Amenorrhoea In Adolescents

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Introduction

Adolescent milestones form the basis of a young immature girl child transforming into a mature adult woman. Though the milestones constitute secondary sexual characters such as breast development, pubic hair growth, growth spurt, it is without doubt that menarche is of singular and paramount importance to the adolescent girl and her parents.

Types

Primary Amenorrhea (Speroff et al 1994)
Absence of menses by 16 years of age in the presence of normal secondary sexual characters or by 14 years when there is no visible secondary sexual characteristics.

Secondary Amenorrhea (Speroff et al 1994)
Absence of menstruation of 3 normal menstrual cycles or 6 months in a patient who has had menses before.

Classification

Amenorrhea Associated with lack of secondary sexual characteristics

Abnormal physical examination:

5 alpha reductase deficiency
17,20 desmolase deficiency
Hypogonadotrophic Hypogonadism
Physiological delay
Kallmans Syndromme
Hypothalamo-pituitary dysfunction
C.N.S. Tumors

Hypergonadotrophic Hypogonadism:

Pure gonadal dysgenesis
Sex chromosome Mosaicism
Partial deletion of X chromosomes
Environmental and therapeutic ovarian Toxins
Galactosemia
17 alpha hydroxylase deficiency in XX

Amenorrhoea Associated with presence of secondary sexual characters and anatomical abnormalities

Mullerian Abnormalities
Muller Kustner Rokitansky Hauser Syndromme
Imperforate Hymen
True Hermaphrodites
Prior uterine surgery/ cervical surgery
Infection, PID, Koch's, Schistosomiasis

Vaginal septum
Androgen insentivity
Absent endometrium
Ashermans syndromme

Amenorrhoea with secondary sexual characters with non anatomical causes

1. Pregnancy

2. Pitutary Lesions
   Craniopharingioma
   Non functioning adenomas
   Pitutary microadenoma,
   Empty sella syndrome
   Hormone secreting adenomas
   (Prolactinoma, Cushing syn.)

Sheehan syndromme
Infarction
TB Granuloma

3. Ovarian Failure
   Chemotherapeutic
   Radiotherapeutic
   Alteration in blood supply
   Infections
   Hormone secreting adenomas
   Galactosemia
   Galactosemia
   Savage syndrome
   Autoimmune
   Idiopathic
   Chromosomal Abnormality
   Surgical/Radiological ablation

4. Abnormal GnRH Release
   Anorexia Nervosa
   Pseudocyesis
   Stress induced
   Exercise induced
   Thyroid dysfunction

5. Euestrogenic States
   Obesity, Granulosa cell Tumor
   Hyperandrogenism (PCOD, CAH, Cushings, Androgen secreting tumors)
   Idiopathic.

6. Chronic diseases
   Pulmonary diseases, liver diseases, renal diseases.

Diagnosis & Management

It is imperative that a detailed clinical and family history should be taken; physical and general examination should be done. X rays for bone age should be done. Height/ Weight ratio, secondary sexual characters, hoarseness of voice should be noted. A gentle examination of the external genetialia must be done. (As far as possible vaginal examination should be avoided.)

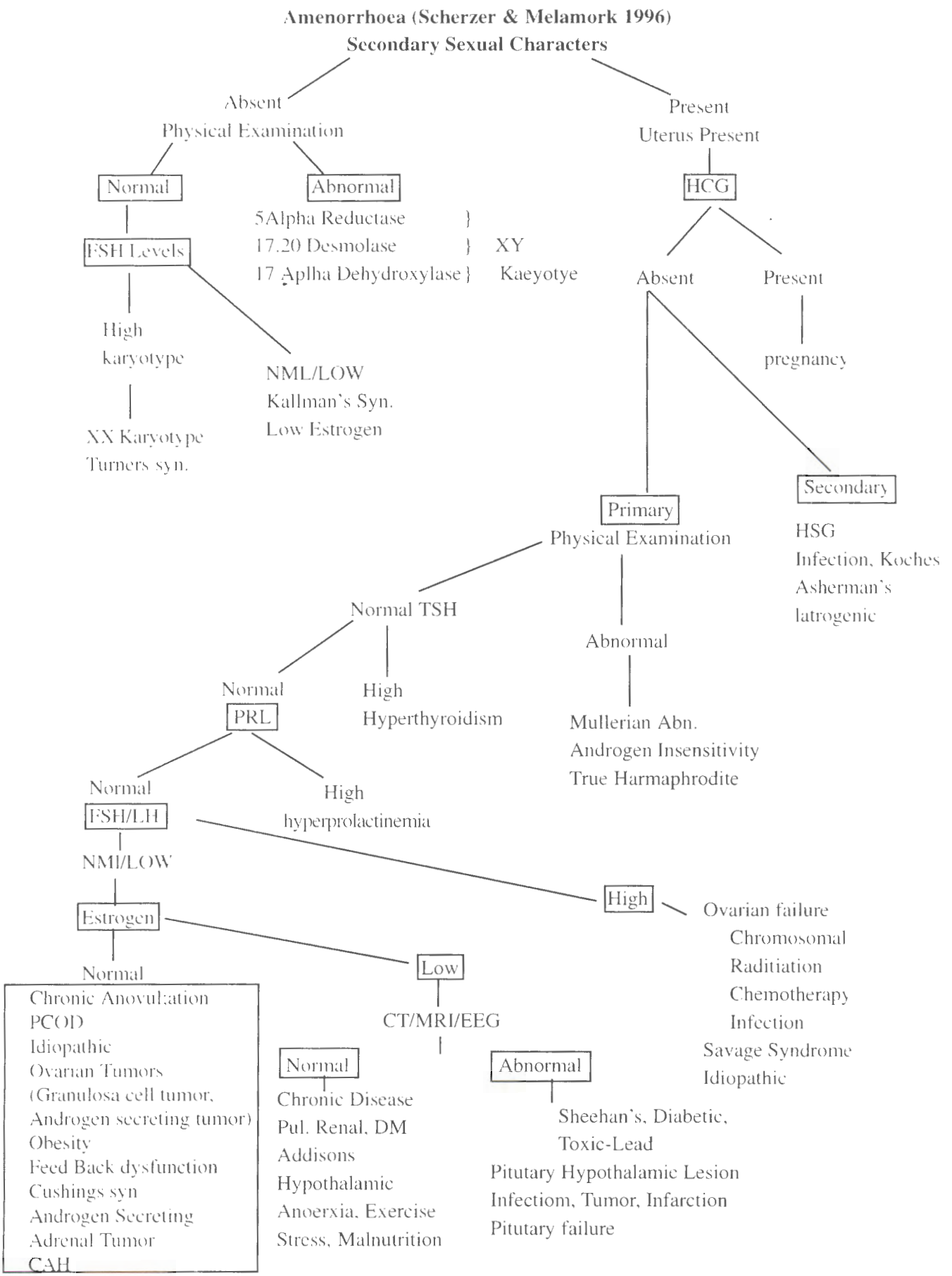
Liberal use of ultrasonography is recommended as it would be quite distressing for a teenager to be subjected to detailed gynaec examinations. Even having a separate timing to see these adolescent patients also would help along with sessions in counsellings and psychiatric evaluation.

An appropriate modality of further investigation in the form of laparoscopy/hysteroscopy (in suspected cases of Ashermans syndrome) may be used as and when necessary.

Karyotyping also is of immense diagnostic help.
Only after this is done, the next two charts may help.

Presence Or Absence Of Uterus With Breast May Help Us In Arriving At A Diagnosis - (Krishna & Patwardhan)

Uterus	Breast	Conditions
1. Present	Absent	Hypogonadotrophic hypogonadism
2. Absent	Present	Gonadal Dysgenesis, Testicular Feminisation, MRKH syndrome
3. Absent	Absent	Agonadism, Enzyme Deficiency
4. Present	Present	Pitutary tumors, PCOD


Amenorrhoea (Scherzer & Melamork 1996)
Secondary Sexual Characters
Absent
Physical Examination
Present
Uterus Present
Normal
Abnormal
HCG
FSH Levels
5Alpha Reductase
17.20 Desmolase
17 Aplha Dehydroxylase
XY
Kaeyotye
Absent
Present
High
karyotype
NML/LOW
Kallman's Syn.
Low Estrogen
pregnancy
XX Karyotype
Turners syn.
Secondary
Primary
Physical Examination
HSG
Infection, Koches
Asherman's
Iatrogenic
Normal TSH
Abnormal
Normal
PRL
High
Hyperthyroidism
Mullerian Abn.
Androgen Insensitivity
True Harmaphrodite
Normal
FSH/LH
High
hyperprolactinemia
NMl/LOW
High
Estrogen
Ovarian failure
Chromosomal
Raditiation
Chemotherapy
Infection
Savage Syndrome
Idiopathic
Normal
Low
Chronic Anovulation
PCOD
Idiopathic
Ovarian Tumors
(Granulosa cell tumor,
Androgen secreting tumor)
Obesity
Feed Back dysfunction
Cushings syn
Androgen Secreting
Adrenal Tumor
CAH
CT/MRI/EEG
Normal
Abnormal
Chronic Disease
Pul. Renal, DM
Addisons
Hypothalamic
Anoerxia, Exercise
Stress, Malnutrition
Sheehan's, Diabetic,
Toxic-Lead
Pitutary Hypothalamic Lesion
Infectiom, Tumor, Infarction
Pitutary failure

Treatment of Amenorrhoea (Primary and Secondary) (Edmunds 1993, Sheil & Turner 1996)

- Physiological delay needs only reassurance
- The mainstay is cyclic estrogen and progesterone to initiate and maintain Secondary sexual characters. In case where Estradiol (E2) levels more than 20pg/ml are present, only progestin should be advocated (minimal E2 level to keep the endometrium receptive for progesterones)
- Estrogen advocated Conjugated Equine Estrogen - 0.625 mg/day
- E2 - 1mg/day daily for 25 days and Progestin added for 12-15 days / 1-2 months. Some recommend daily Estrogen and Progesterone.
- Specific treatment is aimed at the treatment of the primary cause.
- A few common ailments and their treatment of the primary cause.
- Gonadal failure and hypergonadotrophic hypogonadism: mainly supportive replacement of hormones; also in cases of primary ovarian failure, resistant ovarian syndrome, Savage syndrome the same treatment is recommended.
- Pituitary tumors - Surgery alone / Surgery and radiotherapy.
- Hyperprolactenemias respond to Bromocriptine (1.25 - 2.5 mg/day).
- Germinomas are Radiosensitive.
- In patients with PCOD and Amenorrhea and who want to conceive, Progesterone withdrawl or cyclic estrogen and progesterone with Clomiphene is given. In patients with PCOD, ovulation induction with Clomiphene and hCG.
- In Genetic causes, Mosaicism, Gonadal Dysgenesis, Y cell line, the gonads are more prone for malignancy. so surgery is advocated (Gonadectomy)
- Kallman Syndrome and other cryptogonadal states can be treated with GnRh.
- Specific treatment for Anorexia Nervosa, Obesity, Cushing.
- Local causes like Imperforate hymen can be corrected with surgery (hymenectomy).
- MRKH treated with McIndoes vaginoplasty, Williams vulvovaginoplasty, creation of neovagina.
- Asherman's syndrome (secondary amenorrhea) treated with resection with operation Hysteroscope followed by Estrogen Progesterone therapy.
- Genital Tuberculosis is treated with Anti Kochs group of drugs. Specific note of resistant Kochs to be made.
- Appropriate treatment of Thyroid disroders.

Conclusion

Amenorrhea in the adolescent age group is a clinical dilemma requiring special attention and an individualized approach.

The differential diagnosis is to enable the consultant to initiate proper treatment.

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