Diagnose of GH-deficiency: comparing the dietary-protein test with conventional Growth Hormone Stimulation Tests

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To investigate if there is a correlation between the peak GH concentrations after ingestion of gelatin protein and the peak GH concentrations after the two standard tests (GHST) in order to discriminate between GHD and non-GHD. To investigate the…

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Hypothalamus and pituitary gland disorders
Study type	Interventional

Summary

ID

NL-OMON35620

Source
ToetsingOnline

Brief title
Protein as alternative GHST

Condition

- Hypothalamus and pituitary gland disorders

Synonym
Children who are too small for their age, Growth retardation

Research involving
Human

Sponsors and support

Primary sponsor: Universiteit Maastricht, Human Biology

Source(s) of monetary or material Support: TIFN

Intervention

Keyword: growth hormone stimulation test (GHST), protein

Outcome measures

Primary outcome

correlation between the tests

coeficient of variation within a test

Secondary outcome

Side effects during the tests

Study description

Background summary

Low GH concentrations are a characteristic for children who are too small for their age. GH has a main function in linear growth and bodycomposition. Protein ingestion stimulates the secretion of GH in adults. GH secretion after protein ingestion is different between adult with growth hormone deficiency (GHD) en adults without GHD. In order to determine whether a child is GHD or not, growth hormone stimulationt tests are performed. Current tests are uncomfortable for the children due to side effects and are on pharmacological basis, stimulating GH release directly via only one single pathway in the complex physiological regulation of GH secretion. Stimulation of GH release via one single pathway results in the induction of a high inter individual variation in test outcomes.

Study objective

To investigate if there is a correlation between the peak GH concentrations after ingestion of gelatin protein and the peak GH concentrations after the two standard tests (GHST) in order to discriminate between GHD and non-GHD.
To investigate the differences in coefficient of variation between the different tests (arginine, clonidine, protein)
To investigate the frequency of side effects in the different tests (arginine, clonidine, protein).

Study design

Three tests are perfomed in children who are too small for their age and meet the inclusion criteria. The arginine and clonidine test are standard tests. The protein test is new. All three tests are performed randomized on three mornings.

Arginine-test:
The arginine test is one of the standard test to determine GH-deficiency in children. The test is performed in the morning after an overnight fast. Arginine hydrochloride (0.5 g/kg bodyweight) will infused for 30 minutes. Blood samples are taken to measure growth hormone levels at -15, 0, 30, 45, 60, 75,90 and 120 minutes after the start of the infusion.

Clonidine test:
The clonidine test is one of the standard tests to determine GH-deficiency in children. The test is performed in the morning after an overnight fast. Clonidine (0,15 mg / m2) is ingested orally. Blood samples are taken to measure growth hormone levels at -15, 0, 30, 45, 60, 75,90 and 120 minutes after the ingestion of clonidine.

Protein test:
In this test subjects receive a protein drink, containing complete gelatin protein with 8 lemon drops for the taste. Gelatin protein (Solugel LMC/3, PB Gelatins GmbH, Nienburg/Weser, Germany) is a dietary protein and is found to be the strongest GH stimulator among proteins [8].
For the protein test, subjects will arrive in the morning (08:00h) in fasted state, they are instructed to drink and eat nothing after 22:00h the day before the testday At 8:30h, subjects receive a drink, which contains 0.6 gram protein per kg bodyweight in approximately 100 ml water. Blood samples are taken every 20 minutes for 180 minutes to measure growth hormone levels.

The Arginine and Clonidine test are quite high in reliability, sensitivity and specificity among the single pharmacological test, therefore these tests are used in this study protocol to compare them with the alternative gelatin protein test.
The GH-concentrations in all tests will be measured using an ultrasensitive GH chemiluminescence immunoassay (Beckman Coulter, Harbor Blvd. Fullerton, U.S.A.)

Intervention

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Study burden and risks

This research is neither beneficial nor harmful to the subjects. Allergic reactions on gelatin protein are possible, but not common. In the screening, test persons with a known allergy for gelatin protein are excluded. No side-effect are mentioned in previous studies, using gelatin protein. There are no further risks for the subjects in undergoing the standard clinical tests or consuming the test-drink, as the standard clinical tests are used in hospitals to determine GHDeficiency and the protein used are food-proof and present in our daily diet. In our previous studies we used gelatin protein 0.6 g per kg bodyweight and no adverse or side effects were found.
The blood sampling in this study does not include any other risks for the subjects, apart from its usual risk of minor bruising.
This study is an non-therapeutic groups related study, with children from 6-10 years old. On forehand the study is performed in an adult GHD population. Since a good diagnosis of GHD is important in children, in order to start GH therapy, it is important to test the gelatin -test also in children to observe whether the gelatin test shows a discrimination between GHD and non-GHD. Gelatin protein will stimulate the GH secretion more physiological than the single pharmacological tests will do. Furthermore no side effects are mentioned using the gelatin test, while most of the single pharmacological tests know side-effects.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Children (2-11 years)

Inclusion criteria

Children with
* Height less than -2,5 SDS or
* Deviation from target height more than 1.3 SDS or
* Deviation of growth more than -0.25 SDS/year.

Exclusion criteria

Children will be excluded if other reasons than those related to GH for growth retardation were present, e.g. tumors.
Turner syndrome
Having a food allergy (gelatine protein)
Use of medications
Instable weight
Disorders as cancer, cardiovascular diseases, diabetics, anorexia nervosa

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Masking:	Single blinded (masking used)
Control:	Uncontrolled

Primary purpose:	Diagnostic

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	05-11-2010
Enrollment:	8
Type:	Actual

Medical products/devices used

Product type:	Medicine
Brand name:	arginin
Generic name:	arginin
Product type:	Medicine
Brand name:	clonidin
Generic name:	clonidin
Registration:	Yes - NL intended use
Product type:	Medicine
Brand name:	gelatin
Generic name:	gelatin

Ethics review

Approved WMO

Date:	09-03-2010
Application type:	First submission
Review commission:	CCMO: Centrale Commissie Mensgebonden Onderzoek (Den Haag)

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	EUCTR2010-018781-23-NL
CCMO	NL29178.000.10