BIOCHEMICAL OUTCOMES AND ULTRASONIC FINDINGS IN POLYCYSTIC OVARY SYNDROME IN THE PROVINCE OF KHYBER PAKHTUNKHWA

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Abstract

Objective: Objectives: To determine biochemical parameters, pattern of menstrual cycle and ultrasonic findings of ovaries in patients with polycystic ovary syndrome.

Materials & Methods: It was a cross sectional descriptive study. This study was conducted in tertiary care hospitals of Khyber Pakhtunkhwa in 6 months. The study comprised of 125 subjects of newly diagnosed cases of polycystic ovary syndrome (PCOS).

Results: The study results showed that patients with polycystic ovary syndrome had higher than the normal LH, FSH, and androgens including testosterone and DHEAS. The ultrasound findings of the study subjects showed numerous cysts of varying sizes in one or both ovaries leading to highly irregular menstrual pattern.

Conclusion: The present study showed the presence of hormonal irregularities along with abnormal ovarian morphology in patients with polycystic ovarian syndrome. These findings were also related with menstrual irregularities.

Keywords: Menstrual Cycle, Polycystic Ovary Syndrome, Testosterone, Dehydroepiandrosterone Sulphate (DHEAS)

INTRODUCTION

Polycystic ovary syndrome is a very common condition in women of childbearing age and it is described as a set of symptoms including amenorrhea or oligomenorrhea, hirsutism and weight gain. It is initiated by derangements in female reproductive hormones FSH and LH, affecting the ovaries which are small organs that store and mature a woman’s ova.1-3

Ovulation happens when a mature egg is released from an ovary every month. If male sperm is available it gets fertilized. If not fertilized, it is sent out of the body during menstrual period. In normal conditions the LH and FSH is secreted in a ratio of 1:1. LH and FSH cause the maturation and release of an egg during menstrual cycle. In PCOS, LH/FSH ratio is changed to 2:1 which disturbs the maturation and the release of an egg, so the egg never matures and therefore ovulation never occurs leading to an abnormal cycle.4

In PCOS, there is more than normal gonadotropin releasing hormone (GnRH) secretion by hypothalamus, which acts on pituitary gland and interferes with the secretion of LH and FSH disturbing the normal function of ovaries. Instead of single follicle

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maturation, a number of small follicles are formed with fluid-filled sacs are called cysts.5 The cysts are seen with ultrasound and described as a string of beads. These cysts secrete male hormones called androgens. In normal conditions, androgens are present in a very small amounts but its synthesis in PCOS increases, resulting in a rise of free androgens. When androgens increase, it directly acts on pancreas to secrete more insulin resulting in hyperinsulinemia, which further worsen the condition.6

Women with the characteristic syndrome have raised levels of androgens, which is the hallmark of PCOS. The raised androgen production in PCOS is because of a number of factors or reasons: (i) small multiple cysts of ovaries cause the production of androgens like DHEAS (ii) the adrenal glands secrete increased amounts of dehydroepiandrosterone (DHEA) and Dehydroepiandrosterone sulphate (DHEAS) which are the main precursors of adrenal androgens (iii) The decreased levels of albumin and SHBG further increase the pool of free androgens like testosterone.7,8

MATERIALS AND METHODS

This was a comparative descriptive study having cross sectional design. This study was conducted in gynae outpatient department (OPD) of hospitals namely, Khyber Teaching Hospital (KTH), Hayatabad Medical Complex (HMC) and Lady Reading Hospital (LRH). The study was approved by ethical committee of the institute.

A total of 125 newly diagnosed cases of PCOS were included in the study. Known cases of PCOS who were on treatment for PCOS were excluded from the study.

The patients were informed about the study and a well informed consent was signed from them. Demographic data including name, age, religion, marital status, and address were noted. Also information regarding complete menstrual history, obstetrical history was noted. Physical examination of the patients was carried out in which blood pressure and anthropometric indices of obesity were recorded. Clinical evidence of hyperandrogenism including (acne, skin pigmentation and hirsutism) was checked. Pelvic ultrasound of all the study subjects was obtained and recorded in a well-developed questionnaire. A total of 5ml blood was collected from all the study subjects, serum of the blood was separated in eppendorf tubes and was tested for LH, FSH, testosterone, and DHEAS.

All the data collected from the study subjects was analyzed and expressed as mean and standard deviation (SD) using SPSS (statistical package for social sciences) version 20.

RESULTS

Ultrasound of 125 cases of PCOS (figure 1) clearly showed that either single or both the ovaries were affected. About 101 (80%) patients had unilateral poly cystic ovary while in 24 (19%) females’ ultrasound findings revealed bilateral polycystic ovaries.

Table 1 shows the description of menstrual cycle in cases. It can be seen that highest percentage of cases 68% had irregular menstrual cycle followed by 19 % of those who had irregular and painful menstrual cycles. A total of 8.8% of cases had irregular and scanty flow followed by 1.6% of those having regular and painful cycle. 0.8 percent of the cases had irregular short cycles and irregular heavy cycles, respectively.

Table 2 shows the description of biochemical parameters of PCOS cases. Mean LH was 16.19±6.2 (ranged from 0.09 to 35.01), FSH was 4.92 ±2.19 (ranged from 1.20 to 13.78), Testosterone was 1.69±0.86 (ranged from 0.45 to 3.21), DHEAS was 3.35 ±1.26 (ranged from 0.09 to 6.56).

DISCUSSION

PCOS is a common endocrine condition of varied etiology. It affects women of reproductive
age and commonly results in infertility and weight gain.\textsuperscript{7,10,11} In PCOS, common clinical features include menstrual irregularities, hirsutism and acne which may end up in a serious clinical conditions like type II diabetes and endometrial carcinoma.\textsuperscript{12} It is seen that early the diagnosis is made the more likely it is to avoid serious complications in PCOS.

In the present study, the menstrual irregularities were recorded in PCOS. Not even a single woman’s menstrual flow was normal. About 68 % of females were having oligomenorrhea, which is the most common feature of PCOS. The same result was obtained in a study conducted by Alnakash et al, who stated that out of 107 females, 29 of them had oligomenorrhea, and others had irregular menses.\textsuperscript{13}

PCOS are diagnosed by presence of multiple cysts in ovaries on ultrasound along with menstrual irregularities and hyperandrogenism. In the present study out of 125 cases, 101 had got polycystic ovarian findings in one ovary and 24 females had multiple cysts in both the ovaries. These findings are in agreement with the study results of Michelmore et al, who showed that women with sonographic evidence of PCO had a greater occurrence of irregular menstrual cycles than those with normal ovaries.\textsuperscript{14} Several studies have proposed that the basic problem in PCOS starts when there is hypothalamic-pituitary aberration resulting in disturbed LH to FSH ratio. In PCOS, LH: FSH ratio is perceived to be 1:2 or 1:3 instead of the normal 1:1.\textsuperscript{15} Same findings were observed in the present study. Mean LH was 16.19±6.2 (ranged from 0.09 to 35.01), FSH was 4.92 ±2.19 (ranged from 1.20 to 13.78) of 125 cases of PCOS. These results are in agreement with the findings of a study conducted by Metawie et al, who stated that LH and FSH levels were markedly deranged in PCOS females.\textsuperscript{16} In PCOS the main pathology is androgen excess. In our study the same was observed. Both serum DHEAS and testosterone levels were highly raised. The mean serum testosterone level in cases was 1.69 and the mean serum DHEAS level in cases was 3.35. The same was reported in a study conducted by Vural B et al, that the serum testosterone and serum DHEAS were significantly raised in cases than controls.\textsuperscript{17}

**CONCLUSION**

It is concluded in our study that regardless of the intricacy of the pathophysiological connections and the diversity of the anatomical and clinical manifestation of PCOS, the assessment of ovarian morphology by ultrasound seems to provide an insight into the pathological status and the degree of advancement of the disease.

**REFERENCES**


