

Premature Secondary Amenorrhoea among Sudanese Women

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Abstract

Premature secondary amenorrhoea is a fertility problem for women at the childbearing age. It is a challenge to the couple and to their treating physicians. Psychologically the amenorrhoeic woman is upset by the absence of both the pregnancy and the menses. The aim of this study is to measure the gonadotrophic hormones FSH and LH and relate them to premature secondary amenorrhea in the study sample. One hundred under 40-year old amenorrhea women at the childbearing age attending specialized gynaecological clinics were enrolled in the study. Demographic data were collected and blood specimens were collected for relevant hormonal assay (FSH, LH, Prolactin and FSH). The results of 17 participants were invalidated and the study pursued with the results of the 83 participants. The hormonal profiles confirmed the diagnosis of premature ovarian failure in 55 participants and polycystic ovary syndrome in the remaining 28 participants. TSH and prolactin were found to be of no significance to the premature secondary amenorrhea in the study sample. It results from different causes but premature ovarian failure and polycystic ovary syndrome are recognized causes. These diseases are reflected in the laboratory investigations as derangement in gonadotrophic hormones mainly FSH and LH. As conclusion, it was found that the commonest causes of premature secondary amenorrhoea were ovarian failure and polycystic ovary syndrome. Most of the women with such amenorrhoea were found to have late menarche and did not become pregnant. Moreover, the gonadotrophic hormone derangement was found to be consistent with the reported findings in the medical literature.

Keywords: Secondary amenorrhoea, premature ovarian failure, polycystic ovary

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Introduction

Premature secondary amenorrhoea is defined as the cessation of menses after menarche and before menopause for at least three months in a woman with regular menses or for six months in case of irregular menses¹. The most important cause of such a condition is pregnancy². Moreover it can occur after pregnancy during breast feeding and these are called physiological secondary amenorrhea². Different conditions may lead to this type of amenorrhea such as severe stress, obesity, exertional sports³. Hormonal causes whether pathological or iatrogenic may result in amenorrhea⁴. Two of the most important causes of amenorrhea are the premature ovarian failure (OF) and the polycystic ovary syndromes (PCO)⁴. Premature ovarian failure refers to a loss of normal function of ovaries before the age of 40 years⁵. Although the exact cause of premature ovarian failure is unknown, a genetic factor and autoimmune disease are considered as important causes in some women⁶. Moreover, it may occur as a result of surgical operations such as hysterectomy, other pelvic surgery, radiation or chemotherapy⁶. In this disease some hormonal abnormalities are found such as elevated pituitary hormones mainly follicle stimulating hormone (FSH) and luteinizing hormone (LH) but prolactin level may be normal⁷. The other condition that leads to premenopausal amenorrhea is the polycystic ovary syndrome⁸. It encompasses a syndrome of polycystic ovaries, in association with systemic symptoms causing reproductive, metabolic and psychological disturbances^{6,7}. These most commonly present with infertility, amenorrhoea, acne or hirsutism and its cause remains unclear⁸. Polycystic ovaries develop when ovaries are stimulated to produce excessive amounts of male hormones, particularly testosterone. This stimulation is caused by excess LH produced by the anterior pituitary in response to increased gonadotrophin-releasing hormone (GnRH) pulsatility, or through high levels of insulin caused by insulin resistance^{8,9}. High insulin levels also suppress hepatic production of sex hormone-binding globulin (SHBG) leading to higher levels of free circulating androgens, further adding to the hyperandrogenaemia^{4,8,9}. Hyperinsulinaemia goes on to cause dyslipidaemia⁸. The condition appears to be familial, but the gene involved and mode of inheritance have not yet been identified⁹. The level of LH is increased and the LH: FSH ratio is increased (>2)^{8,9}.

Rationale

The specialized gynaecological and fertility services become more available and the clients become more aware of the benefit of these services. As a result, many amenorrhoeic women at childbearing age seek these medical services. Laboratory investigations become part and parcel of the management of these patients. Gonadotrophic hormonal assay is commonly requested to help in diagnosis and treatment.

Study Design

It was a descriptive and the sampling was non-probability consecutive one.

Study Population

The study population was composed of the under 40-year old non-pregnant women presenting with secondary amenorrhoea to the Nile Fertility Centre in Khartoum and the gynaecological clinic in Al-Rahad Hospital (North Kordofan).

Study Sample

One hundred participants out of the population were enrolled in the study once they became available to researcher.

Specimens Collection and Analysis

After informed consent, five millilitres of blood were collected by venepuncture from each participant. The blood specimens were left at room temperature to clot and sera were harvested after centrifugation of the clotted blood. Hormonal for serum FSH, LH, PRL and TSH assay was done by the Automated Enzyme Immunoassay Machine.

Results

The study enrolled 100 participants with age range between 23 and 40 years and the mean age of the participant was 33 years. Seventy of them were from the Nile Fertility Centre in Khartoum and 30 from Al-Rahad Hospital in North Kordofan. Eighty three of the serum specimens gave valid results while the results of 17 specimens were invalid. Regarding the 83 participants with valid results, 27 (32.5%) were in the age range of 20-29 and 56 (67.5%) in the age range of 30-40 years (table 1). The vast majority of them reached menarche at age of 17 (28 =33.7%) and 18 years (34 =41.0% table 2). The majority (42 =50.6%) had amenorrhoea for six months (table 3). Twenty six (31.3%) of them became pregnant at least once while the remaining 57 (68.7%) did not become pregnant at all (table 4). Regarding the 83 participants with valid results, 55 (66.3%) of them had hormonal results that confirmed the diagnosis of premature ovarian failure and 28 (33.7%) confirmed the diagnosis of polycystic ovary syndrome (table 5 & 6). All the 55 participants with premature ovarian failure had high FSH, while 52 of them had high LH and three had normal LH. Regarding the prolactin level, 48 of them had normal level, six with high level and one with low level (table 5). In case of the 28 participants with polycystic ovary syndrome, 22 had normal FSH and two with high levels. Fifteen of them had high level of LH and 13 with normal level. Four participants had high prolactin level, 22 normal and one low (table 6). LH/FSH ratios of more than two was found in 25 participants of PCO and the remaining three had ratios of less than two (table 7).

Table 1: Age groups

Age group in years	No. of amenorrhoeic women
20-29	27 (32.5%)
30-40	56 (67.5%)
Total	83 (100.0%)

Table 2: Distribution of amenorrhea women according to menarche age

Menarche age in years	No. of Amenorrhoeic women
15	2 (2.4%)
16	3 (3.6%)
17	28 (33.7%)
18	34 (41.0%)
19	12 (14.5%)
20	4 (4.8%)
Total	83 (100.0%)

Table 3: Distribution of amenorrhoeic women according to duration of amenorrhoea

Duration of amenorrhoea in month	No. of amenorrhoeic women
6	42 (50.6%)
12	32 (38.6%)
>12	9 (10.8%)
Total	83 (100.0%)

Table 4: Distribution of amenorrhoeic women according to previous pregnancy

Previous Pregnancy	No. of amenorrhoeic women
Yes	26 (31.3%)
No	57 (68.7%)
Total	83 (100.0%)

Table 5: Hormonal assay of the sera of women with Premature Ovarian Failure Results

Hormone		No. of women with Premature ovarian failure (n=55)	Percentage
FSH	High	55	66.3
	Normal	0	0.0
	Low	0	0.0
LH	High	52	62.7
	Normal	3	3.6
	Low	0	0.0
Prolactin	High	6	10.9
	Normal	48	87.3
	Low	1	0.0
TSH	high	1	1.8
	normal	50	90.9
	Low	4	7.3

Table (6) shows results of hormonal assay of the sera of women with PCO

Hormone	Hormone level	No. of women with PCO (n=28)	Percentage
FSH	high	2	2.4
	normal	26	31.3
	Low	0	0.0
LH	high	15	18.1
	normal	13	15.7
	Low	0	0.0
Prolactin	high	4	14.3
	normal	22	78.5
	Low	2	7.2
TSH	high	0	0.0
	normal	27	96.4
	Low	1	3.6

Table 7: LH/FSH ratio among amenorrhoeic women with PCO

LH/FSH ratio	No. of women with polycystic ovary
Ratio = 2 or more	25 (89.3%)
Ratio < 2	3 (10.7%)
Total	28 (100%)

Discussion

Premature secondary amenorrhoea is a fertility problem for women at the childbearing age. It is a challenge to the couple and to their treating physicians. Psychologically the amenorrhoeic woman is upset by the absence of both the pregnancy and the menses. All the amenorrhoeic women came to the hospitals for treatment and most of them (57 =68.7%) did not become pregnant; which was a compelling need to seek medical help in the Sudanese community that put traditionally the responsibility of infertility on the woman. Seventy eight (94%) of the amenorrhoeic women had late menarche if the data they gave were reliable (table 2). It is not clear whether premature amenorrhoea is associated with late menarche or not in normal women. However it has been reported among athletic women¹⁰. It is not clear whether the women in this study were doing exhausting work of any sort as in some Sudanese communities that amounted to athletic exercise; a point that needs more clarification. The third decade seems to be a risk factor for premature secondary amenorrhoea because most (67.5%) of the amenorrhoeic women (table 4) were in the age range between 30-40 years which coincides with other reports¹¹. Most of the women had amenorrhoea for about six months (table 3) this is probably due to early presentation to medical services because of the increased awareness and the availability of the gynaecological services.

The majority (66.3%) of the participants fulfilled the hormonal criteria of premature ovarian failure by having high FSH and LH levels. This disease results from disappearance of follicles from the ovary and the diagnosis can be established by demonstrating elevated gonadotrophin levels and the low levels of gonadal hormones (estrogens and inhibins). Premature ovarian failure (POF) is the occurrence of hypergonadotropic hypoestrogenic amenorrhea in women under the age of forty years⁷. In this study all the 55 amenorrhoeic women had high FSH and 52 (94.5%) of them had high LH. This is consistent with the definition of POF⁵. It is a heterogeneous disorder affecting approximately 1% of women <40 years of age. It has been reported that the elevation of FSH is usually more marked than that of LH and an FSH value >30 U/L is indicative of ovarian failure⁷. Twenty eight of the amenorrhoeic women were diagnosed as having polycystic ovary syndrome. The LH/FSH ratio was more than two in 25 of them whether the levels of the hormones were normal or high. This finding is consistent with the diagnosis of PCO^{10,12}. However, the ratio as a concrete diagnosis for PCO has been refuted in some research reports⁹. They had normal prolactin and TSH levels. This finding is consistent with other reports¹². Premature ovarian failures followed by polycystic ovary syndrome were the commonest two causes of premature amenorrhoea in our study sample. We recommend that more emphasis is to be put on these two conditions when a woman with premature secondary amenorrhoea presents to the gynaecological clinic and more studies are needed in this field.

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