

# Hormonal disorders in adolescent girls

**Hirsutism**

**PCO**

**Dr.Abdellatif Daraghmeh**

# Objectives

- 1 – provide understanding of endocrine disorders most spesificly the hirsutism and PCO in young female
- 2 - The importance of early diagnosis and forms of the negative impact of the problem
- 3 – increasing the public awarness (young female) to reduce the negative impact of the problem
- 4 - Recommendations

# **Introduction**

Most of our body functions work under the influence of hormones secreted by glands like , thyroid , adrenal and ovaries

# General Endocrine Disorders

- \*Two categories of endocrine disorders

- 1-Excessive production of hormone

- 2-Deficient production of hormone

- \*Manifestations of hormonal disorders reflect the actions of the hormone

- 1-May alter appearance of the individual

- 2-Disorder beginning in children

- 3-Disorder beginning in adult

- 4-May alter metabolism of the individual

**\* Most common cause of endocrine disorders is benign tumor or adenoma**

a- Adenoma may be secretory producing excess hormone

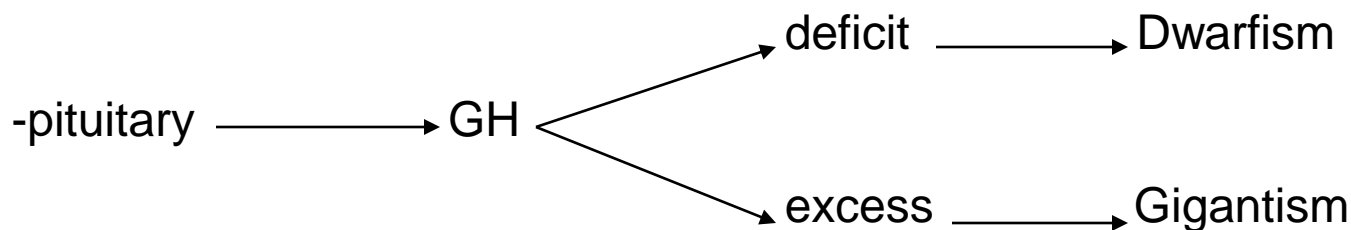
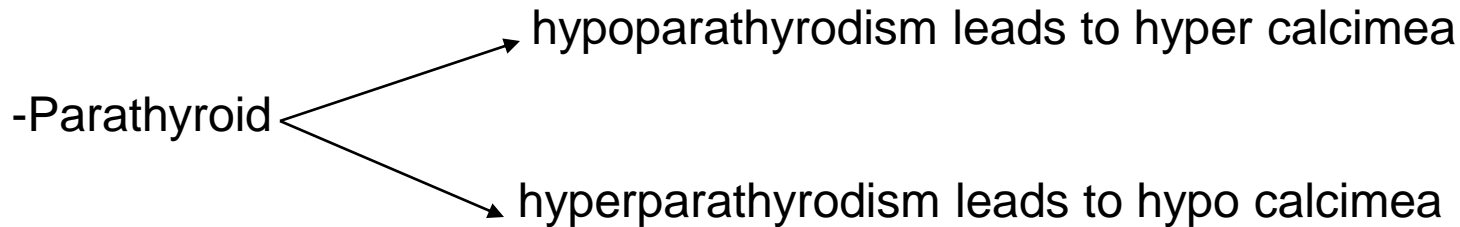
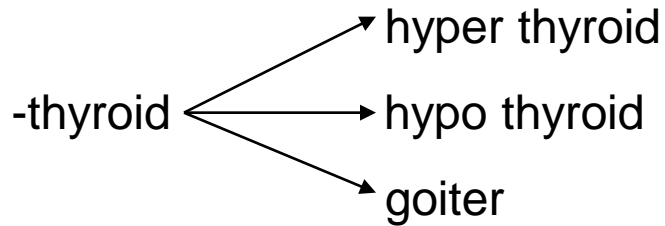
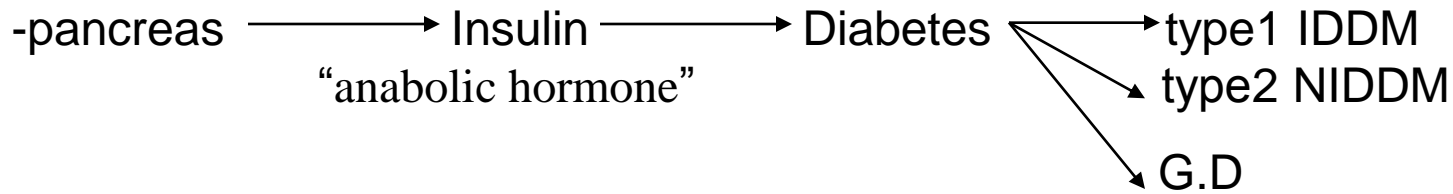
b- Adenoma may be destruction causing a hormonal deficit

c-Target cells may be resistant or insensitive to the hormone creating the effect of a deficit (e.g. Type II Diabetes mellitus)

**\* Other causes of hormonal problems:**

- 1- Congenital defects in the glands
- 2- Hyperplasia of the glands
- 3- Infection of the glands
- 4- Abnormal immune reactions
- 5- Vascular problems
- 6- Ectopic sources of hormones, e.g  
bronchogenic (lung) cancer produces PTH  
or ACTH

# Types of hormonal disorders



## **-Adrenal**

a- hypo ———→ Addison's disease refers to a deficiency of  
adrenocortical secretions

b- hyper ———→ Cushing's Syndrome due to excessive  
glucocorticoids

## **-Ovarian**

a-disorders of m.c.

b-"hirsutism" (PCO)







(a)



(b)



(c)



(d)

**FIGURE 13B**

Oversecretion of growth hormone in adulthood causes acromegaly. Note the changes in this woman's facial features at ages (a) 9, (b) 16, (c) 33, and (d) 52.



An enlarged thyroid gland, or goiter, is usually associated with thyroid hyposecretion that is iodine insufficiency.



**FIG. 20-7 Thyrotoxicosis (Graves disease).** Note large and protruding eyeballs in association with a large goiter. (Seidel et al: *Mosby's guide to physical examination*, ed 4, St Louis, 1999; courtesy Paul W Lidsen, MD, The Johns Hopkins University and Hospital, Baltimore.)



***Young woman with PCOS showing facial hirsutism (A) and axillary acanthosis nigricans (B). The latter is associated with severe insulin resistance and hyperinsulinaemia and is an occasional finding in PCOS (photographs courtesy Dr John Casey, St Vincent's Clinic, Sydney, NSW).***

# HIRSUTISM

## Basic facts about hair

Three types of Hair :

**Lanugo** : Body hair seen in the fetus and newborn

**Vellus** : Fine adult hair covering the body

**Terminal hair** : Thick pigmented hair of scalp and pubic area

Thickness of the terminal hair varies from one individual to other depending upon genetic, and possibly nutritional



## **hirsutism in women**

Excess hair (hirsutism) in women often appears in the places where men have body hair, such as the upper lip and chin, the chest (including around the nipples), the tops of the shoulders and the lower abdomen. The excess hair is usually coarse and dark (different from the fine hair that some women have on their upper lip, chin, breasts and stomach). The hairs also grow longer than normal so, for example, hairs on the upper lip may grow to 1 cm long instead of remaining short, fine and fair.

Reasons for excess hair

## **Extra-responsiveness to hormones**

There are many reasons for this extra-responsiveness to normal amounts of testosterone.

Often, it is inherited; your mother or aunts may have had the same problem.

Some drugs can be responsible, particularly phenobarbitone and phenytoin taken to control epilepsy, Long-term steroids (taken for conditions such as arthritis or inflammatory bowel disease) and ciclosporin (taken for psoriasis, dermatitis or arthritis) can also cause extra hair growth.

**Tumour.** Very occasionally, a tumour of the ovaries or an adrenal gland can be responsible for the excess male hormones, but this is very rare.

# presentation of hirsutism

hirsutism alone

hirsutism and associated pilosebaceous unit  
overactivity (acne)

hirsutism and ovulatory disorders

hirsutism and signs of virilization



# presentation of hirsutism

Hirsutism alone is the greatest challenge, patients usually go to dermatologist

Hirsutism with acne is frequently in teenage girls

Hirsutism with ovulatory disorders comes mostly to gynecologist

Hirsutism with virilization requires immediate work-up

# causes of hirsutism

Excess androgen production

Relative circulating androgen excess and low binding globulins

Excess end organ response

Patient perception

# disorders of excess androgen production

Source of androgen :

Exogenous

Endogenous (most common)

Two primary endogenous sources :

Adrenal glands

**Ovaries**-most common cause is **PCO**

-Other “Neoplastic ovarian disease”

# Polycystic ovary syndrome (PCOS)

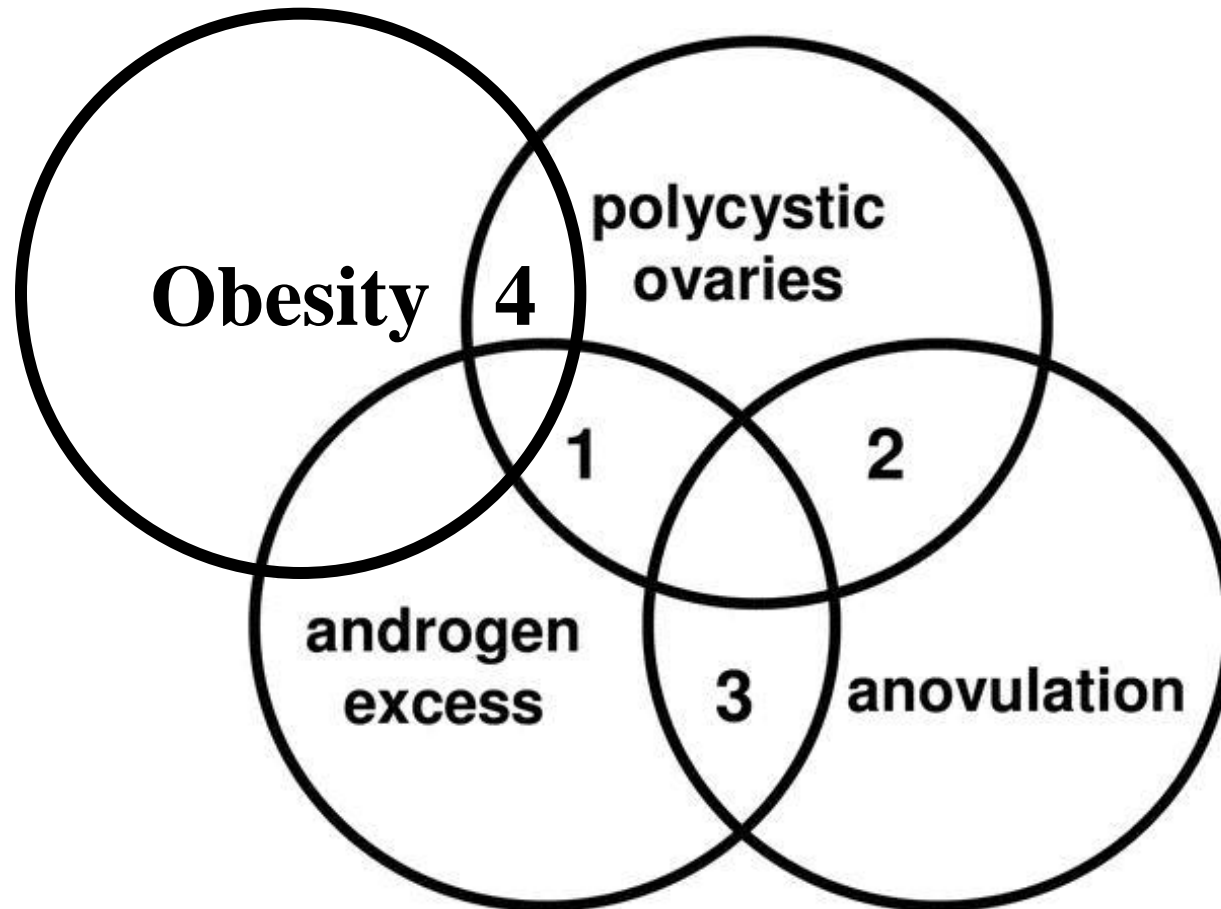
- \*It is the cause of hirsutism in some women.
- \*This syndrome is usually caused by an imbalance between the pituitary and adrenal glands with cysts on the ovary. As a result, the level of male hormone rises
- \*It usually develops in the late teens or early 20s and there are usually other symptoms as hirsutism
- \*Polycystic ovary syndrome sometimes runs in families.
- \*It is diagnosed by blood tests and, usually, an ultrasound scan of the ovaries.
- \*It can be treated with medication.
- \*Women with polycystic ovary syndrome are often obese, and the hirsutism (hairiness) improves if they lose weight.

# Stein-Leventhal Syndrome

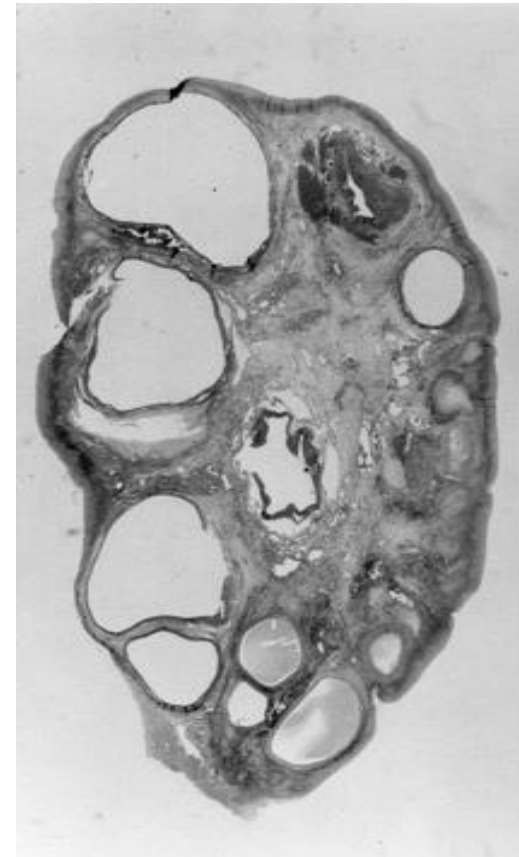
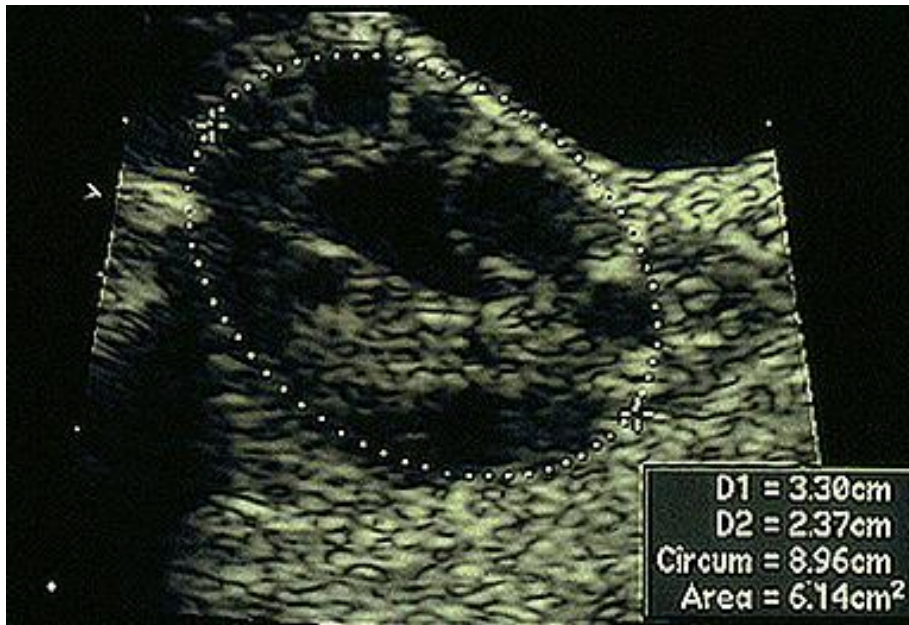
Stein I, Leventhal M. Amenorrhea associated with bilateral polycystic ovaries. *Am J Obstet Gynecol* 1935; 29:181.

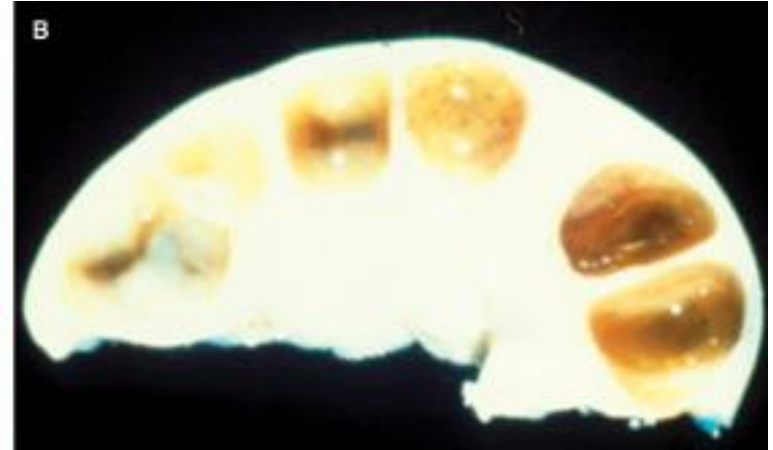
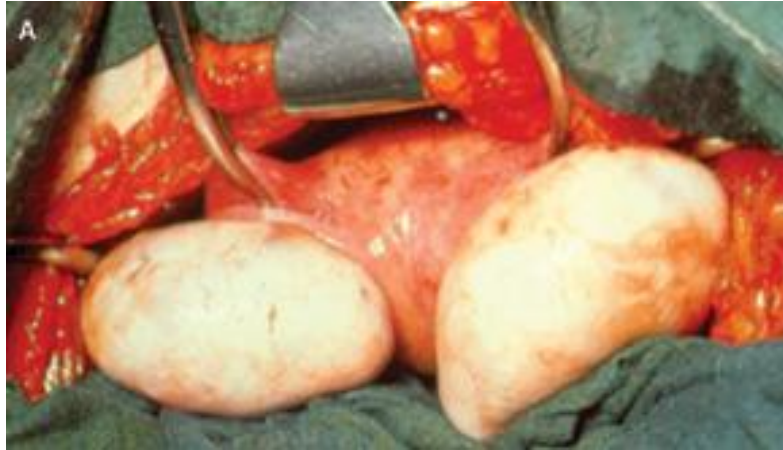
Association between bilateral polycystic ovaries and signs of amenorrhea, oligomenorrhea, hirsutism, and obesity.

# Diagnosis of PCOS



# PCOS: Imaging and Pathology





***A: Polycystic ovaries, showing increased size and a smooth white surface reflecting thickening of the capsule. B: Section through polycystic ovary, showing multiple cysts with diameter < 10 mm arranged around the periphery of the ovary. The stroma is increased, and the ovary enlarged.***



DR. SHERBAHN

ID:

SIEMENS

MD:

T: 02/20/97

\* 13:02:52



08  
75/6/5EV 7.5  
1 CRL  
2 BPO  
3 OFD  
4 HC  
5 AC  
6 TRD  
7 FL  
8 HL  
9 UL  
X TL  
Y FT  
Z BN

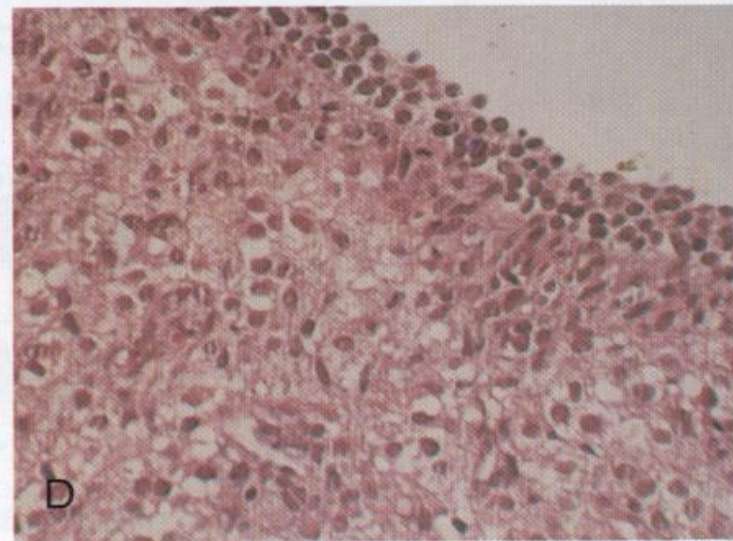
01= 10.2mm  
02= 7.8mm

T8:Calc

B:55/2/1/45/ 58 21M

MI<0.4

30 31



# PCOS: Epidemiology

Prevalence: 4-6% females

Probably same world wide

No difference between blacks and whites

75% of women w/ irregularity or infertility

# PCOS: Signs and Symptoms

## **SYMPTOMS**

**Menstrual irregularity**

**Infertility**

**Hirsutism, acne, etc**

**Obesity**

## **SIGNS**

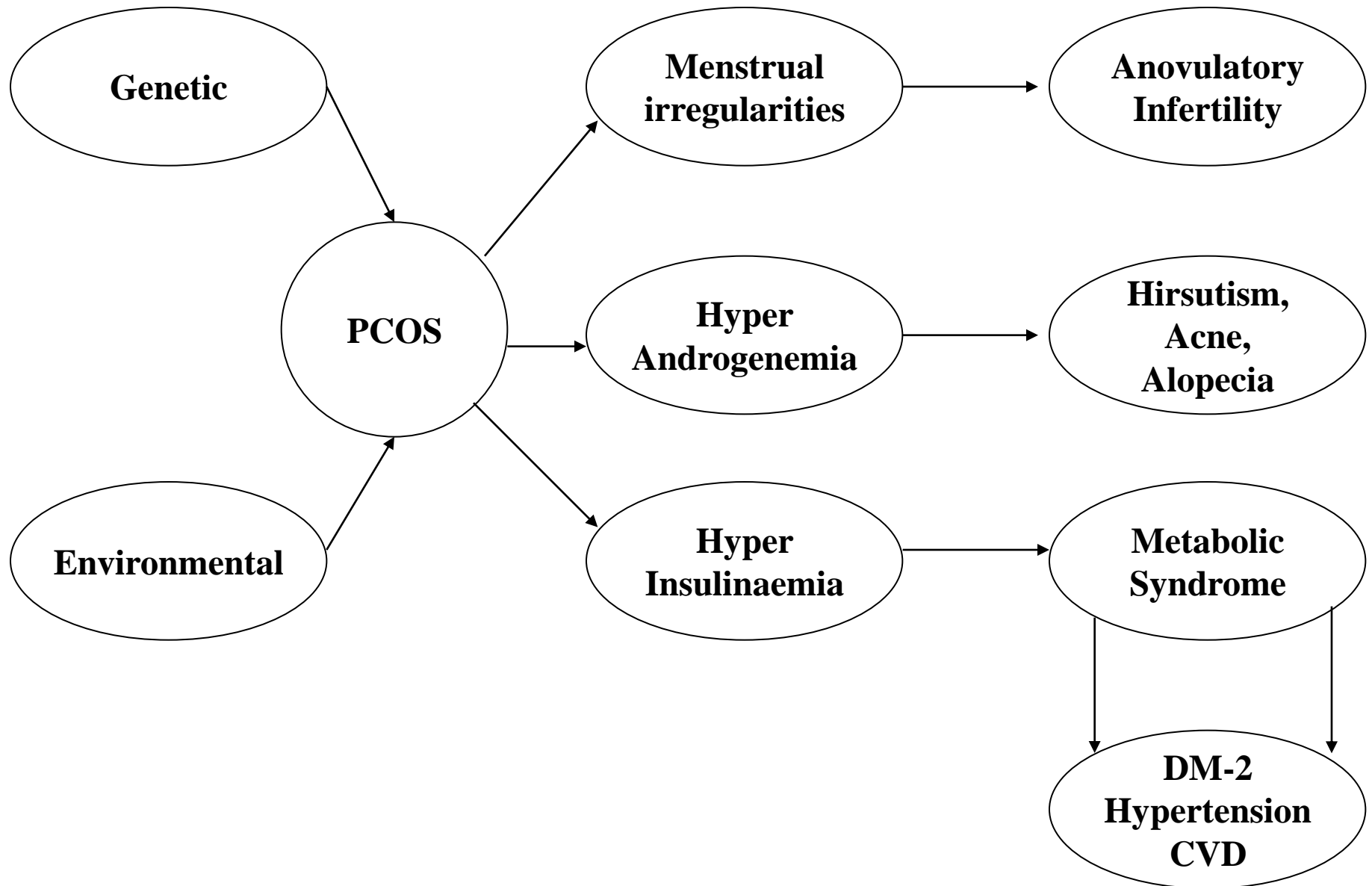
**Hirsutism, acne**

**Obesity**

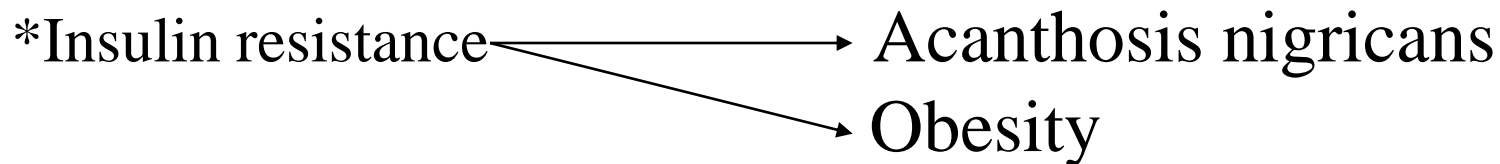
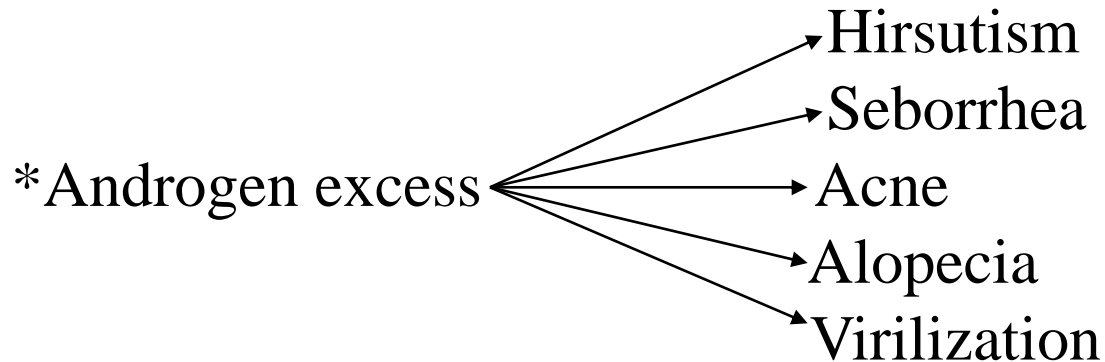
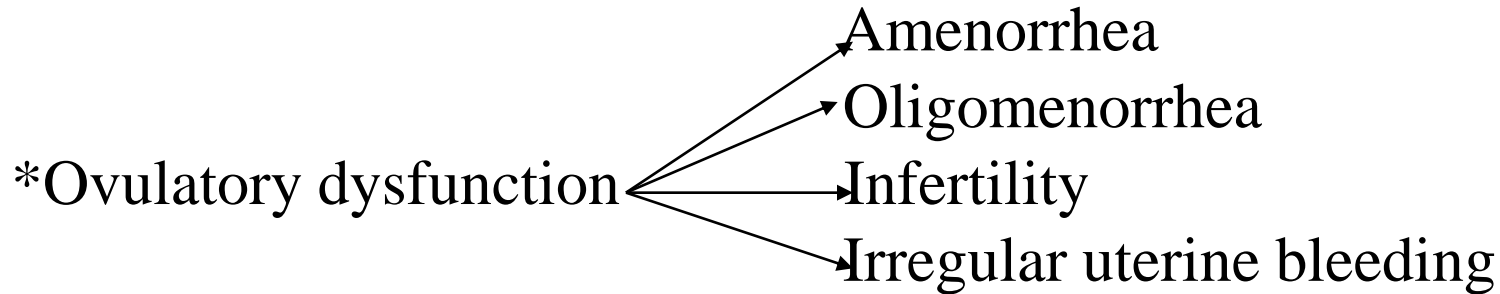
**Ovarian enlargement**

**Acanthosis nigricans**

# Polycystic Ovarian Syndrome



# Clinical Features of PCOS



# Clinical Features of PCOS

Some women with PCOS may never have signs of androgen excess because of genetic differences in target tissue sensitivity to androgens. Infertility may be the only presenting symptom.

Acquired insulin resistance after weight gain of unknown cause may occasionally induce the clinical pictures of PCOS in a woman with previous normal ovulatory function.

# **Adolescents a vulnerable group**

- Stress
- Depression
- Food habits-overweight,obesity
- Lack of exercise
- Premature puberty

Early diagnostic signs are mistakenly dismissed as normal changes of adolescence



# **Inclusion criteria for screening**

**Checklist: Any of the following symptoms:**

- **Premature puberty**
- **Oligomenorrhea/amenorrhea** (two years after menarche)
- **Signs of hyperandrogenism:** Hirsutism, severe acne,  
male pattern alopecia
- **Signs of hyperinsulinemia :** Obesity, acanthosis nigricans
- **History of PCOS in family**

# Differential Diagnosis of PCOS

- \*Idiopathic hirsutism
- \*Hyperprolactinemia
- \*Hypothyroidism
- \*21-hydroxylase-deficient non-classical adrenal hyperplasia (late-onset congenital adrenal hyperplasia)
- \*Ovarian tumors
- \*Adrenal tumors
- \*Cushing's syndrome
- \*Glucocorticoid resistance
- \*Other rare causes of androgen excess

# Laboratory Tests for the differential Diagnosis of Androgen Excess

## Initial testing

Total testosterone

Prolactin

TSH

Further testing based on clinical presentations

17-OH-progesterone (8:00 AM) – CAH :  $>2$  ng/mL

17-OH-progesterone 60 min after iv. ACTH – CAH :  $> 10$  ng/mL

Cortisol (8:00 AM) after 1 mg dexamethasone at midnight –

Cushing's :  $> 5$  ug/dL or  $> 2$  ug/dL

DHEAS – Adrenal tumors :  $> 8$  ug/mL (but also in 50% of PCOS)

Androstenedione

Imaging of ovaries (transvaginal ultrasonography)

Imaging of adrenals (ABD echo, adrenal CT scan, adrenal MRI)

Nuclear imaging after iv. radiolabeled cholesterol

# Laboratory Tests for PCOS

## LH/FSH ratios

Elevated LH level and/or increased LH/FSH ratio are *not* required for diagnosis of PCOS.

Pulsatile nature of LH secretion give heterogeneity of LH values in PCOS.

LH levels are not increased in obese women with PCOS (LH pulse amplitude is normal in overweight, increased in nonobese women with PCOS; LH pulse frequency is increased with anovulation regardless of body fat content.) ➔ Low LH level dose not rule out PCOS !!

High LH/FSH ratio is supportive of PCOS, esp. in differentiating mild cases of non-obese women without prominent androgen excess from hypothalamic anovulation.

# therapeutic options (PCO-hirsutism)

## HIRSUTISM

### GOAL:

The prevention of further stimulation of hair growth

Cosmetic correction of the problem

# therapeutic options

## Management of excess ovarian androgen production :

1-Standard therapy is :combined E+P,most commonly OCs

It reduces ovarian androgen production

It increases SHBG

It induces competition at the cellular level for binding to the androgen receptor

# therapeutic options

2-ovarian suppression by long acting GnRh analogue

long acting GnRh analogues used

but there is doubt that this therapy will be beneficial over ocs

3-insulin sensitizing agents:

for pco with acanthosis nigricans

commonly used agent is : metformin and troglitazone, pioglitazone, rosiglitazone

# therapeutic options

## SELECTING BEST THERAPY:

Correct underlying medical problem

Correct thyroid/hyperprolactinemia

PCO :oral contraceptives

Ocs + spironolactone is usually the choice

75 –80% patients shows response

Atleast 6 months is needed for evidence of response



# therapeutic options

If response is seen in 6 months then treatment should be continued for further 6 months and in most cases for number of years

## **Surgical treatment**

Most patients resumed menses and achieved pregnancy after ovarian wedge resection (at least one half of each ovary).

Nowadays it is an old method which is changed by laparoscopic ovarian drilling

# Adolescent PCOS

- Cases first screened and diagnosed in infertility clinics
- Dermatological effects of PCOS can have deleterious effect on an adolescent's self-image and peer interaction
- Weight gain and menstrual uncertainties affect body image and lead to further stress including the family members

## **When the family should take her young female to the doctor?**

### **See your doctor if any of the following apply:**

- \*you have any of the symptoms of polycystic ovary syndrome, such as periods becoming irregular or stopping altogether
- \*you are taking any medications that might be responsible (check the information leaflet in the packet)
- \*excess hair starts to appear suddenly in adult life
- \*no one else in your family has excess hair
- \*if, at the same time, you are losing hair from your scalp, especially at the sides of your forehead
- \*you are having to spend a lot of money on electrolysis
- \*you are depressed and worried by your appearance.

## **How your doctor can help?**

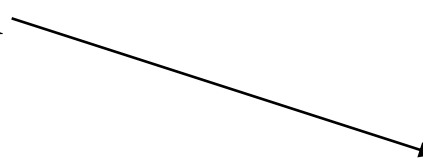
If the PCO is a possibility your doctor will refer you to an endocrinologist or gynecologist. The endo/gyne will check for other problems, such as diabetes, that can sometimes accompany polycystic ovary syndrome. The medication used to treat polycystic ovary syndrome is effective, especially if you also lose weight; greasy skin and acne clear up in about 6 weeks, but it can take 12–18 months for maximum improvement in the hirsutism (hairiness).

## **Why we should go at this young age?**

- \*Early detection can prevent future morbidities**
- \*Early diagnostic signs are mistakenly dismissed as normal changes of adolescence**
- \*To get an idea about our future fertility**
- \*To prevent many social and psychological problems**

**How** governmental and non governmental institutions can help?

Increasing public awareness most specifically young female:-

\*Ministry of education  School

\*Ministry of health 

\*Ministry of Social Affairs  women societies

# **Conclusion and recommendations**

- \* Female hormonal disorders is very common
- \*hirsutism and PCO in the young female is a serious medico social problem
- \* early action in address the problem is very important and any delay may lead to complications “diabetes, obesity, hirsutism, infertility...etc”
- \* public awareness is important in reducing the side effects of the problem

many thanks