

Clarissa Mae L. Lee, MD
Sheryll Beltran-Carullo, MD

Baguio General Hospital and Medical Center

INTRODUCTION

Primary ovarian insufficiency is the depletion or dysfunction of ovarian follicles with cessation of menses before age 40 years. It affects 1-2% of women <40 years of age, 0.1% of women <30 years of age and is uncommon in adolescents. The clinical presentation of POI is variable however the most common symptom is primary or secondary amenorrhea. But because irregular menstrual cycles are both common during early adolescence and an initial symptom of primary ovarian insufficiency, diagnosis can be difficult in this population. Currently, there is no consensus on criteria to identify primary ovarian insufficiency in adolescents, and delay in diagnosis is common.

CASE

History

This is the case of KF, an 18-year-old, G0, who had her menarche at 12 years of age with a chief complaint of secondary amenorrhea

3 years PTC	<ul style="list-style-type: none"> •Irregular menses (1x a year, 3 days) •Pregnancy test: negative •Ultrasound: Polycystic ovary, right •Impression: Polycystic ovarian syndrome •Plan: Advised observation until 18 years
Two years PTC	<ul style="list-style-type: none"> •Still no menses •Progesterone to induce withdrawal bleeding •Ultrasound: unremarkable •RBS, FT4, TSH: normal
Four months PTC	<ul style="list-style-type: none"> •Ultrasound: Small uterus, non-visualized ovaries •Decreased Estradiol and elevated FSH

Physical Examination



Fig. 1. Underdeveloped Breasts, Tanner Stage 3



Fig. 2. Normal External Genitalia Tanner Stage 5

Diagnostics



Fig 3. Ultrasound findings of a small uterus with thin endometrium and non-visualized ovaries

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FSH	43.23 mIU/ml	43.34 mIU/ml	Increased
Estradiol	6.14 pg/ml	>5.00 pg/ml	Decreased
Prolactin		11.468 ug/L	Normal

Table 1. FSH, Estradiol and Prolactin levels

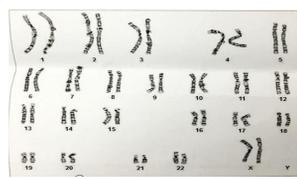


Fig. 4. Normal Female Karyotype (46, XX)

	POI	PCOS	Turner's syndrome	Hyperprolactinemia
FSH	Increased	Normal	Normal	Normal
Estradiol	Decreased	Normal	Normal	Normal
Prolactin	Normal	Normal	Normal	Increased
Secondary sex characteristics	Under developed	Developed	Under developed	Developed
Karyotype	46,XX	46,XX	45,X; 46,XX	46,XX

Table 2. Differential Diagnoses

DISCUSSION

Menopause, the permanent cessation of menses, results from the depletion of potentially functional primordial follicles. This occurs naturally at around 50 +/- 4 years and Primary Ovarian Failure is most commonly defined as menopause before the age of 40. It affects 1-2% of women younger than 40 years of age and 0.1% of women younger than 30 years of age.

Primary Ovarian Insufficiency occurs through two major mechanisms: Follicle dysfunction and Follicle depletion. Follicle dysfunction indicates that follicles remain in the ovary, but a pathologic process prevents their normal function while Follicle depletion indicates that no primordial follicles remain in the ovary. For most women, this is usually complete by about 51 years old. However, the follicle depletion may be accelerated by a number of genetic disorders and ovarian toxins. Initial laboratory evaluation for suspected cases include measurement of basal FSH (Gold standard), basal estradiol levels and tests to rule out other causes.

POI affects a woman's physical and emotional wellbeing, and the management should address both. It affects not only fertility, but also impacts on bone health, cardiovascular health and sexual function. Estrogen deficiency results in increased bone remodeling leading to a net bone loss of 2-3% per year early after menopause hence they are at risk for osteopenia and osteoporosis. Early loss of endogenous estrogen causes impaired endothelial function and increased cardiovascular morbidity and mortality. Although data in the adolescent population are lacking, vigilant monitoring is warranted. Loss of fertility is one of the key accompanying features of the diagnosis, however fertility may persist even when few functional follicles are present. Spontaneous resumption of ovarian function gives a 5-10% chance of pregnancy. Health care providers should also be aware of its potential psychological effects and should counsel on the risk of associated comorbidities.

For adolescents, the objective of treatment is to replace the hormones that the ovary would be producing before the age of menopause. In our case, she was started on Estradiol valerate, Medroxyprogesterone acetate and Calcium supplementation. Menses resumed 2 months after initiation of treatment. A baseline DEXA scan was advised to be repeated once every 5 years. Thyroid function monitoring and assessment of cardiac function was advised once every 2 years. She was also subjected to counseling and was advised annual follow up.

CONCLUSION

Primary ovarian insufficiency is a complex condition that affects many aspects of a person's general health and wellbeing. Women, especially those in the younger age group, should receive hormonal therapy to replace the hormones that the ovary should be producing in order to maintain adequate bone, cardiovascular and sexual health. Once primary ovarian insufficiency is diagnosed, patients should be evaluated at least annually and patients should maintain a healthy lifestyle, regular exercise, balanced diet and avoid smoking. In addition, health care providers should be mindful of the sensitive nature of this diagnosis and should address the special needs of this population, including counseling and psychology referrals if needed.

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