

# Puberty and Adolescence

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Puberty is the time when the reproductive system matures

Adolescence is the period extending from the onset of puberty to early adulthood between ages 12 and 20.

Adolescence

*Is the period of life during which the child becomes an adult person i.e. the physical , sexual and psychological development are complete .*

*Puberty represents the first part of adolescence .*

Puberty is defined as the period of time during which secondary sexual characteristics develop, menstruation begins and the psychological outlook of the girl changes as she develops a more adult aspect to herself. The end result of puberty is the establishment of the fully physically mature adult woman capable of reproductive performance and fully psychologically developed as an adult .

The physical changes of puberty are divided into five stages;

- breast growth,
- pubic hair growth
- ▮ axillary hair growth
- ▮ the growth spurt and menarche

*The first sign of pubertal development is usually breast growth (thelarche), followed by appearance of pubic hair (pubarche), then (axillary hair), then (menarche).*

*The mean interval between breast budding and menarche is 2.5 years with a standard deviation of about one year.*

## Adrenarche

means increased activity of the suprarenal cortex at puberty with increased production of adrenal androgens which lead to appearance of pubic and axillary hair.

During childhood , the hypothalamus is extremely sensitive to the negative feedback exerted by the small quantities of estradiol & testosterone produced by the child's ovaries .

As puberty approaches , the sensitivity of the hypothalamus is decreased and subsequently , it increase the pulsatile GnRH secretion .

The anterior pituitary responds by progressive secretion of FSH and LH associated with increased secretion of

growth hormone. The ovaries respond to the increase Gonadotrophin secretion by follicular development & estrogen secretion,

Estrogen causes development of the genital organs and the appearance of the secondary sexual characters. With increased estrogen secretion, menarche and cyclic estrogen secretion occurs.

Menarche in girls in the UK is around 12.6 years  
Menarche is influenced by a number of factors and the initiation of the process involves an interaction between percentage body fat and the genetic determinant of the onset of puberty. This percentage body fat is influenced by a number of external factors, e.g. socioeconomic status, allowing good nutrition or psychological problems to influence body weight, e.g. anorexia nervosa. However, there is little doubt that body fat is intimately involved in the co-ordination of the onset of GnRH release .

Early menstrual cycles are in the majority an ovulatory, and cycle length may vary for some considerable years after menarche. It may take some 5-8 years before menstrual cycle normality is established.

Therefore it is again not uncommon that primary dysmenorrhea often postdates menarche. As the an ovulatory state is due to failure of luteinization of follicles and subsequent ovulation.

The lack of production of progesterone means that there is endometrial hyperplasia.

In many girls their menstrual loss can be very heavy.

## **Abnormalities of puberty;**

### **Precocious puberty;**

Precocious puberty is defined as the onset of secondary sexual characteristics prior to the age of 8 years.

Causes of precocious puberty

1-Idiopathic 95%

2-Neurological:

Cerebral tumours

Hydrocephalus

Post meningitis

McCune-Albright syndrome

3-Ovarian tumours

4-Adrenal tumours

5-Gonadotrophin-secreting tumours

6-Exogenous oestrogen

## Treatment ;

Clinician is faced with the problem of reversing the normal onset of puberty. There can be little doubt that the treatment of choice is the use of GnRH analogues, which are extremely effective at obliterating follicle-stimulating hormone (FSH) production by the pituitary. By doing this, the prepubertal state is re-established and the child can remain on this therapy until aged about 11.5-12 years when the therapy can be withdrawn and the normal onset of puberty will ensue. Any breast or pubic hair development that has occurred prior to the diagnosis will usually be reversible as the hypo-estrogenic state prevents further growth, and in most cases this results in some resolution of early change. However, if the secondary sexual characteristic changes have been much greater and full development, little effect can be expected by this therapy on the physical changes.

Similar success can be achieved with those children with neurological problems. Children who are found to have ovarian or adrenal tumours, or gonadotrophin-secreting tumours, should be treated surgically and their problems will resolve.

## **Menstrual problem;**

As can be seen in the description of puberty, menstrual cycles are rarely established as normal ovulatory cycles from the beginning of puberty. It can take many years before the normal ovulatory menstrual cycle is established.

This phenomenon is extremely important for the gynecologist to understand, as the management of these cases is usually without active treatment but by support and understanding of the condition of the child.

## **Heavy menstruation;**

It is important that the clinician takes an accurate history from the child if possible. Normal menstrual loss should not exceed 80 ml during a period, although in 5 % of *individual it is heavier than this and causes no troubles* . The doctor should consider whether or not the child truly has menstrual loss that is serious as a medical condition or menstrual loss that is irritating and distressing without being medically harmful.

The best way to establish which of these is the case is to measure the hemoglobin. If the hemoglobin level is normal, i.e. greater than 12 g/l, then an

explanation should be given to the mother and child the normal

physiology of menstrual establishment, that the manifestation of the menstrual loss is normal and that it may take some time for the cycle to be established.

This condition requires no active treatment. However, it is important that the child is followed up at 6-monthly intervals until the pattern of

menstruation is established, as reassurance

is the most important part of the management process of these girls.

In those girls with haemoglobin levels between 10 and 12 g/l it is apparent that they are losing more blood at menstruation than is desirable. Again, an explanation is required so that the mother and daughter understand the cause of the problem, and the child should be administered iron therapy in order to correct what will be mild iron deficiency anaemia, menstrual loss needs to be reduced and this may be achieved by using

either progestogens cyclically for 21 days or

to use the combined oral contraceptive pill. If they are used, these therapies should be stopped on an annual basis so that assessment may be made as to whether or not the normal pattern of menstruation has been

established through maturation of the hypothalamopituitary-ovarian

access..

Finally, in the child with a haemoglobin of less than 10 g/l, it is obvious that serious anaemia has resulted from menstrual loss. This again requires an explanation but more urgent attention from a medical point of view.

Progestogens are very much less likely to be effective in this group, and the oral contraceptive pill is by far the treatment of choice. It may be given continuously for a short period of time so that the anaemia can be corrected using oral iron, and then the pill may be used in the normal way so that menstrual loss occurs monthly if desired.

Any girl who continues to have menstrual loss which is reported to be uncontrolled by these management strategies should have an ultrasound scan performed to exclude a uterine pathology.

### **Primary dysmenorrhea;**

The pain of primary dysmenorrhoea classically

begins with the onset of menstrual bleeding and persists throughout the first 12-48 h. It is typically a background, constant pain with superimposed spasmodic cramping exacerbations.



**There may be associated gastrointestinal or neurological manifestations, or general malaise.**

**The management of dysmenorrhoea in the teenager is no different from that of the adult. Both the use of non-steroidal anti-inflammatories and the oral contraceptive pill is pertinent in teenagers, but again failure of these medications to control dysmenorrhoea should alert the clinician to the possibility of uterine anomaly and ultrasound imaging of the uterus should be performed to establish whether or not an anomaly exists.**

**REFERENCES;**

**1-DEWHUREST TEXTBOOK OF GYNAECOLOGY AND OBSTETRIC.**

