



British Society for Paediatric Endocrinology and Diabetes

EARLY ("PRECOCIOUS") PUBERTY

Puberty is the process of body changes from the first signs of adolescence to full adult development. It is brought about by a series of chemical signals (hormones), sent from the brain to the pituitary gland in the head, then from the pituitary to the sex glands, the ovaries in girls and the testes (testicles) in boys. These in turn make the sex hormones, oestrogen in girls and testosterone in boys, which cause the physical changes of puberty. Normal puberty takes from 4 to 5 years in both sexes but it starts earlier in girls than in boys.

The first sign of puberty in girls is breast buds, which can start anywhere between age 8-14 but typically start about age 11. Pubic hair follows a few months later, with periods usually starting about 2 years after breast buds are first noticed. Girls have their growth spurt fairly early in puberty and by the time they start their periods, a lot of their growing will have been done. Most girls will have started their periods by the time they are 13 and finish growing by about the age of 15.

In boys, the first sign of puberty is the testicles getting bigger, which is often not very obvious to start with. After a few months, the penis starts to enlarge and pubic hair develops. This can happen anywhere between the ages of 9-15, with most boys noticing the first changes around the age of 12. The growth spurt happens later in boys compared to girls, usually at about age 14, and final height is not reached until 17 or later.

It is normal for there to be some variation in the age at which puberty starts and most children will start theirs two years before or after the average. Thus 95% of girls start their periods between the ages of 11 and 15. Problems most commonly arise through "mistiming" of puberty which is either early ("precocious") or delayed. Precocious puberty is defined as signs of puberty happening before the age of 8 in a girl or 9 in a boy. This is quite a common condition and, for reasons which are not understood, it occurs much more often in girls than in boys. There is also often a family history of early puberty, particularly in mothers.

Sometimes, one part of the puberty process starts on its own, earlier than is usual. This is known as premature thelarche if it is just breast development, and premature adrenarche or pubarche if it is just pubic and body hair development. It is important to tell the difference between this and 'true' or central early puberty as the management of them is different.

Problems

As explained above, during puberty a child's body matures into that of an adult. As well as the obvious physical changes such as breast development, starting periods, body hair growth, voice breaking and starting shaving (depending on the sex of the child), it is also a period of very rapid growth. However, once puberty has finished so does the growth period and usually no further growth is possible thereafter.

If children start puberty much earlier than their friends, there will be the obvious physical differences to deal with. There are also the social issues of young girls dealing with periods (and whether the school is geared up to supporting this) although in reality, because the process of going through puberty matures the brain as well as the body, this is often less of a problem than might be expected. The other big consequence is that if a child has their growth spurt at the age of 8-9, whilst they are likely to be much taller than their friends at that stage, they will stop growing much sooner and so may end up as short adults.



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Investigation

It is often possible from physical examination alone to say whether this is 'true' puberty or just early thelarche or pubarche, especially if this is combined with a bone age X-ray. Sometimes further tests are needed and it may be necessary to do a special stimulation test which can say for definite if this is central early puberty. If central early puberty is confirmed, many children will have an MRI scan of their brain to see if there is a reason as to why things have switched on a bit early.

Treatment

If a child is found to have early thelarche or pubarche, then no specific treatment is needed. In some girls, early pubarche is associated with being overweight and it is important that their weight is controlled as if not, there can be an increased risk of hormonal problems such as polycystic ovarian syndrome (PCOS) and type 2 diabetes later in life.

There are two options for the management of early puberty: The first is to use no active treatment and to let nature take its course. Not only the parents but also the child, the teachers and other important people in the child's life need to understand the condition and to be reminded to treat the child according to actual age rather than maturational age.

The alternative is to switch off the pituitary hormones (gonadotrophins) which trigger puberty. This is done by injection of a gonadotrophin blocker such as Triptorelin or Gosarelin, which is given every 4-12 weeks, depending on the preparation used and how the body responds to it. Usually, this will slow down or stop the physical changes such as breast development (but won't completely reverse changes that have already happened) and return the growth rate to that of a child yet to start puberty. The treatment usually continues until the child is of an age when their peers are starting puberty, so roughly age 10-11.

Future

Since all their peers eventually catch up with them, there are few long-term problems from early puberty. Starting early does not imply finishing early, there is no evidence that girls with early puberty have an early menopause, indeed they seem to have a longer than usual reproductive life. Usually the only long-term concern is growth and in this respect also most children with early puberty do better than the methods of height prediction suggest.

If they have had treatment to delay puberty, once the treatment stops, puberty continues as normal and there are no reported long-term risks to fertility etc.