



## Clinical trial results:

**Prospective randomized, double-blind, and placebo-controlled clinical trial with hydroxychloroquine (HCQ) in patients with erosive-inflammatory osteoarthritis (OA) of the finger joints (acronym: OA TREAT)**

### Summary

EudraCT number	2011-001689-16
Trial protocol	DE
Global end of trial date	05 July 2018

### Results information

Result version number	v1 (current)
This version publication date	21 March 2022
First version publication date	21 March 2022

### Trial information

#### Trial identification

Sponsor protocol code	20110531
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#### Additional study identifiers

ISRCTN number	ISRCTN46445413
ClinicalTrials.gov id (NCT number)	-
WHO universal trial number (UTN)	U1111-1121-1623
Other trial identifiers	German Register of Clinical Trials: DRKS00000796

Notes:

### Sponsors

Sponsor organisation name	Charité - Universitätsmedizin Berlin
Sponsor organisation address	Charitéplatz 1, Berlin, Germany, 10117
Public contact	Dep. of Rheumatology, CC12, Charité - Universitätsmedizin Berlin, +49 30450513133, insider@charite.de
Scientific contact	Dep. of Rheumatology, CC12, Charité - Universitätsmedizin Berlin, +49 30450513133, insider@charite.de

Notes:

### Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	No
Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial?	No
Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial?	No

Notes:

## Results analysis stage

Analysis stage	Final
Date of interim/final analysis	05 July 2018
Is this the analysis of the primary completion data?	Yes
Primary completion date	05 July 2018
Global end of trial reached?	Yes
Global end of trial date	05 July 2018
Was the trial ended prematurely?	No

Notes:

## General information about the trial

Main objective of the trial:

The aim of this study is to investigate efficacy and safety of HCQ by clinical and radiological outcome compared to placebo in patients with severe and refractory inflammatory hand OA.

Protection of trial subjects:

Half-yearly visits to the ophthalmologist. Regular monitoring of liver and kidney values and blood count. Patients receive an NSAID/Cox-2 inhibitor in addition to the verum/placebo.

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	01 October 2013
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	Yes

Notes:

## Population of trial subjects

### Subjects enrolled per country

Country: Number of subjects enrolled	Germany: 153
Worldwide total number of subjects	153
EEA total number of subjects	153

Notes:

### Subjects enrolled per age group

In utero	0
Preterm newborn - gestational age < 37 wk	0
Newborns (0-27 days)	0
Infants and toddlers (28 days-23 months)	0
Children (2-11 years)	0
Adolescents (12-17 years)	0
Adults (18-64 years)	153
From 65 to 84 years	0
85 years and over	0

## Subject disposition

### Recruitment

Recruitment details:

The subjects were recruited between 21.November 2013 to February 2017 in 47 study centres.

### Pre-assignment

Screening details:

A total number of 220 subjects with clinical symptoms of inflammatory hand OA according the American College of Rheumatology classification and with hand radiographs showing radiological signs of digital erosive OA defined by grades 2 or higher, per Kellgren and Lawrence Scale.

### Period 1

Period 1 title	Overall Trial (overall period)
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Double blind
Roles blinded	Subject, Investigator, Monitor, Data analyst

### Arms

Are arms mutually exclusive?	Yes
<b>Arm title</b>	Verum HCQ

Arm description:

Subjects received HCQ from day 1 up to week 52

Arm type	Experimental
Investigational medicinal product name	Hydroxychloroquine
Investigational medicinal product code	6584604.00.00
Other name	Quensyl, Hydroxychloroquine sulfate
Pharmaceutical forms	Capsule, hard
Routes of administration	Oral use

Dosage and administration details:

Hydroxychloroquine sulfate 200mg/capsule, dose 200mg resp. 400 mg HCQ depending on weight of subjects

30 - 49 kg one capsule every day

50 - 64 kg one capsule day one, two capsules every other day

> 64 kg two capsules every day

<b>Arm title</b>	Placebo
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Arm description:

Subjects were treated with placebo

Arm type	Placebo
Investigational medicinal product name	Placebo
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Capsule, hard
Routes of administration	Oral use

Dosage and administration details:

Subjects received placebo identical with study drug apart from the active ingredient, depending on weight of subjects

30 - 49 kg one capsule every day

50 - 64 kg one capsule day one, two capsules every other day

> 64 kg two capsules every day

<b>Number of subjects in period 1</b>	Verum HCQ	Placebo
Started	75	78
Completed	52	61
Not completed	23	17
Adverse event, serious fatal	7	-
Consent withdrawn by subject	7	4
Physician decision	3	1
Adverse event, non-fatal	3	12
Premature unblinding	1	-
Lost to follow-up	2	-

## Baseline characteristics

### Reporting groups

Reporting group title	Verum HCQ
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Reporting group description:

Subjects received HCQ from day 1 up to week 52

Reporting group title	Placebo
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Reporting group description:

Subjects were treated with placebo

Reporting group values	Verum HCQ	Placebo	Total
Number of subjects	75	78	153
Age categorical			
Units: Subjects			
In utero	0	0	0
Preterm newborn infants (gestational age < 37 wks)	0	0	0
Newborns (0-27 days)	0	0	0
Infants and toddlers (28 days-23 months)	0	0	0
Children (2-11 years)	0	0	0
Adolescents (12-17 years)	0	0	0
Adults (18-64 years)	75	78	153
From 65-84 years	0	0	0
85 years and over	0	0	0
Gender categorical			
Units: Subjects			
Female	68	60	128
Male	7	18	25

## End points

### End points reporting groups

Reporting group title	Verum HCQ
Reporting group description:	
Subjects received HCQ from day 1 up to week 52	
Reporting group title	Placebo
Reporting group description:	
Subjects were treated with placebo	

### Primary: Changes of AUSCAN Index for pain and hand disability from baseline to end of treatment (week 52)

End point title	Changes of AUSCAN Index for pain and hand disability from baseline to end of treatment (week 52)
End point description:	
End point type	Primary
End point timeframe:	
from baseline to week 52	

End point values	Verum HCQ	Placebo		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	75	78		
Units: score				
arithmetic mean (full range (min-max))				
AUSCAN pain	26.65 (23.91 to 29.38)	26.47 (23.88 to 29.06)		
AUSCAN function	48.1 (43.03 to 53.18)	51.3 (46.58 to 56.01)		

### Statistical analyses

Statistical analysis title	ANCOVA analyses
Statistical analysis description:	
the multiple endpoint test according to L��uter and O'Brien was applied to the 52 week outcome in the AUSCAN pain and hand function scales. To increase the accuracy, the L��uter SSsum test was applied to the baselineadjusted week 52 values of the two AUSCAN scales. The SS test is a onesided test. In the second step, a separate analysis of the AUSCAN pain and hand function scales was performed. These analyses were performed by an analysis of covariance (ANCOVA) with the corresponding AUSCAN	
Comparison groups	Verum HCQ v Placebo

Number of subjects included in analysis	153
Analysis specification	Post-hoc
Analysis type	superiority
P-value	< 0.05
Method	ANCOVA

### Secondary: change efficacy in measure HCQ between baseline and week 26

End point title	change efficacy in measure HCQ between baseline and week 26
End point description: Efficacy of HCQ determined by AUSCAN score, patient's global assessment of disease activity, patient's assessment of stiffness and physician's global assessment of disease activity from baseline to week 26	
End point type	Secondary
End point timeframe: from baseline to week 26	

End point values	Verum HCQ	Placebo		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	75	78		
Units: score				
arithmetic mean (full range (min-max))				
AUSCAN pain	26.66 (24.36 to 28.95)	25.94 (23.77 to 28.12)		
AUSCAN function	51.07 (47.04 to 55.11)	51.35 (47.77 to 54.94)		
AUSCAN stiffness	4.82 (4.3 to 5.35)	5.06 (4.55 to 5.57)		
Physican global	3.35 (2.96 to 3.74)	3.88 (3.54 to 4.23)		
Patient global	4.87 (4.33 to 5.4)	5.34 (4.8 to 5.88)		

### Statistical analyses

No statistical analyses for this end point

### Secondary: Radiographic progression from baseline to week 52

End point title	Radiographic progression from baseline to week 52
End point description: for p-value HCQ vs. placebo see attachment table 8	
End point type	Secondary
End point timeframe: from baseline to week 52	

End point values	Verum HCQ	Placebo		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	75	78		
Units: score				
arithmetic mean (full range (min-max))				
Kallmann score (modified)	53.59 (52.11 to 55.07)	52.8 (51.42 to 54.19)		
Erosion score (modified)	12.34 (11.65 to 13.04)	11.45 (10.79 to 12.1)		
Osteophytes	14.69 (14.31 to 15.06)	14.74 (14.39 to 15.1)		
Joint space narrowing	17.87 (17.42 to 18.32)	17.92 (17.5 to 18.34)		
Lateral deformity	2.57 (2.41 to 2.73)	2.57 (2.42 to 2.72)		
Subchondral cysts	3.67 (3.32 to 4.01)	3.84 (3.52 to 4.16)		
Sclerosis	2.41 (2.14 to 2.68)	2.32 (2.07 to 2.57)		

## Statistical analyses

No statistical analyses for this end point

## Secondary: change quality of life in measure HCQ vs. placebo from baseline to week 26 and week 52

End point title	change quality of life in measure HCQ vs. placebo from baseline to week 26 and week 52
End point description:	more results and details to SF36 and p-value, see attachment
End point type	Secondary
End point timeframe:	from baseline up to week 26 and from baseline up to week 52

End point values	Verum HCQ	Placebo		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	75	78		
Units: score				
arithmetic mean (full range (min-max))				
Health Assessment Questionnaire (HAQ) 26 weeks	0.89 (0.81 to 0.97)	0.89 (0.81 to 0.97)		
Health Assessment Questionnaire (HAQ) 52 weeks	0.86 (0.77 to 0.95)	0.81 (0.72 to 0.89)		
SF-SACRAH 26 weeks	4.19 (3.77 to 4.62)	4.2 (3.79 to 4.6)		



SF-SACRAH 52 weeks	3.99 (3.48 to 4.49)	4.29 (3.84 to 4.74)		
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## Statistical analyses

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No statistical analyses for this end point

## Adverse events

### Adverse events information

Timeframe for reporting adverse events:

During the whole trial

Adverse event reporting additional description:

Events were reported to the sponsor close to the time of the visit, SAEs immediately after becoming known within 24 hours. The sponsor's pharmacovigilance department and the medical monitor are responsible for further monitoring. The Safety Monitoring Board decides annually or in case of serious events on the continuation of the study.

Assessment type	Systematic
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### Dictionary used

Dictionary name	MedDRA
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Dictionary version	16.1
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### Reporting groups

Reporting group title	Verum - HCQ
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Reporting group description: -

Reporting group title	Placebo
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Reporting group description: -

Serious adverse events	Verum - HCQ	Placebo	
Total subjects affected by serious adverse events			
subjects affected / exposed	7 / 75 (9.33%)	15 / 78 (19.23%)	
number of deaths (all causes)	1	0	
number of deaths resulting from adverse events	0	0	
Vascular disorders			
Vascular disorder			
subjects affected / exposed	1 / 75 (1.33%)	0 / 78 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Surgical and medical procedures			
Surgical and medical procedures			
subjects affected / exposed	1 / 75 (1.33%)	0 / 78 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Respiratory, thoracic and mediastinal disorders			
Respiratory, thoracic and mediastinal disorder			

subjects affected / exposed	0 / 75 (0.00%)	1 / 78 (1.28%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Injury, poisoning and procedural complications			
Injury, poisoning and procedural complications			
subjects affected / exposed	0 / 75 (0.00%)	3 / 78 (3.85%)	
occurrences causally related to treatment / all	0 / 0	3 / 3	
deaths causally related to treatment / all	0 / 0	0 / 0	
Congenital, familial and genetic disorders			
congenital, familial and genetic disorder			
subjects affected / exposed	0 / 75 (0.00%)	1 / 78 (1.28%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Cardiac disorders			
cardiac disorders			
subjects affected / exposed	0 / 75 (0.00%)	1 / 78 (1.28%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Nervous system disorders			
nervous disorder			
subjects affected / exposed	1 / 75 (1.33%)	1 / 78 (1.28%)	
occurrences causally related to treatment / all	1 / 1	1 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Ear and labyrinth disorders			
Ear and labyrinth disorder			
subjects affected / exposed	0 / 75 (0.00%)	3 / 78 (3.85%)	
occurrences causally related to treatment / all	0 / 0	0 / 3	
deaths causally related to treatment / all	0 / 0	0 / 0	
Eye disorders			
Eye disorders			
subjects affected / exposed	0 / 75 (0.00%)	3 / 78 (3.85%)	
occurrences causally related to treatment / all	0 / 0	0 / 3	
deaths causally related to treatment / all	0 / 0	0 / 0	
Gastrointestinal disorders			

gastrointestinal disorders			
subjects affected / exposed	1 / 75 (1.33%)	0 / 78 (0.00%)	
occurrences causally related to treatment / all	1 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Skin and subcutaneous tissue disorders			
Skin and subcutaneous tissue disorders			
subjects affected / exposed	1 / 75 (1.33%)	0 / 78 (0.00%)	
occurrences causally related to treatment / all	1 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Renal and urinary disorders			
Renal and urinary disorders			
subjects affected / exposed	0 / 75 (0.00%)	1 / 78 (1.28%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Musculoskeletal and connective tissue disorders			
Musculoskeletal disorder			
subjects affected / exposed	1 / 75 (1.33%)	1 / 78 (1.28%)	
occurrences causally related to treatment / all	0 / 32	0 / 50	
deaths causally related to treatment / all	0 / 0	0 / 0	
Infections and infestations			
infection			
subjects affected / exposed	1 / 75 (1.33%)	0 / 78 (0.00%)	
occurrences causally related to treatment / all	1 / 46	0 / 43	
deaths causally related to treatment / all	0 / 0	0 / 0	

Frequency threshold for reporting non-serious adverse events: 1.5 %

<b>Non-serious adverse events</b>	Verum - HCQ	Placebo	
Total subjects affected by non-serious adverse events			
subjects affected / exposed	69 / 75 (92.00%)	23 / 78 (29.49%)	
Vascular disorders			
Hypertension			
subjects affected / exposed	5 / 75 (6.67%)	2 / 78 (2.56%)	
occurrences (all)	7	2	
Nervous system disorders			

Migraine subjects affected / exposed occurrences (all)	3 / 75 (4.00%) 6	2 / 78 (2.56%) 2	
Headache subjects affected / exposed occurrences (all)	9 / 75 (12.00%) 18	7 / 78 (8.97%) 13	
Paraesthesia subjects affected / exposed occurrences (all)	0 / 75 (0.00%) 0	3 / 78 (3.85%) 5	
Dizziness subjects affected / exposed occurrences (all)	5 / 75 (6.67%) 6	1 / 78 (1.28%) 1	
General disorders and administration site conditions Influenza like illness subjects affected / exposed occurrences (all)	12 / 75 (16.00%) 15	11 / 78 (14.10%) 13	
Ear and labyrinth disorders Vertigo subjects affected / exposed occurrences (all)	1 / 75 (1.33%) 2	4 / 78 (5.13%) 4	
Gastrointestinal disorders Nausea subjects affected / exposed occurrences (all)	4 / 75 (5.33%) 5	2 / 78 (2.56%) 2	
Abdominal pain upper subjects affected / exposed occurrences (all)	6 / 75 (8.00%) 10	5 / 78 (6.41%) 6	
Diarrhoea subjects affected / exposed occurrences (all)	7 / 75 (9.33%) 8	2 / 78 (2.56%) 2	
Gastritis subjects affected / exposed occurrences (all)	5 / 75 (6.67%) 5	2 / 78 (2.56%) 5	
Skin and subcutaneous tissue disorders Rash			

subjects affected / exposed occurrences (all)	6 / 75 (8.00%) 8	2 / 78 (2.56%) 2	
Psychiatric disorders Depressed mood subjects affected / exposed occurrences (all)	4 / 75 (5.33%) 4	0 / 78 (0.00%) 0	
Musculoskeletal and connective tissue disorders Arthralgia subjects affected / exposed occurrences (all)	3 / 75 (4.00%) 3	2 / 78 (2.56%) 7	
Back pain subjects affected / exposed occurrences (all)	4 / 75 (5.33%) 4	10 / 78 (12.82%) 12	
Joint effusion subjects affected / exposed occurrences (all)	2 / 75 (2.67%) 4	1 / 78 (1.28%) 1	
Muscle disorder subjects affected / exposed occurrences (all)	7 / 75 (9.33%) 7	7 / 78 (8.97%) 10	
Neck pain subjects affected / exposed occurrences (all)	1 / 75 (1.33%) 1	2 / 78 (2.56%) 4	
Osteoarthritis subjects affected / exposed occurrences (all)	4 / 75 (5.33%) 6	8 / 78 (10.26%) 9	
Infections and infestations Nasopharyngitis subjects affected / exposed occurrences (all)	4 / 75 (5.33%) 6	4 / 78 (5.13%) 5	
Upper respiratory tract infection subjects affected / exposed occurrences (all)	8 / 75 (10.67%) 8	10 / 78 (12.82%) 12	
Urinary tract infection subjects affected / exposed occurrences (all)	1 / 75 (1.33%) 4	4 / 78 (5.13%) 7	
Bronchitis			

subjects affected / exposed	9 / 75 (12.00%)	1 / 78 (1.28%)	
occurrences (all)	9	2	
Gastroenteritis			
subjects affected / exposed	2 / 75 (2.67%)	7 / 78 (8.97%)	
occurrences (all)	3	9	

## More information

### Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
15 January 2014	The main reason for the amendment was to clarify and to find better wordings for the inclusion and exclusion criteria.
25 June 2014	The primary reason for the amendment is the additional information about possible cardiomyopathy with resulting heart failure when taking HCQ (reason: Fachinformation/Product information had been changed)
03 November 2014	The primary reason for the amendment is the change of production of the IMP by another pharmacy.
18 December 2015	The primary reason for the amendment was the adjustment of the primary and secondary outcome parameters and the resulting adjustment of the subject numbers. The coprimary outcome parameter of xray progression was changed into a secondary parameter. Therefore, the subject number was reduced to 220.

Notes:

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### Interruptions (globally)

Were there any global interruptions to the trial? No

### Limitations and caveats

None reported

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### Online references

<http://www.ncbi.nlm.nih.gov/pubmed/34215704>