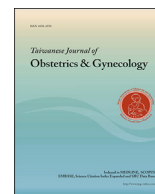




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Original Article

Diminished ovarian reserve in patients with psoriasis

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ABSTRACT

Objective: Psoriasis is a multi-systemic chronic inflammatory skin disease. Previous data suggests that women with some chronic inflammatory diseases have diminished ovarian reserve. This study explores ovarian reserve in patients with psoriasis.

Materials and methods: We prospectively analyzed 14 female patients with psoriasis and 35 healthy age and body mass index matched controls. An interview explored demographic characteristics, obstetrical history and menstrual characteristics. Psoriatic area severity index (PASI) in patients was assessed. Estrogen, follicle-stimulating hormone (FSH), luteinizing hormone (LH), thyroid stimulating hormone and with gynecologic ultrasonography, ovarian volume and antral follicular count (AFC) were measured in both study and control groups. These values were analyzed with changes of the PASI in the patient group.

Results: Patients with psoriasis had significantly higher levels of FSH and FSH/LH ratio than healthy controls ($p = 0.039$, $p = 0.005$ respectively). AFC of psoriasis patients were significantly lower than healthy controls ($p = 0.002$). There were no significant difference among other hormone levels and ovarian volumes ($p > 0.05$). The hormone levels, ovarian volume and AFC were not correlated with PASI of the patients.

Conclusion: The results of the study suggest that patients with psoriasis may have diminished ovarian reserve.

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Introduction

Psoriasis is a complex, chronic relapsing skin disease. Among the psoriasis patients, about 50% are female, whereas the majority of them have onset of the disease in childbearing years [1,2].

The disease of psoriasis is characterized by an immunomediated inflammatory process that affects the skin and joints but leads to systemic inflammatory conditions and contributes to pathological mechanisms of other chronic inflammatory diseases [2,3].

Current evidence suggests that women with chronic inflammatory diseases like systemic lupus erythematosus (SLE) and primary antiphospholipid syndrome (PAPS) have diminished ovarian reserve [4–6].

Ovarian reserve (OR) provides an indirect estimate of a reproductive aged woman's remaining follicular pool. A spectrum of markers to detect the ovarian reserve consists of basal follicle stimulating hormone (FSH), estrogen (E2), FSH/luteinizing hormone (LH) ratio, Inhibin B, antimullerian hormone (AMH). Ovarian morphometric markers include ovarian volume (OV) and antral follicle count (AFC). However, the availability of multiple ovarian reserve markers suggests that none is ideal and age is known to be the most important factor in determining the fertility potential of a regularly cycling women [7].

Accumulating data suggests that the female hormonal status during pregnancy, has an affect on the course of psoriasis and in contrast psoriasis has an impact on pregnancy outcomes. Despite the data relating psoriasis with pregnancy, ovarian reserve and functions have not been studied yet in psoriatic patients [2,8–10].

Therefore, our primary objective was to assess ovarian reserve tests in reproductive aged psoriatic women without previous systemic treatment and in age-matched, healthy females to determine whether the ovarian reserve is reduced. Secondly, we aimed to

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determine whether the severity of disease correlates with ovarian reserve or not. Furthermore, we analyzed the association of psoriasis with the number of births and miscarriages, and with the menstrual cycle regularity.

Materials and methods

In this prospective analytic case–control study, we included 14 female patients with psoriasis and 35 age and body mass index (BMI) matched women as healthy controls who are all in reproductive age. The study was performed between January and September 2014 in Aksaray University Research and Training hospital. The protocol of the study was designed in accordance with the Helsinki declaration and implemented after receiving approval from the local ethics community. After written consent was obtained, patients and controls were screened for eligibility.

Healthy controls were selected from the routine gynecological examined women without any complaint. Eligibility criteria for patients selection were determined by a dermatologist based on clinical findings and histopathological studies. The following data of the patients were documented: type of psoriasis, presence of hair and nail psoriasis, the severity of the disease using psoriatic area severity index (PASI) which was conducted by a dermatologist. Participants that were enrolled in the study, were also questioned for demographic characteristics, confounding morbidities, obstetrical and gynecological history, such as pattern of menstrual cycle and age of menarche.

The exclusion criteria for both groups includes infertility, pregnancy, the presence of gynecological pathologies, polycystic ovarian syndrome (PCOS), breastfeeding, history of gynecological surgery, chronic renal or liver failure, smoking, malignancy or other dermatologic, inflammatory, physical and psychiatric disorders. Patients who had ever received any systemic treatment and hormone medication were also excluded to avoid possible affects on ovarian function.

To assess ovarian function tests, venous blood sampling was performed from all participants in the early follicular phase (days 2–4) of the menstrual cycle at approximately 9:00 a.m. Levels of early follicular phase hormones; E2, FSH, LH and thyroid stimulating hormone (TSH) were assayed from the samples. Serum levels of FSH, LH, E2 and TSH were measured with electrochemiluminescence assay (Elecys 2010, Hitachi/Roche Diagnostic). Following the blood collection, each patients were also evaluated by a gynecologist to determine ovarian volume and total antral follicles measuring 2–10 mm in diameter were measured by transvaginal ultrasonography. Clinical data of each participant were kept as blinded to avoid any possible bias. The measurements were conducted using a high resolution ultrasound machine (Logic Q7, General Electric, USA) with a 7.5 MHz mechanical sector transducer. PASI score of each participant of study group were assessed, in the same day with gynecological investigation.

Mann Whitney U test were used to analyze the collected data from independent samples. To determine correlation between variables, Spearman test was used. Numerical variables were presented as median interquartile range (IQR). The level of statistical difference was $p < 0.05$. The power of the analysis was 87%. All analyses were performed with the Statistical Package for the Social Sciences, version 20.0 (SPSS, Chicago, IL, USA).

Results

Among the 14 patients with psoriasis, 9 had plaque type, 3 had guttat type and 2 had palmoplantar type psoriasis and in contrast none of them had psoriatic arthritis. Patients who had disease duration less than one year were only confined to 14.3 percent. The

Table 1
Psoriasis types and disease duration of the patients.

	N	Percent
Plaque type	9	64,28
Guttat type	3	21,42
Palmoplantar type	2	14,28
Patients with nail psoriasis	3	21,42
Patients with scalp psoriasis	11	78,57
Disease duration more than one year	12	85,7

distribution of types and features among psoriasis patients are shown in Table 1.

Median age of the psoriasis group was 31 (13.5) years (range 16–48 years) with a median BMI of 27.39 (10.5) (range 19.37–36.75) kg/m². There was no statistically significant difference between groups in terms of age and BMI. The median age of menarche was 13 (2) in psoriasis patients same as in the control group. Also gravidity, parity and miscarriage numbers of groups were statistically analyzed. A summary of demographic characteristics and obstetrical history of each group is showed in Table 2.

Patients with psoriasis had significantly higher levels of FSH than healthy controls (6.76 (1.96); 5.71 (2.24) respectively, $p < 0.05$). AFC of psoriasis patients were significantly lower than healthy controls (5 (2.5); 7 (4.5) respectively, $p < 0.05$). FSH/LH ratio was significantly higher in patients with psoriasis than healthy controls (1.52 (0.86); 0.92 (0.54) respectively, $p < 0.05$). There were no significant differences among other hormone levels, ovarian and uterus volumes ($p > 0.05$) (Table 2).

Median value of the PASI was 4.69 (5.9) with a range 2–19.8. According to the Spearman's rho test, there was no correlation

Table 2
Demographic, hormonal, and ultrasonographic parameters of the groups.

	Patients (N:14)	Healthy controls (N:35)	p
Median (IQR) age, years	31 (13,5), range 16–48	29 (10), range 17–43	0,535
BMI (kg/m ²)	27,39 (10,50)	24,24 (6,33)	0,150
Median (IQR) age at menarche, years	13 (2)	13 (2)	0,731
Gravidity	2 (3)	2 (3)	0,568
Parity	1,5 (2)	1 (3)	0,982
Spontaneous abortions, n (%)	5 (35,7%)	4 (11,5%)	0,050
Menstrual irregularity, n (%)	0 (0%)	4 (8,2%)	0,312
TSH (mIU/L)	2,67 (1,38)	2,32 (1,18)	0,140
FSH (mIU/mL)	6,76 (1,96)	5,71 (2,24)	0,039
LH (mIU/mL)	4,74 (3,53)	5,73 (3,46)	0,475
FSH/LH	1,52 (0,86)	0,92 (0,54)	0,005
E2 (pg/mL)	27,58 (18,16)	34 (27,31)	0,143
Total AFC	5 (2,5)	7 (4,5)	0,002
Total OV (cm ³)	10,92 (5,22)	11,66 (8,26)	1000

BMI, body mass index; TSH, thyroid stimulating hormone; FSH, follicle-stimulating hormone; LH, luteinizing hormone; E2, estradiol; AFC, antral follicle count; OV, ovarian volume; IQR, interquartile range.

P-values numbers marked in bold indicate numbers that are significant on the 95% confidence limit.

Table 3
Correlation of psoriatic area severity index (PASI) with ovarian reserve tests in patients with psoriasis (FSH, follicle-stimulating hormone; (LH), luteinizing hormone; E2, estradiol; AFC, antral follicle count; OV, ovarian volume; IQR:interquartile range).

	E2	FSH	LH	FSH/LH	AFC	OV
PASI median (IQR:4,65(5,9) (range 2–19,8)	Correlation coefficient	–,011	,108	–,178	0,402	–,238
	p value	,970	,714	,543	0,154	,412
	N	14	14	14	14	14

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