COMPARISON BETWEEN PCOS AND NON-PCOS WOMEN REGARDING FOLLICULAR FLUID IL-10, IL-12, IL-17A AND IL-23 LEVELS

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ABSTRACT

This study was conducted on the patients attended special private clinics for the treatment of infertility in Baghdad city for the period from the end of July 2015 until the end of September 2016 for estimation of interleukin (IL)-10, IL-12, IL-17A and IL-23 in in the follicular fluid of “polycystic ovary syndrome (PCOS)” women. The study included 55 women with polycystic ovary syndrome and 35 healthy women. The follicular fluid was collected from the patients and the control group during the ovulation period, i.e. 12-14 days of the menstrual cycle, 3 ml of follicular fluid were collected by physician and then kept in the refrigerator freezing until for estimation of level of interleukin -10, IL-12, IL-17A and IL-23 in in the follicular fluid of “PCOS women” by using ELISA technique (Quantikine Co. USA). The current study showed that most PCOS, who reached the age of twenty to twenty-nine years and 60% of them and excess weight. All polycystic ovarian women were all affected by the appearance of hair in the bodies here (hirsutism). Study also showed that 65.45% of PCOS cases were suffering from the appearance of acne in their skin and majority of cases were with irregular menstrual cycle and positive family history of the syndrome and 74.55% were with alopecia”. “The study demonstrated that IL-10 was significantly elevated in PCOS women” (P. value 0.0004) “as compared with healthy women” (33.8±3.71 vs. 17.5±2.84 pg/ml)”. “The study demonstrated that IL-12 was significantly reduced in PCOS women” (P. value 0.0012) “as compared with healthy women” (1.26±0.02 vs. 3.09±0.011 pg/ml)”. “The study demonstrated that IL-17A was significantly elevated in PCOS women” (P. value 0.001) “as compared with healthy women” (22.8±4.78 vs. 16.9±3.19 pg/ml)”.”The study demonstrated that IL-23 was significantly decreased in follicular fluid of PCOS women” (P. value 0.008) “as compared with healthy women” (7.19±1.71 vs. 13.71±1.92 pg/ml). It was concluded that IL-10 and IL-17A were elevated in PCOS women while IL-12 and IL-23 were reduced as compared with control group.

Keywords: IL-10, IL-12, IL-17A, IL-23, PCOS, Follicular fluid

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INTRODUCTION

Polycystic ovary disease is one of the most important diseases affecting women in different ages of fertilization. This leads to signs and symptoms such as irregular menstrual cycle as well as irregular in the secretion of hormones, including the androgen, which is called the male hormone also lead to irregular menstrual cycle as well as increase LH in PCOS women. The follicular fluid is one of the most important fluid that is characterized by parallel to the same components of the serum constituents of the woman's body
Therefore, FF is necessary for maturation and development of ova and to receive intact sperm in fallopian tube to improve success meeting. During follicular advancement, follicular liquid likewise fills in as a mode for correspondence among oocyte and follicular cells. Follicular liquid piece may mirror any adjustments in the secretory procedures of the ovarian cells and changes in the plasma constituents because of neurotic conditions. Proteome examinations of follicular liquid under different ovarian variations from the norm have given some data on ovarian pathophysiology hidden these scatters. Specialists have shown that a few interleukins (IL), to be specific IL-1, IL-2, IL-6, IL-8, IL-11, and leukemia inhibitory factor created by immunocompetent cells in vitro, hinder steroidogenesis and are, thus, restrained by the granulosa luteal cells. Additionally, IL-1, IL-2, IL-6, and different cytokines have been appeared to assume a significant job in ovulation and corpus luteum work. IL-17A has been progressively demonstrated to be related with immune system issue, irritation, tumors and the host's resistance components against bacterial and parasitic contamination. IL-17A assumes its key jobs by actuating the statement of qualities encoding for professional incendiary cytokines, chemokines, antimicrobial peptides and lattice metalloproteinases, initiating a strong fiery reaction. The study conducted to estimate the concentrations of interleukin (IL)-10, IL-12, IL-17A and IL-23 in in the follicular fluid of “PCOS women”.

**MATERIAL AND METHODS**

This study was conducted on the patients attended special private clinics for the treatment of infertility in Baghdad city for the period from the end of July 2015 until the end of September 2016. The study included 55 women with polycystic ovary syndrome and 35 healthy women (relative of patients and didn’t suffer from any infection or chronic disease). The presence of “PCOS” was investigated by inquiring from their doctors and following up their sonar reports, as well as the presence of most clinical signs of the disease, such as the hirsutism, irregular menstrual cycle, and elevation of LH/FSH ratio. The follicular fluid was collected from the patients and the control group during the ovulation period, i.e. 12-14 days of the menstrual cycle, 3 ml of follicular fluid were collected by physician and then kept in the refrigerator freezing until for estimation of interleukin -10, IL-12, IL-17A and IL-23 in in the follicular fluid of “PCOS women” by using ELISA technique (Quantikine Co. USA)

**Statistical analysis**

Computerized statistically analysis was performed using Mintabver18.0 statistic program for determination of the P value (P<0.05: significant).

**RESULTS**

The current study showed that most PCOS, who reached the age of twenty to twenty-nine years and 60% of them and excess weight. All polycystic ovarian women were all affected by the appearance of hair in the bodies here (hirsutism). Study also showed that 65.45% of PCOS cases were suffering from the appearance of acne in their skin and majority of cases were with irregular menstrual cycle and positive family history of the syndrome and 74.55% were with alopecia, (Table1).
Table 1: Sign and symptoms associated with PCOS

<table>
<thead>
<tr>
<th></th>
<th>No.</th>
<th>%</th>
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<tbody>
<tr>
<td><strong>Age (mean 22.5 years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>33</td>
<td>60</td>
</tr>
<tr>
<td>&gt;29 year</td>
<td>22</td>
<td>40</td>
</tr>
<tr>
<td><strong>BMI (kg/m²)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30</td>
<td>20</td>
<td>36.36</td>
</tr>
<tr>
<td>&gt;30</td>
<td>35</td>
<td>63.64</td>
</tr>
<tr>
<td><strong>Hirsutism</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Acne</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>36</td>
<td>65.45</td>
</tr>
<tr>
<td>No</td>
<td>19</td>
<td>34.55</td>
</tr>
<tr>
<td><strong>Menstrual cycle</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>13</td>
<td>23.64</td>
</tr>
<tr>
<td>Irregular</td>
<td>42</td>
<td>76.36</td>
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<tr>
<td><strong>History in family</strong></td>
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<td></td>
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<tr>
<td>Present</td>
<td>33</td>
<td>60</td>
</tr>
<tr>
<td>Absent</td>
<td>22</td>
<td>40</td>
</tr>
<tr>
<td><strong>Alopecia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>14</td>
<td>25.45</td>
</tr>
<tr>
<td>Absent</td>
<td>41</td>
<td>74.55</td>
</tr>
</tbody>
</table>

The study demonstrated that IL-10 was significantly elevated in PCOS women” (P. value 0.0004) as compared with healthy women (33.8±3.71 vs. 17.5±2.84 pg/ml), Figure 1.

Figure 1: Level of IL-10 in follicular fluid of PCOS women and the control group

The study demonstrated that IL-12 was significantly reduced in PCOS women” (P. value 0.0012) as compared with healthy women” (1.26±0.02 vs. 3.09±0.011 pg/ml), Figure 2.
The study demonstrated that IL-17A was significantly elevated in PCOS women (P. value 0.001) as compared with healthy women (22.8±4.78 vs. 16.9±3.19 pg/ml), Figure 3.

The study demonstrated that IL-23 was significantly decreased in follicular fluid of PCOS women (P. value 0.008) as compared with healthy women (7.19±1.71 vs. 13.71±1.92 pg/ml), Figure 4.
DISCUSSION

The commonness of these cycle variations from the norm may change in unselected ladies with PCOS because they mirror the subgroup of PCOS ladies who have looked for medicinal consideration and in this manner are bound to show a progressively serious phenotype \(^{(2)}\). Then again, menstrual cycle anomaly is a moderately precise surrogate of ovulation and is effectively gotten from the restorative history \(^{(3)}\). Subsequently, menstrual cycle example may fill in as a marker of IR in patients with PCOS, as IR can actuate oligo-or anovulation and along these lines menstrual cycle anomaly by fueling hyperandrogenemia and by upsetting follicular development \(^{(4)}\). All things considered, not many little examinations assessed the relationship between period anomalies and the endocrine and metabolic attributes in PCOS \(^{(5,6)}\). Ovulatory brokenness, characterized as oligomenorrhea and amenorrhea, is a typical objection in ladies of regenerative age. The long haul confusions of ovulatory brokenness have not been very much examined. Hyperandrogenemia is thought to expand cardiovascular and metabolic dangers in ladies with PCOS\(^{(7)}\).

Little review studies revealed a rebuilding of ovulation with maturing in ladies with PCOS.\(^{3-5}\) However, none of these investigations portrayed in detail the menstrual cycle design in various age gatherings of PCOS patients\(^{(1,2)}\). In addition, women with PCOS are showing signs of weight gain related to menstrual irregularities, as well as irregular androgenic hormones, which in turn necessarily exacerbate menstrual symptoms\(^{(11,12)}\). These hormones including androgen hormone and not mainly directly with the age of women as well as irregular menstrual cycle, which necessarily leads to irregular egg production and thus will increase the proportion of infertility in them\(^{(13&14)}\). The ovarian cyst is a hormonal disease that is directly affected by the conditions surrounding women, including severe anxiety as well as eating type as well as hormones high fat content in the body that positively affected the weight gain as well as increased secretion of acne and the appearance of hair on the body\(^{(15)}\).

Some past examination exhibited that IL-10 was raised yet IL-23 was evoked in PCOS ladies which reflex sustain the neighborhood enactment of Th17/Th1 cells by discharging a lot of IL-22, and IFN-\(\gamma\)-driven inflammation\(^{(16)}\). There is no doubt that the high level of interleukin we come to exist in the body such as Inter but 10 attached directly attached to the back immunity as well as the introduction of NCDs directly affected by Rowan inflammation related to Alberto in infected women if polycystic ovaries which leads to high Interleukin 10 in women Infected compared to healthy women\(^{(9)}\). One study\(^{(17)}\) proposed that IL12 concentration was elevated more frequently in PCOS women than in healthy women specially in follicular fluid. Another study\(^{(18)}\) exhibited a positive elevation of IL-12 with the progression of the syndrome of poly cystic. In consistently other reports proposes that the level of interleukin-12 and 10 showed similar finding\(^{(16)}\), this which included two-way system in PCOS that affect female as regards to their clinical features. Our finding regarding, interleukins twelve and IL-10 may be related to the fact that, from one viewpoint, reverse connections were seen between FF IL-10 and PCOS, enacted T cells, and IL-12 focuses; though, then again, positive relationships were exhibited between FF androgen, initiated T cells, and FF IL-13 levels. In PCOS, it is realized that T-cells assume an essential job in the neighborhood neurotic instrument \(^{(19)}\). Raised grouping of numerous cytokines has been reported in the were reported to be elevated in affected women as compared with control healthy women\(^{(20)}\). Nonetheless, the expanded degrees of IL-17A might be identified with this provocative condition either as an outcome and vital marker in regulatory function of immune response in normal persons. In addition, the PCOS considered to be the critical situation in elevation in non-infected women in regrading of elevation in the
levels of IL-6 and TNF-acytokines\(^{(21)}\). Moreover, regulation of IL-17A has been showed to elevation several type of fluid like FF and synovial fluid\(^{(22)}\). Out and out, proof uncovered that IL-17A height can advance as well as lift professional provocative cytokines in “PCOS women”. So also, Chieldet al.\(^{(23)}\) has announced essentially solid ladies by and large, these information may propose potential impacts of IL-17A height in oocyte development in any event in “PCOS women”, another examination demonstrated that interleukin 17 was eventually higher in PCOS women with endometriosis\(^{(24)}\).

**CONCLUSION**

It was concluded that IL-10 and IL-17A were elevated in PCOS women while IL-12 and IL-23 were reduced as compared with control group.

**ETHICAL CLEARANCE**

The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**CONFLICT OF INTEREST**

The authors declare that they have no conflict of interest.

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