

Hormone Disorders

Constitutional Delay of Growth and Puberty

Patient's Guide



Average readability

Introduction

This leaflet aims to provide information about Constitutional Delay of Growth and Puberty. It will discuss information on how it is diagnosed, treated and some of the problems it may cause. Hopefully, this leaflet will help you to understand this condition and give you a basis for discussions with your family doctor or specialist team.



What is Constitutional Delay of Growth and Puberty?

Constitutional delay of growth and puberty (CDGP) is a condition in which temporary short stature occurs due to a delay in pubertal development. This condition is not the result of physical abnormalities, and occurs in individuals who are otherwise healthy. It is also more common in boys than in girls but is equally disturbing for both sexes.

Which changes occur during puberty?

Puberty is defined as the process of changing from a child into an adult. These changes include breast development in girls, enlargement of the penis and the growth of testes in boys. These changes have a characteristic pattern in the timing of their appearance and should remain the same even if the start of puberty is delayed.



Normally, puberty begins at an average age of 10–11 years in girls and 12 years in boys. When there are no physical signs of puberty by 13 years in a girl and 14 years in a boy, referral for assessment should be considered.

How can a child's growth potential be determined?

Children show variation in the age at which they start puberty. This means that age alone is not a good indicator of growth potential. One way to effectively determine growth potential is through bone age. When babies are born, there are wide gaps between the ends of the long bones.

These gaps allow space for the bones to grow. As age progresses, the gaps lessen and on the completion of puberty the bones fuse and no more growth is possible.

Measuring this gap between bones (bone age) will indicate how much time remains for your child to grow. This can be done by taking an x-ray of the left hand and wrist and comparing this measure to the child's age.

Most children who are small for their age will have a delayed bone age and some tall children can have advanced bone ages. With this information a growth specialist can determine how much growth is still possible.



How does CDGP affect the normal growth spurt?

The pubertal growth spurt is a rapid increase in height and weight, usually occurring at age 10–12 in girls and 12–14 in boys. When the growth spurt is delayed, as in CDGP, the peak growth rate of the growth spurt is reduced. Also, boys with this condition tend to progress through puberty more slowly.

The problem is therefore made worse because final height and sexual development are reached at an even later age than would be expected.

Traditionally, it has been thought that the timing of the onset of the growth spurt had no effect on final adult height because there is only a delay in the bone age. However, more recently, it has been demonstrated that children who have **extremely** delayed puberty may not reach a final height appropriate for their parental height.

Which other diagnoses should be excluded?

It is often difficult to distinguish CDGP from other conditions which produce similar effects. As well as ruling out common medical problems, the growth specialist may wish to exclude some of the following rarer conditions:

- **Gonadal Failure:** In this condition the testes or ovaries fail to produce their own hormones. A blood test is carried out to detect this failure.
- **Turner Syndrome:** This is a genetic condition only occurring in girls which slows growth as well as puberty. It can also have effects on the heart and kidneys. Girls with delayed puberty should undergo a chromosome assessment to exclude this condition as a possible diagnosis.
- **Bone Dysplasia:** The main characteristic of this condition is abnormal bone development. If this is seen in your child, a diagnosis of this condition should be considered.
- **Growth Hormone Deficiency:** Children with growth hormone deficiency in this age group will be usually very much shorter than those with CDGP.



What is the treatment for CDGP?

The normal duration of puberty in boys and girls is between three and four years. In children with CDGP, usually no treatment is necessary. If help is required, sex hormone treatment can speed the process up, to bring a child into line with his/her peer-group. However, progress through puberty should not be faster than one to two years.

Treatment will focus on two features: Growth acceleration and development of secondary sexual characteristics. Girls will be treated with a low dose of oestrogen. This is given as a daily tablet, for six months to a year, or part of a patch applied to the skin.

This will induce breast development at an early stage with the appropriate growth acceleration. Treatment is continued until the child's own puberty is overtaking the development produced by the administered oestrogen.

In boys, a low dose of testosterone can be given to start the growth spurt. This is given either as an injection every month or a tablet every day for three to six months. Sometimes a low dose of testosterone gel can be used instead.



For those older boys who are very concerned about their lack of development of secondary sexual characteristics as well as slow growth, testosterone can be given through an injection. This will start the development of secondary sexual characteristics as well as the growth spurt. This is the more usual treatment for boys.

It is important to mention that testosterone treatment does not reduce the adult height that the boy can expect to reach. It only affects the timing of the growth spurt and the age at which it is achieved.

What are the emotional effects of CDGP in children?

Adolescence is characterised by social changes, adaptation to adult life and the beginning of relationships with the opposite sex. Many children with CDGP, particularly boys, have great difficulty in coping with these changes.

These difficulties mostly relate to their height and, as they get older, to their lack of sexual development.

As a result, some children may respond by acting aggressively or immature around others. If this behaviour disrupts school activity or life at home, counselling should be considered.



What are other sources of useful information?

The goal of this leaflet was to provide a basic overview of CDGP.

Educational material can also be found by contacting the following organisations:

- **European Society for Paediatric Endocrinology**
Starling House
1600 Bristol Parkway North
Bristol
BS34 8YU
espe@eurospe.org
Telephone +44 (0) 1454 642246
www.eurospe.org
- **British Society of Paediatric Endocrinology and Diabetes**
bsped@endocrinology.org
<https://www.bsped.org.uk/>
- **Child Growth Foundation**
info@childgrowthfoundation.org
Telephone +44 (0) 208 995 0257
www.childgrowthfoundation.org
- **The Endocrine Society**
www.endo-society.org



You can also consult your specialist team for additional information in your local area.

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This leaflet is part of the **Hormone Disorders Series**

The following are also available:

Growth Hormone Deficiency

Puberty and the Growth Hormone Deficient Child

Precocious Puberty

Emergency Information for Children with Cortisol and GH Deficiencies and those Experiencing Recurrent Hypoglycaemia

Congenital Adrenal Hyperplasia

Growth Hormone Deficiency in Young Adults

Multiple Pituitary Hormone Deficiency

Diabetes Insipidus

Craniopharyngioma

Intrauterine Growth Retardation or Small for Gestational Age

Hyperthyroidism

Hypothyroidism

Type 2 Diabetes and Obesity

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