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Successful Pregnancy Following ICSI in Patient with Premature Ovarian Insufficiency

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Abstract

Objective:
As the diagnosis of premature ovarian insufficiency is usually sudden and distressful for the patient in terms of facing infertility this case report aims to provide new insights to treating infertility and improving patient outcomes and highlight the potential for new approaches to better manage POI.

Methods:
A Case Report involving Premature ovarian insufficiency patients to investigate the Signs of ovulation and Positive pregnancy testing.

Results:
Return of ovarian function and spontaneous pregnancy is possible in women with premature ovarian insufficiency when using Sandwich protocol.

Conclusion:
Pregnancy is possible in premature ovarian insufficiency after hormone replacement therapy and intra-cytoplasmic sperm injection.

Keywords: Premature ovarian insufficiency, Intracytoplasmic Sperm Injection, Assisted Reproductive Techniques, Induction Protocols.

Introduction

Premature ovarian insufficiency (POI) is a disorder in which the ovaries prematurely lose their ability to function as both reproductive and endocrine organs, typically affecting women under the age of 40 (1). This condition results in a reduced ovarian reserve and insufficient production of ovarian hormones, resulting in early onset of menopause (2). POI is linked to infertility due to hypoestrogenism which leads to pregnancy failure and symptoms like hot flushes, night sweats and sleep disturbances (3).

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Case Report

Premature ovarian insufficiency (POI) is a clinically significant condition that affects a considerable proportion of women. Its estimated incidence rate ratio that varies with age; the ratio being 1:100 cases by the age of 40 years, 1:250 cases at the age of 35 years, 1:1000 cases by 30 years, and 1:10000 cases during the age of 18-25 (4). The term premature ovarian insufficiency replaced previous misnomer premature ovarian failure to better refer to the fact that some patients are known to have residual ovarian function that seldom leads to pregnancy.

Premature ovarian insufficiency is diagnosed when a woman has elevated serum levels of pituitary gonadotropin follicle-stimulating hormone (FSH) with low levels of estradiol (E2). A diagnosis of POI is reached when serum levels of FSH and E2 are measured on at least two separate occasions with more than 4 weeks of interval, and patients that present with continuously elevated FSH levels (greater than 25 mIU/ml) are diagnosed with POI (5) The etiology of POI is multifactorial, involving a complex interplay of genetic, environmental, and autoimmune factors. Autoimmune disorders, like autoimmune thyroid disease and Addison's disease, have also been shown to contribute to the onset of POI, as they may trigger an immune-mediated attack on ovarian tissue (6). While certain genetic mutations, such as those affecting the X chromosome or autosomal genes like FMR1, have been implicated in the pathogenesis of POI, many cases remain idiopathic.

To previously healthy young women, premature ovarian insufficiency is a devastating and sudden diagnosis suggestive of permanent sterility, early onset of hypo-estrogenism and holds the stigma of menopause label. Many patients with POI find it difficult to accept their loss of fertility and will seek infertility treatment despite being counselled about their low chances of success. This case study seeks to provide insight into improving patient outcomes and highlight the potential for new approaches to better manage POI.

Case Study

A 26 year old medically free woman consulted at infertility clinic with six years primary infertility and one unsuccessful trial of simple induction with Clomifine citrate. Her cycle was irregular since menarche with average flow and some episodes of hot flushes and decreased libido. She reported no family history of POI , no personal history of autoimmune disease, no chemotherapy nor radiotherapy nor did she have any pelvic surgeries.

Her hormonal profile on first visit was FSH: 75 mIU/ml E2: 5 mIU/ml, a repetition of labs was requested. Second hormonal assay was: FSH: 65.8 mIU/ml, LH: 42 mIU/ml, E2: 0.78 mIU/ml, PRL: 32 mIU/ml, AMH: 0.43 ng/ml TSH: 1 mIU/ml Vitamin D 65.8 mIU/ml.

Trans-vaginal ultrasonography on day 11 of her cycle showdnormal size antroverted uterus with thin endometrial lining and both ovaries small in size and volume with low AFC and no mature follicle in either ovary. HSG showed normal size uterus in position, no filling defect and minimal spillage on both sides suggestive of patent bilateral fallopian tubes. Repeated laboratory results confirmed diagnosis of POI. Patient was started on HRT and cabergoline, which are clinically proved to suppress prolactin, LH, and FSH levels, may improve follicle function and increase chance of ovulation.

To attempt pregnancy she elected a trial of ICSI in conjugation with follicle monitoring and physiological HRT. Her baseline investigations on day 2 of menstruation were FSH: 3.7 mIU/ml. ,LH: 4.6 mIU/ml, P4: 0.7 mIU/ml, E2: 107 mIU/ml, PRL: 8 mIU/ml. Husband's semen parameters were normal. Patient was started on sandwich protocol for 11 days with close folliculometry and E2 level monitoring. GnRH antagonist was administered (0.25 mg/d) on days 1,2 and 3 and then stopped and was readministered when the leading follicles reached 13 and 14 mm in diameter. GnRH was continued until hCG day. Patient was also on Follitropin alpha injections from day 4 to day 11 , doubling the dose the last two days.

Supplementary Co-Q10 was also prescribed and E2 level reached 1960 on day of trigger and 10 oocytes were collected during oocyte retrieval under general anesthesia. After denudation the oocytes were graded as 2 MII , 7 MI and 1 GV. All 9 oocytes were injected, four embryos formed. One blastocyst was transferred and two were cryopreserved. Patient was put on supportive therapy for two weeks and BHCG test was 129 mIU/ml. The patient consented to the publication of her case and personal medical information.

Discussion

While normal menopause is not reversible, POI is characterized by intermittent ovarian function and spontaneous ovulation was observed in 20-24% and conception happens in 5% of women (7). Patients with POI have low chances of spontaneous conception with a mere 5% chance mostly during HRT treatments (8). Since pregnancy is uncommon

in this population, egg donation is often the chosen solution for the majority of cases.
To date, no clinical test can determine the potential for conception in POI patients. As a result, it may be clinically prudent not to be too premature in diagnosing absolute infertility in this population particularly if the woman is under 30 years of age.

Conclusion

This case report offers hope for the development of more effective treatment strategies, including options for fertility preservation and hormonal therapy. Despite these advances, significant gaps remain in our understanding of POI.

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