

Objectives

The purpose of this study is to make a selection of foods that can improve fertility outcomes in women with polycystic ovary syndrome (PCOS). The target is to know syndrome endocrin alterations in order to make a list of beneficial foods knowing how they modulate the endocrine system by acting on genes, enzymes, molecules and hormones, thereby improving physical and psychological features, risks and the fertility of women who suffer from PCOS.

Introduction

The PCOS is an endocrine disorder that affects between 5 and 10 % of women of reproductive age and is one of the most common endocrine-metabolic disorders. PCOS is characterized by the presence of hirsutism, multiple cysts in the ovaries and amenorrhea, negatively affecting fertility in women. Recent studies show that diet plays an important role in the development of the syndrome; supporting that nutrients interact with the genome and modulates the molecular mechanisms involved in physiological processes in the body. With knowledge of the relationship between genes and diet, it helps one to find an optimal diet in order to improve the menstrual cycle and endocrine profile of women who suffer from PCOS.

This study examines the influence of certain foods on the regulation of most characteristic PCOS hormones; it describes what food to eat, and avoid, in order to improve the endocrine profile of women suffering from the syndrome.

The pathophysiology of PCOS

In PCOS, gonadotropin hormones do not fluctuate due to the high hypothalamic-pituitary-ovarian axis activity and high ovarian steroidogenesis.

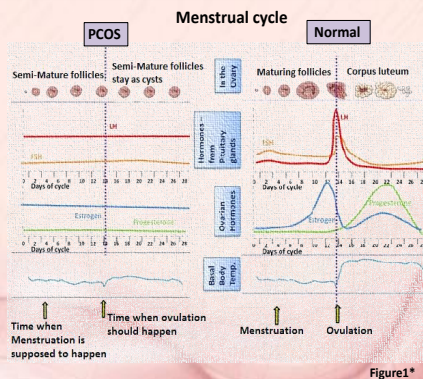
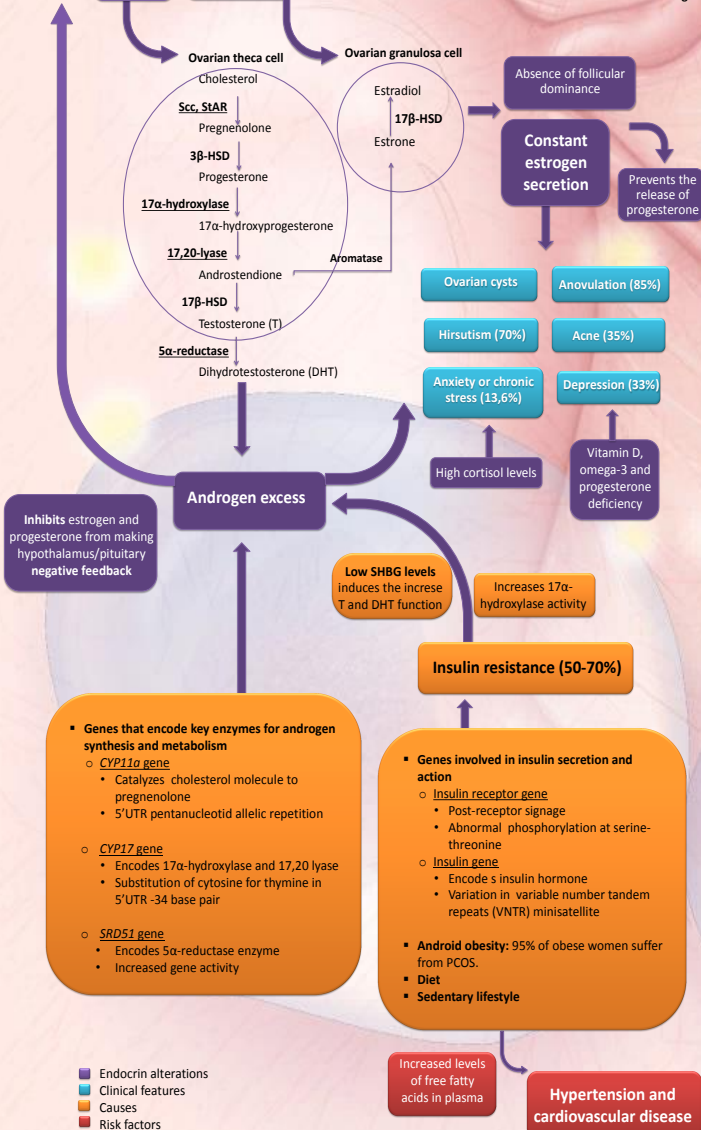


Figure 1*



Food and PCOS

Food to eat



Low glycemic index food

Buckwheat, quinoa, brown rice, oat and rye.

- Gradual increase of glucose and insulin in the blood, thus avoiding the insulin peak.
- Decrease androgen synthesis and increase SHBG levels.
- No triglyceride synthesis in liver; reducing cardiovascular disease risk.



Omega-3, polyunsaturated fatty acid (PUFA)

Bluefish (sardines, mackerel, herring and salmon), flax, nuts and seaweed.

- Omega-3 reduces liver fat and insulin resistance; reduces androgen synthesis and increases SHBG synthesis.
- Moreover, monounsaturated fatty acids improve insulin resistance, reduce LDL and increase HDL. (Food: olive oil and sunflower oil).



Mint tea, green tea and marjoram tea

- These teas are anti-androgenic; they reduce androgen excess directly.
- In addition, marjoram tea improves insulin resistance.



Vitamin D supplement or sun exposure

- Only 20 minutes of sun exposure each day is much more effective than consuming foods that are rich in Vitamin D.
- Vitamin D stimulates the production of progesterone in ovaries, improving endocrine disorder and depression.



Vegetables, fruits, seeds and herbs

- The high content of fiber reduces insulin peak.
- Inositol reduces testosterone serum and cholesterol levels, improves insulin resistance and promotes relaxation.
- Crom reduces insulin resistance.

	Banana	Apple	Citrus	Melon	Grapes	FRUITS	Broccoli	Asparagus	Tomatoe	Celery	VEGETABLES
IR	x	x	x	x	x		x	x	x	x	
A	x	x	x	x	x			x			x
SHBG											
	Walnuts	Sesame	Flax	Licorice	Cinnamon	SEEDS	Mint	Basil	Marjoram	Seaweed	HERBS
IR	x	x	x	x	x		x	x	x		
A	x	x	x	x	x		x	x	x	x	
SHBG			x								x

Table of plant food classified by the hormonal changes they perform. Food marked in "IR" improves insulin resistance, food marked in "A" reduces androgen levels; food marked with "SHBG" increases SHBG levels, and lastly, food marked with "x" means that it performs the function that relates them in the table.

Food to avoid

High glycemic index food



Dairy from cow's milk (IGF-1)



Saturated fatty acids



Conclusions

The PCOS is a multifactorial cause; not all women who suffer from the syndrome have the same symptoms, although hirsutism and menstrual irregularities are usually common. Insulin resistance is one of the causes that can aggravate more of the symptoms because insulin increases androgen production in ovarian theca cells. Thus reducing this resistance through food the endocrine system balance and fertility of women can improve. This knowledge has allowed us to find a suitable diet to increase insulin sensitivity and decrease androgen levels; a diet which includes low glycemic index foods, foods high in fiber and omega-3, vitamin D supplements and anti-androgenic functional food, and avoids high-glycemic index foods, dairy from cow's milk and saturated fatty acids. The drop in androgen levels provided by these dietary guidelines allows estrogen and progesterone to make adequate feedbacks in gonadotropin cells, normalizing hypothalamic-pituitary-ovarian axis activity, thus inducing ovulation. In addition, glucocorticoids synthesis could also be reduced, which could result in less stress and depression of women who suffer from the syndrome. Therefore, the development of polycystic ovary syndrome may be improved by an appropriate diet.

Bibliography

- *Figure1. Adapted from: PCOS Journal. <<http://www.pcosjournal.com>>
Background image. Adapted from: Ehrmann DA. Polycystic Ovary Syndrome. *N Engl J Med*. 352, 1223-1236 (2005).
"Food images" and "Table of plant food classified by the hormonal changes they perform" from Marina Colom Pellicer.
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