycodone assessed by pharmacokinetic-pharmacodynamic and response surface modeling in healthy volunteers

Published: 09-10-2018
Last updated: 12-04-2024

To construct the utility surfaces of tapentadol and oxycodone.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON48377

Source
ToetsingOnline

Brief title
SURF study

Condition

- Other condition

Synonym
pain

Health condition

pijn

Research involving
Human

Sponsors and support

Primary sponsor: Leids Universitair Medisch Centrum
Source(s) of monetary or material Support: Ministerie van OC&W,Grunenthal

Intervention

Keyword: breathing, opioid, respiration

Outcome measures

Primary outcome

(1) Changes in breath-to-breath minute ventilation as measured at

iso-hypercapnia; (2) Pain relief as measured by application of noxious stimuli

to the skin.

Secondary outcome

NA

Study description

Background summary

Opioids are potent pain killers and are used in soaring numbers to treat acute and chronic pain. Opioids, however, come with several side effects that vary in their severity and range from nausea/vomiting to life-threatening respiratory depression. Opioids differ in the characteristics with respect to wanted effect (analgesia) and side effects (eg. respiratory depression). These effects are best viewed concomitantly allowing comparison between opioid. One way of describing these effects simultaneously is by construction of safety or utility function (UF). These functions are based on the economy principle that all actions have benefit and harm (UF = benefit * harm). We further developed these functions in previous studies and now calculate a safety continuum or response surface that allows assessment of P(benefit AND harm), and P(benefit AND NOT harm), where P = probability. In this study we will determine the UF of two commonly used opioids, tapentadol and oxycodone.

Study objective

To construct the utility surfaces of tapentadol and oxycodone.

Study design

An open-label 2 phase cross-over pharmacokinetic-pharmacodynamic modeling study in healthy volunteers

Intervention

In phase 1, subjects will receive oral oxycodone (immediate release) on two separate occasions, once for assessment of the respiratory effects and once for assessment of the anti-nociceptive effects. In phase 2, subjects will receive oral tapentadol (immediate release) on two separate occasions, once for assessment of the respiratory effects and once for assessment of the anti-nociceptive effects.

Study burden and risks

(1) The risks of the study are minor. Nausea is the main side effect expected in this study that will be adequately treated with antiemetic medication. Additionally, respiratory depression occurs under controlled conditions. (2) The benefits of the study are considerable and related to the knowledge gained with respect to the amount of respiratory depression that is obtained at calibrated antinociception. The benefit relates to all individuals that at one point will be treated with these potent painkillers.

Contacts

Public
Leids Universitair Medisch Centrum

Albinusdreef 2
Leiden 2333 ZA
NL
Scientific
Leids Universitair Medisch Centrum

Albinusdreef 2
Leiden 2333 ZA
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Healthy volunteers of either sex aged 18-38 years

Exclusion criteria

- Presence of health issues including presence or history of any psychiatric, medical or neurologic disorder that may interfere with the current study (eg. neuropathic pain conditions);
- Presence or a history of illicit drug use or excessive alcohol consumption (>21 units per week),
- Known allergies to study medication.
- A positive drug screen on the day of screening or on any of the study days,
- Participation in another trial in the 3 months before enrolment,
- Use of medication on a regular basis (e.g. pain medication),
- Inability to fast for at least 8 hours prior to study treatment administration,
- Pregnancy or lactation,
- Inability to communicate with the research team
- elective surgery during the study period.

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Masking:	Open (masking not used)

Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	31-12-2018
Enrollment:	24
Type:	Actual

Medical products/devices used

Product type:	Medicine
Brand name:	oxycodon
Generic name:	oxycodon
Registration:	Yes - NL intended use
Product type:	Medicine
Brand name:	tapentadol
Generic name:	tapentadol
Registration:	Yes - NL intended use

Ethics review

Approved WMO

Date:	09-10-2018
Application type:	First submission
Review commission:	METC Leiden-Den Haag-Delft (Leiden)
	metc-ldd@lumc.nl

Approved WMO

Date:	29-11-2018
Application type:	First submission
Review commission:	METC Leiden-Den Haag-Delft (Leiden)
	metc-ldd@lumc.nl

Approved WMO

Date:	21-08-2019
Application type:	Amendment
Review commission:	METC Leiden-Den Haag-Delft (Leiden) metc-ldd@lumc.nl

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
EudraCT	EUCTR2018-003515-22-NL
CCMO	NL67486.058.18

Study results

Date completed:	16-10-2020
Actual enrolment:	24