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Effect of obesity on PCOD (polycystic ovarian disorder)

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ABSTRACT

While many women with polycystic ovary syndrome (PCOS) are overweight, obese or centrally obese, the effect of excess weight on the outcomes of PCOS is inconsistent. The review aimed to assess the effects of overweight, obesity and central obesity on the reproductive, metabolic and psychological features of PCOS. MEDLINE, EMBASE, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL) and PSYCINFO were searched for studies reporting outcomes according to body mass index categories or body fat distribution. Data were presented as mean difference or risk ratio (95% confidence interval). This review included 30 eligible studies. Overweight or obese women with PCOS had decreased sex hormone-binding globulin (SHBG), increased total testosterone, free androgen index, hirsutism, fasting glucose, fasting insulin, homeostatic model assessment-insulin resistance index and worsened lipid profile. Obesity significantly worsened all metabolic and reproductive outcomes measured except for hirsutism when compared to normal weight women with PCOS. Overweight women had no differences in total testosterone, hirsutism, total-cholesterol and low-density lipoprotein-cholesterol compared to normal weight women and no differences in SHBG and total testosterone compared to obese women. Central obesity was associated with higher fasting insulin levels. These results suggest that prevention and treatment of obesity is important for the management of PCOS.

Keywords: obesity, ovarian

INTRODUCTION

Polycystic ovarian syndrome (PCOS) is a hormonal imbalance caused by the ovaries (the organ that produces and releases eggs) creating excess male hormones. If you have PCOS, your ovaries produce unusually high levels of hormones called androgens. This causes your reproductive hormones to become imbalanced. As a result, people with PCOS often have erratic menstrual cycles, missed periods and unpredictable ovulation. Small cysts may develop on your ovaries (fluid-filled sacs) due to lack of ovulation (anovulation). However, despite the name "polycystic," you do not need to have cysts on your ovaries to have PCOS. PCOS is one of the most common causes of female infertility. It can also increase your risk for other health conditions. Your healthcare provider can treat PCOS based on your symptoms and if you have plans for having children.

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders in women of fertile age, affecting 5–10% of the female population. The syndrome is characterized by chronic anovulation, hyperandrogenism, polycystic ovaries and decreased fertility. PCOS is furthermore associated with insulin resistance, accumulation of abdominal fat and obesity (BMI >30 kg/m²), which is present in approximately 50% of women with PCOS [1–3]. It is well known that reproductive function in women with PCOS is strongly dependent on body weight and the metabolic status of the patient. In the long term, PCOS is associated with an increased risk of Type 2 diabetes, cardiovascular disease, dyslipidemia and endometrial cancer. Therefore, the syndrome is recognized as having a major impact throughout life on the gynecological and metabolic health of women. Polycystic ovary syndrome is a heterogeneous disorder that presents with a spectrum of symptoms and manifestations that vary over time. This leads

to difficulties in diagnosing the syndrome. The diagnostic criteria for PCOS were revised at an International Expert Conference in Rotterdam in 2003.

However, this definition has been criticized owing to the fact that it broadens the population of women who will meet the criteria for PCOS, since it includes women with regular menses who also have polycystic ovaries. Furthermore, hyperandrogenism is not required for the diagnosis. Recently, the Androgen Excess Society recommended that PCOS should be considered a disorder of androgen excess and that the original NIH criteria of 1990 should be accepted with some modifications. Thus, the criteria for a PCOS diagnosis are still under debate. The etiology of PCOS is largely unknown, even though the syndrome was first described in 1935 by Stein and Leventhal. Several etiological factors have been postulated, including genes involved in androgen and/or insulin actions, androgen programming in utero, as well as environmental factors. There is strong evidence that PCOS has a genetic background, which is supported by increased familiar occurrence and by twin studies [7–9]. However, so far, no single gene defect has been identified and, therefore, PCOS is more likely to be a polygenic disorder. Experimental animal models have demonstrated that prenatal exposure to androgens is associated with many of the features typical of PCOS, such as abnormal luteinizing hormone secretion, hyperandrogenism, anovulation, abdominal adiposity and insulin resistance in adult life. However, the clinical relevance of this hypothesis remains to be elucidated. Furthermore, it has been hypothesized that insulin resistance is a socio ecological adaptation to behavioral changes in reproductive and lifestyle habits. Overweight and obesity are of particular importance for the development of PCOS. A major concern for women with PCOS is decreased fertility, which is aggravated by obesity and metabolic aberrations. This review will focus on the association between PCOS and obesity and the mechanisms by which obesity influences reproductive function and pregnancy outcome in women with PCOS.^[2]

AIM AND OBJECTIVES

To identify the effectiveness of obesity on PCOD, To understand the PCOD Disease in depth and its effects on women nowadays. To study the relevant risk factors of polycystic ovarian syndrome (PCOS) of Patients so as to provide basis for early diagnosis and treatment of PCOS. The overall aims of treatment are to induce ovulation for women desiring conception, to reduce androgen levels, to reduce body weight and to reduce long-term health risks of diabetes mellitus and cardiovascular disease.

METHODS

Design

A cross-sectional study was conducted by administering a questionnaire to registered physicians in various cities of

Hyderabad and Medchal, Telangana. Self designed and developed the questionnaire. The distribution of survey forms to pharmacists was done and visited the hospitals on daily basis. Although questionnaires commonly have a low reaction rate, the creators considered this sort of information assortment as the ideal way to deal with accomplish the motivation behind this study, which was to investigate the personal preferences of physicians and gynecologists pertaining to treat patients with PCOS and study the patients case sheets and to study the main effect of obesity on PCOS. The approach survey enabled us to comply with the Covid-19 lockdown guidelines, thereby making it an optimal approach for data collection.

Sample of the study

50 cases were recruited from hospitalized patients in our local area (Telangana) where women population is concentrated. All cases met the diagnosis criteria of PCOS published, which defines a PCOS patient as one who must have symptoms of oligomenorrhea and amenorrhea or abnormal uterine bleeding as well as one of the two following symptoms: hyperandrogenism and polycystic ovaries. Other cause of hyperandrogenism and polycystic ovaries must be excluded to make the diagnosis. Patients with malignant tumor, cardiovascular disease, server organic disease, and psychiatric issues were excluded from the sample.

Participants

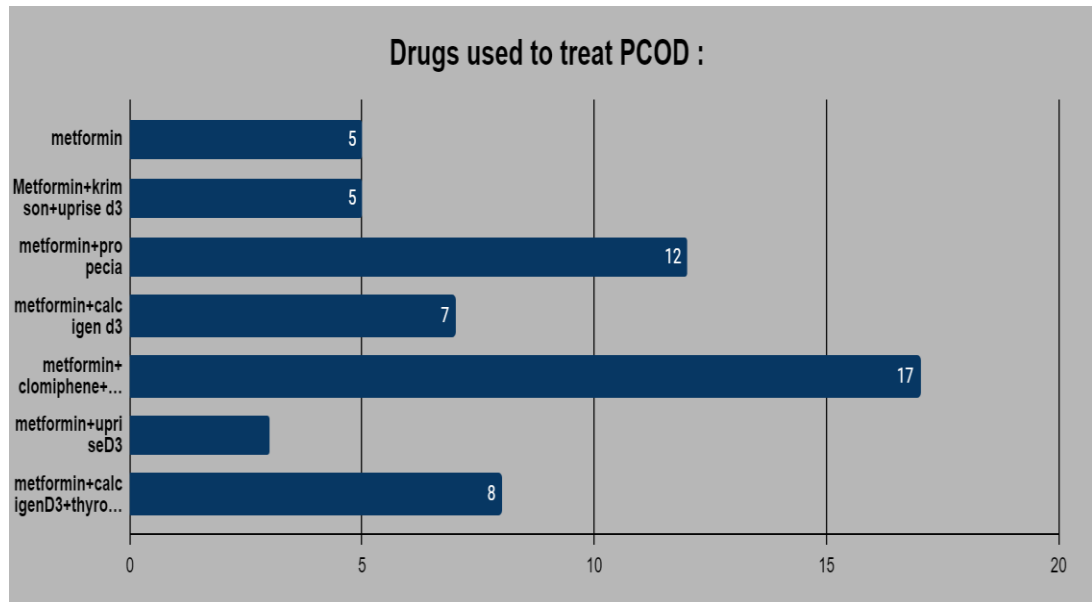
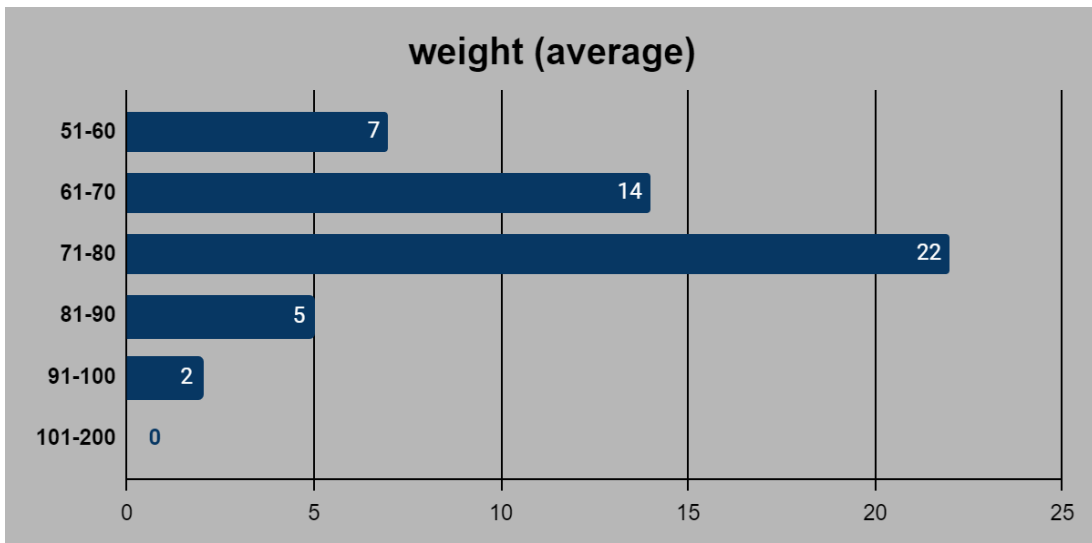
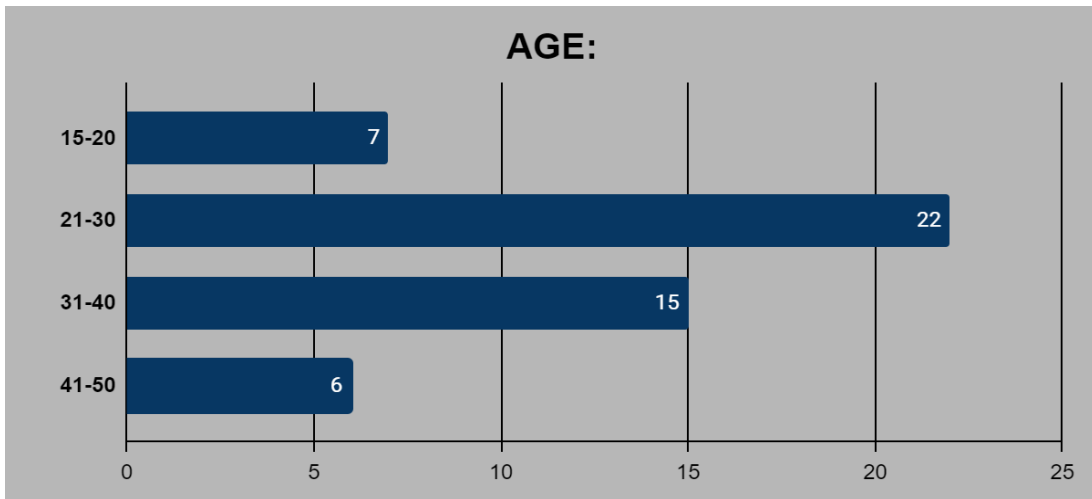
To be qualified for this investigation, the respondents had to be registered as licensed Physicians, gynecologists under Telangana State medical Council. Personnel like interns, medical students were not included in the Study.

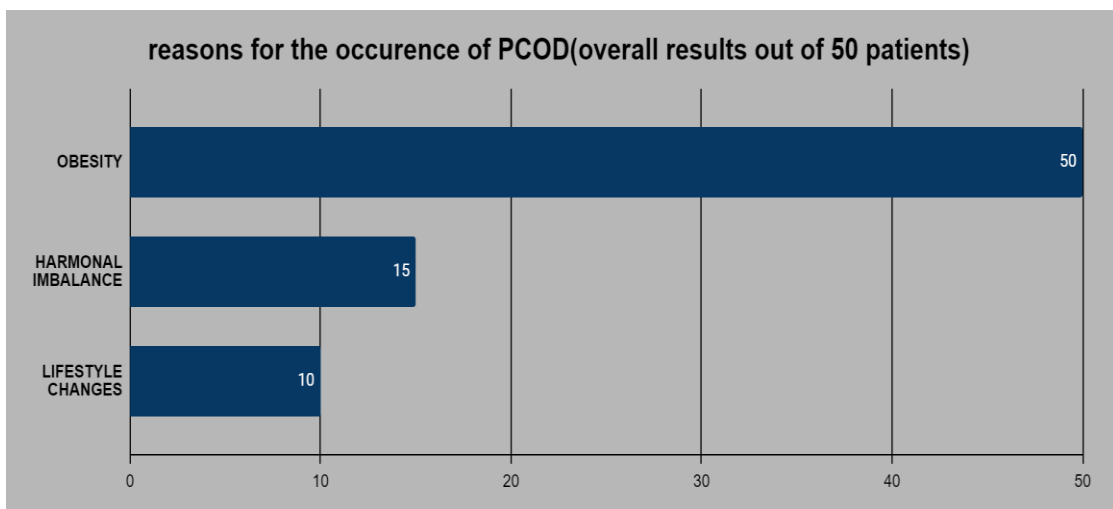
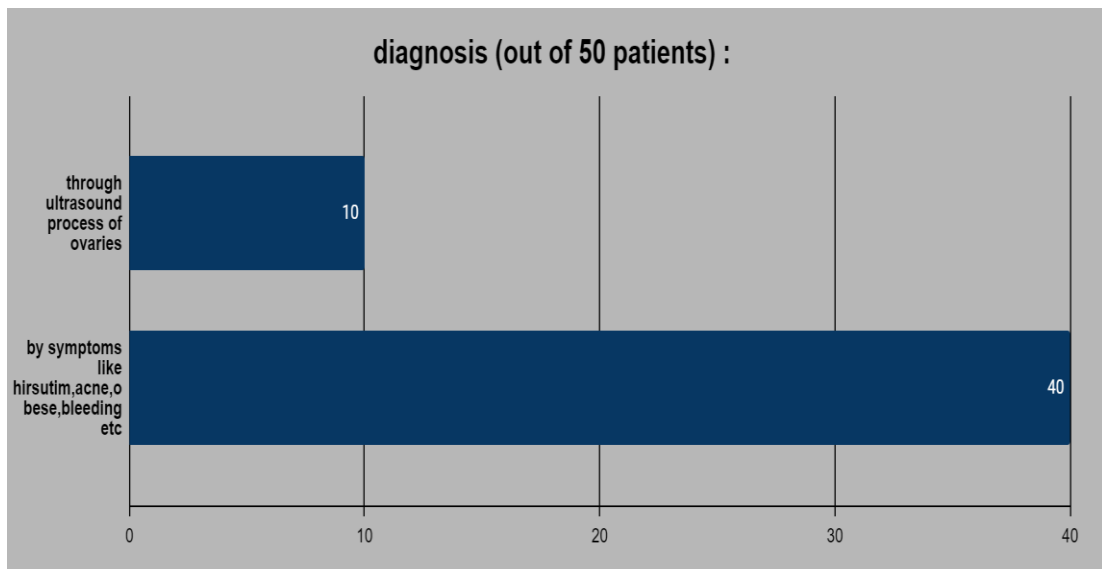
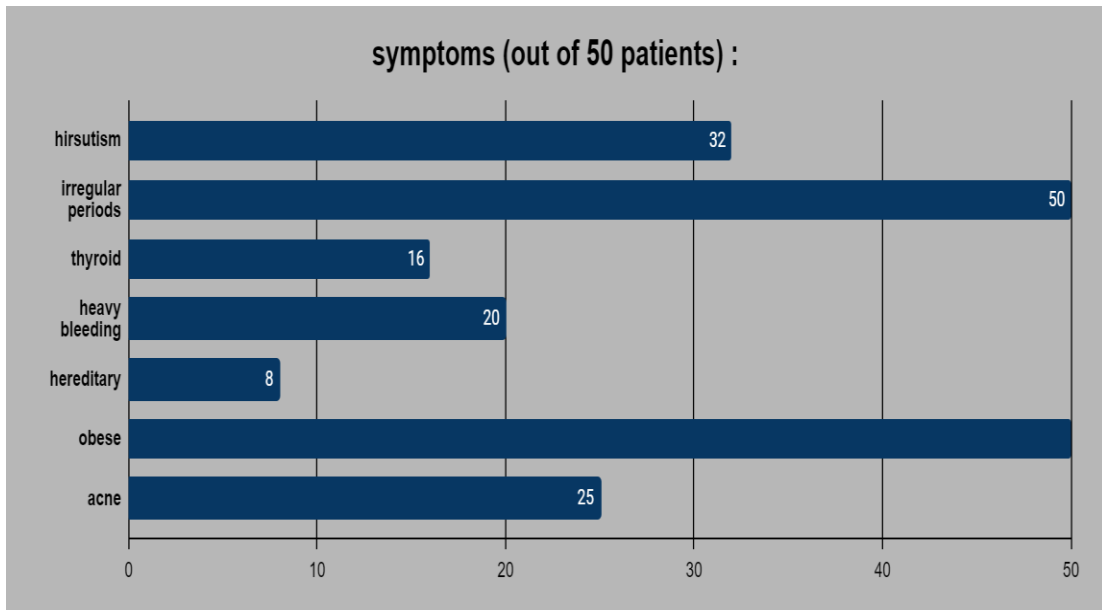
Data collection

Self-designed questionnaire (case sheet) was handed out among case and control groups. Data collected include patients' age, address, BMI, age, length of period cycle, marital status, education, vocation, menstrual disorder, alcohol intake, tea drinking, mood, family relationship, family history of PCOS, family history of diabetes, family history of infertility, mother's irregular menstruation and lack of physical exercise. Data of other PCOS-related conditions including hirsutism, acne, skin conditions and ultrasound findings of ovarian were also obtained.

RESULTS

Univariate analysis of risk factors for PCOS it can be interpreted that age, marital status, education, vocation, irregular menstruation, alcohol, tea drinking, bad mood, family relationship, family history of PCOS, family history of diabetes, family history of infertility and mother's irregular menstruation were all significantly related to the incidence of PCOS.





DISCUSSIONS

Etiology of PCOS is still inconclusive due to its complexity. One study attributes its cause to the interaction between genetic and environment factors [6]. Due to the fact that PCOS patients share one significant clinical manifestation of hyperandrogenemia, male hormone has been widely acknowledged as a biomarker for PCOS in recent years. Except for hyperandrogenemia, PCOS also involve obesity, insulin resistance and type 2 diabetes and all of these complications lead to the ovarian production of androgen. Some studies also suggested that adolescent obesity increases the probability of PCOS at a later stage of life and insulin resistance as well as ensuing hyperinsulinemia may directly or indirectly result in LH secretion that leads to hyperandrogenemia [7,8]. As it has been confirmed obesity is the main risk factor for type 2 diabetes, there is a hypothesis that obesity, insulin resistance as well as hyperandrogenism were all potential risk factors for PCOS. Ethnic differences play an important part in metabolism of PCOS, including in insulin resistance, glucose intolerance, dyslipidemia and so on. With regard to the high incidence rate of PCOS of Li People in Hainan Province, it might be concerned with lifestyle affecting metabolic factors.

Results of the study indicates that the risk factors for PCOS including irregular menstruation, family history of infertility and diabetes, mother's irregular menstruation, unpleasant mood, and lack of physical exercise. Most PCOS patients experience the onset of irregular menstruation since adolescence and Endocrine dyscrasia along any part of the hypothalamic-pituitary-gonadal axis may lead to irregular menstruation and anovulation [9]. It is also confirmed by our study that PCOS is closely related to irregular menstruation. IR as an important contributor to PCOS was found in some of our participants and some studies reported that percentage of IR among PCOS patients was as high as 50%–70% [10]. Family history of diabetes, notably inherited metabolic disorders, also poses significantly high risk for PCOS. This is consistent with the finding of Roe et al [11]. Tian et al [12] reported the odds ration of mother's infertility OR was 8.599 while our study found that it was 11.953, which suggested the heredity of the PCOS disease. The correlation between mother's irregular menstruation and the daughter's also

contribute to higher risk of PCOS of the daughter. Our study suggested that mother's irregular menstruation can be translated into a 2.557 odds ratio of daughter's PCOS, which is similar to the findings of Bates et al [13]. Both national and abroad psychology evaluation studies discovered severe mental or psychological disorder among PCOS patients, and it is inferred that unpleasant mood also increase the risk for PCOS. Research of Xiao et al described similar findings in this aspect [14]. Lack of physical exercise, leading to uneven distribution of body fat, is an important risk factor of centripetal obesity. One study advises proper diet and regular physical exercise to obese PCOS patients to achieve significant alleviation of symptoms like excessive hair and irregular menstruation and if combining medicine with kinesitherapy and Individualized nutrition therapy within three months patients can also expect significant improvement in metabolism and internal secretion [15].

The lifestyles play different extent to affect insulin resistance and lipid metabolism disorder and human metabolic disorders also would induce to the incidence of PCOS. This study result showed that the factors of metabolic diseases included in diabetes history and lack of physical exercise, and the other metabolic disease factors were not contained in this study, because of the limitation of epidemiologic survey. In the future study, we should further improve project design.

CONCLUSION

To target the high risk factors of menstrual cycle disorder, family history of diabetes, family history of infertility, family history of diabetes, bad mood and lack of physical exercise of female population, we should implement early screen, diagnose and treatment of PCOS in order to reduce the incidence rate of PCOS and improve prognosis of PCOS. Women with PCOS, in addition to anovulation and infertility, have an increased risk of developing hypertension and cardiovascular disease in association with metabolic syndrome. The diagnosis of PCOS is fundamentally clinical. Treatment of PCOS is limited to management of signs and symptoms since the etiology of the disorder is unknown. There is a need for further studies to understand the pathophysiology of PCOS and the development of high blood pressure in women suffering from the disorder.

REFERENCES

1. McGowan MP. Polycystic ovary syndrome: a common endocrine disorder and risk factor for vascular disease. *Curr Treat Options Cardiovasc Med.* 2011 Aug;13(4):289-301. doi: 10.1007/s11936-011-0130-0, PMID 21562798.
2. History of discovery of polycystic ovary syndrome. *Adv Clin Exp Med.* 2017 May-Jun;26(3):555-8. doi: 10.17219/acem/61987, PMID 28791833.
3. Pace Hospital. com/PCOD-polycystic-ovary-disease-cause-symptoms-and-treatment.
4. Sam S. Obesity and polycystic ovary syndrome. *Obes Manag.* 2007 Apr;3(2):69-73. doi: 10.1089/obe.2007.0019, PMID 20436797, PMID 2861983.
5. Andrade VH, Mata AM, Borges RS, Costa-Silva DR, Martins LM, Ferreira PM et al. Current aspects of polycystic ovary syndrome: A literature review. *Rev Assoc Med Bras (1992).* 2016;Dec(9):867-71. doi: 10.1590/1806-9282.62.09.867, PMID 28001262.
6. Society of Gynecology and Obstetrics of the Chinese Medical Association. Expert consensus for diagnosis and treatment of polycystic ovarian syndrome. *Chin J Obstet Gynecol.* 2008;43(7):553-5.
7. Zhang JY, He H. Risk factors and treatment for infertility caused by polycystic ovarian syndrome. *Hainan. Med,* 25 (12). 2014;7:1750-3.
8. Li FX, Fan GL, Yi JP. Research review on risk factors for cardiovascular disease among polycystic ovarian syndrome patients. *Matern Child Health Care China,* 27 (32). 2012;8:5218-20.

9. Du JY, Xu ZY, Feng JY. Impact of environment on the incidence of polycystic ovarian syndrome in the Weihai district. *Chin J Healthy Birth Child Care*. 2012;18(5):269-72
10. Karakas SE, Kim K, Duleba AJ. Determinants of impaired fasting glucose versus glucose intolerance of polycystic ovary syndrome. *Diabetes Care*. 2010;33(4):887-93. doi: 10.2337/dc09-1525, PMID 20067969.
11. Roe AH, Prochaska E, Smith M, Sammel M, Dokras A. Using the androgen excess-PCOS society criteria to diagnose polycystic ovary syndrome and the risk of metabolic syndrome in adolescents. *J Pediatr*. 2013;162(5):937-41. doi: 10.1016/j.jpeds.2012.11.019, PMID 23260096.
12. Tian XX, Ruan XY, Wang J, Liu SY, Yin DM, Lu YJ, et al. Analysis of risk factors for 437 cases of polycystic ovary syndrome. *J Cap Univ Med Sci*. 2014;35(4):414-8.
13. Bates GW, Legro RS. Longterm management of polycystic ovarian syndrome (PCOS). *Mol Cell Endocrinol*. 2013;373(1-2):91-7. doi: 10.1016/j.mce.2012.10.029, PMID 23261983
14. Xiao WH, Qiu XY, Zhang T, Zhuang AW. Study on the mood of polycystic ovarian syndrome patients. *Zhejiang J Trad Chin Med*. 2011;46(11):795-796
15. Le Donne M, Alibrandi A, Giarrusso R, Lo Monaco I, Muraca U. Diet, metformin and inositol in overweight and obese women with polycystic ovary syndrome: effects on body composition. *Minerva Ginecol*. 2012;64(1):23-9. PMID 22334228.