Clinical trial results:
The effect of liraglutide on bone turnover, bone mass and bone cell function

Summary

EudraCT number	2015-001284-40
Trial protocol	DK
Global end of trial date	02 October 2017

Results information

Result version number	v1 (current)
This version publication date	04 January 2020
First version publication date	04 January 2020

Trial information

Trial identification

Sponsor protocol code	160315

Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	-
WHO universal trial number (UTN)	-

Notes:

Sponsors

Sponsor organisation name	Aarhus University Hospital, Dept. of Endocrinology and Internal Medicine
Sponsor organisation address	Palle Juul-Jensens Boulevard 95, Aarhus N, Denmark, 8200
Public contact	Department of Endocrinology, Aarhus University Hospital, katrhygu@rm.dk
Scientific contact	Department of Endocrinology, Aarhus University Hospital, katrhygu@rm.dk

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	18 December 2019
Is this the analysis of the primary completion data?	Yes
Primary completion date	02 October 2017
Global end of trial reached?	Yes
Global end of trial date	02 October 2017
Was the trial ended prematurely?	No

Notes:

General information about the trial

Main objective of the trial:

The aims of the study are to investigate the effect of the GLP-1 analogue liraglutide ("Victoza") in participants with type 2 diabetes on bone turnover, bone mass, and bone structure.

Protection of trial subjects:

Participants were given oral and written information concerning the study and any possible harmfull side-effects prior to giving informed consent.

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	01 June 2015
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	No

Notes:

Population of trial subjects

Subjects enrolled per country

Country: Number of subjects enrolled	Denmark: 60
Worldwide total number of subjects	60
EEA total number of subjects	60

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)	31
From 65 to 84 years	29
85 years and over	0

Subject disposition

Recruitment

Recruitment details: -

Pre-assignment

Screening details:
Biochemistry and DXA-scan

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, Carer, Assessor

Arms

Are arms mutually exclusive?	Yes
Arm title	Treatment

Arm description:
Liraglutide 1.8 mg/day

Arm type	Experimental
Investigational medicinal product name	Liraglutide
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Concentrate for solution for injection
Routes of administration	Subcutaneous use

Dosage and administration details:
Liraglutide up to 1.8 mg s.c. per day for 180 days

Arm title	Placebo

Arm description:
Placebo

Arm type	Placebo
Investigational medicinal product name	Saline, placebo for PR1
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Concentrate for solution for injection
Routes of administration	Subcutaneous use

Dosage and administration details:
Up to 1.8 mg s.c. per day for 180 days

Number of subjects in period 1	Treatment	Placebo
Started	30	30
Completed	27	29
Not completed	3	1
Personal reasons	-	1
Adverse event, non-fatal	3	-

Baseline characteristics

Reporting groups	
Reporting group title	overall trial

Reporting group description: -

Reporting group values	overall trial	Total	
Number of subjects	60	60	
Age categorical Units: Subjects			
In utero		0	
Preterm newborn infants (gestational age < 37 wks)		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)		0	
From 65-84 years		0	
85 years and over		0	
Age continuous Units: years			
arithmetic mean	63		
full range (min-max)	42 to 78	-	
Gender categorical Units: Subjects			
Female	30	30	
Male	30	30	

End points

End points reporting groups	
Reporting group title	Treatment
Reporting group description: Liraglutide 1.8 mg/day	
Reporting group title	Placebo
Reporting group description: Placebo	

Primary: Change in plasma CTX from baseline to end of study	
End point title	Change in plasma CTX from baseline to end of study
End point description:	
End point type	Primary
End point timeframe: Baseline, week 1, week 4, week 13, week 26	

End point values	Treatment	Placebo		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	30	30		
Units: micrograms per liter				
number (confidence interval 95%)	0.07 (0.03 to 0.10)	0.03 (0.00 to 0.06)		

Statistical analyses

Statistical analysis title	Linear mixed effects model
Comparison groups	Placebo v Treatment
Number of subjects included in analysis	60
Analysis specification	Pre-specified
Analysis type	other
P-value	< 0.05
Method	Mixed models analysis

Secondary: Procollagen type I N-terminal propeptide	
End point title	Procollagen type I N-terminal propeptide
End point description:	
End point type	Secondary

End point timeframe:
Baseline, weeks 1, 4, 13, and 26

End point values	Treatment	Placebo		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	30	30		
Units: Micrograms per liter				
number (confidence interval 95%)	0.8 (-2.3 to 3.9)	2.0 (-1.0 to 5.0)		

Statistical analyses

No statistical analyses for this end point

Secondary: Osteocalcin

End point title	Osteocalcin

End point description:

End point type	Secondary

End point timeframe:
Baseline, weeks 1, 4, 13, and 26

End point values	Treatment	Placebo		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	30	30		
Units: Micrograms per liter				
number (confidence interval 95%)	0.9 (-0.2 to 1.9)	0.5 (-0.5 to 1.5)		

Statistical analyses

No statistical analyses for this end point

Secondary: Total hip areal bone mineral density

End point title	Total hip areal bone mineral density

End point description:

End point type	Secondary

End point timeframe:
Baseline, week 1, 4, 13, and 26

End point values	Treatment	Placebo		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	30	30		
Units: grams per cm2				
number (confidence interval 95%)	0.00 (0.00 to 0.01)	0.00 (-0.02 to 0.00)		

Statistical analyses

No statistical analyses for this end point

Secondary: Glycated hemoglobin A1c

End point title	Glycated hemoglobin A1c

End point description:

End point type	Secondary

End point timeframe:

Baseline, week 1, 4, 13, and 26

End point values	Treatment	Placebo		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	30	30		
Units: mmol per mol				
number (confidence interval 95%)	-6 (-8 to -4)	-2 (-4 to 0)		

Statistical analyses

No statistical analyses for this end point

Adverse events

Adverse events information	
Timeframe for reporting adverse events: Baseline - two weeks after last visit (week 26)	
Assessment type	Systematic
Dictionary used	
Dictionary name	MedDRA
Dictionary version	10
Reporting groups	
Reporting group title	Treatment
Reporting group description: Liraglutide 1.8 mg/day	
Reporting group title	Placebo
Reporting group description: -	

Serious adverse events	Treatment	Placebo	
Total subjects affected by serious adverse events			
subjects affected / exposed	0 / 30 (0.00%)	0 / 30 (0.00%)	
number of deaths (all causes)	0	0	
number of deaths resulting from adverse events	0	0	

Frequency threshold for reporting non-serious adverse events: 5 %

Non-serious adverse events	Treatment	Placebo	
Total subjects affected by non-serious adverse events			
subjects affected / exposed	20 / 30 (66.67%)	13 / 30 (43.33%)	
Nervous system disorders			
Dizziness			
subjects affected / exposed	2 / 30 (6.67%)	0 / 30 (0.00%)	
occurrences (all)	2	0	
Tiredness			
subjects affected / exposed	4 / 30 (13.33%)	2 / 30 (6.67%)	
occurrences (all)	4	2	
Gastrointestinal disorders			
Gastrointestinal complaints	Additional description: Diarrhoea, constipation, loss of appetite, nausea, abdominal pains, reflux		
subjects affected / exposed	20 / 30 (66.67%)	13 / 30 (43.33%)	
occurrences (all)	20	13	

Endocrine disorders Hypoglycemia subjects affected / exposed occurrences (all)	 3 / 30 (10.00%) 3	 0 / 30 (0.00%) 0	

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? No

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

None reported