Constitutional Delay of Growth & Puberty

Series N.10

Patient's Guide

Average Readability Leaflet

Constitutional Delay of growth and Puberty - Series 10 (Revised August 2006)

This leaflet was produced by Fernando Vera MSc and Prof Gary Butler at the Institute of Health Sciences, University of Reading, Reading, UK (August, 2006). Some portions of the text were extracted or modified from the Growth and Growth Disorders Booklet Series (Third edition, 2000)* and may be used in conjunction with these as they provide a choice of leaflets providing the same information, but for people of different ages and reading abilities. The numbering sequence in each series is the same for easy cross-reference. The original leaflet series can be also obtained from the links given at the end.

All illustrations were created and produced by Fernando Vera MSc.

This leaflet is part of the Hormone Disorders Leaflet Series. The following are also available:

Series N 3. Puberty and the Growth Hormone Deficient Child.

Series N 4. Precocious Puberty

Series N 5. Emergency Information for Children with Cortisol and GH Deficiencies and those Experiencing Recurrent Hypoglycaemia.

Series N 6. Congenital Adrenal Hyperplasia

Series N 7. Growth Hormone Deficiency in Young Adults.

Series N 10. Constitutional delay of growth and puberty

Series N 11. Multiple Pituitary Hormone Deficiency

Series N 12. Diabetes Insipidus

Series N 13. Craniopharyngioma

Series N 14. Intrauterine Growth Retardation or Small Gestational Age

Series N 15.a. Hyperthyroidism

Series N 15.b. Hypothyroidism

Series N. 16. Type 2 Diabetes and Obesity

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Introduction

This leaflet aims to provide information about Constitutional Delay of Growth & Puberty. It will discuss information on how it's 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 GP or specialist team.

What is Constitutional Delay of Growth & Puberty?

Constitutional delay of growth & 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's 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 should begin at an average age of 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 the 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's often difficult to distinguish CDGP from other conditions which produce similar effects. The growth specialist may wish to exclude some of the following 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 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, treatment may shorten this duration in order 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.

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 anabolic steroids can be given to start the growth spurt. This is given either as one or half a tablet every day for three to four months.

For those children who are concerned about their development of secondary sexual characteristics, testosterone can be given through injections, usually every month, or daily tablets. 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 these treatments (anabolic steroids or testosterone) do not alter the final height achieved. They only affect the timing of growth and the age at which it's achieved.

Other Treatments may include gonadotropins in boys, or pulsatile gonadotropin releasing hormone treatment in boys or girls.

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.

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What are other sources of useful of information?

The goal of this leaflet was to provide a basic overview of CDGP. Further information can be found in the following sources:

- **European Society for Paediatric Endocrinology**
  ESPE Secretariat, BioScientifica
  Euro House 22 Apex Court Woodlands, Bristol BS32 4JT - UK
  Telephone No: + 44 (0) 01454 642208
  Internet: http://www.eurospe.org/
- **British Society for Paediatric Endocrinology and Diabetes**
  BSPED Secretariat, BioScientifica
  Euro House 22 Apex Court Woodlands, Bristol BS32 4JT - UK
  Telephone No: + 44 (0) 01454 642208
  Internet: http://www.bsped.org.uk/
- **Child Growth Foundation**
  2 Mayfield Avenue, Chiswick London W4 1PW UK.
  Telephone +44 (0) 20 8995 0257
  Internet: http://www.childgrowthfoundation.org/

You can also consult your doctor or nurse for additional information in your local area