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Application of Herbal Medicines for Obesity Treatment in the Polycystic Ovarian Syndrome Women

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Abstract

Polycystic ovarian syndrome (PCOS) is a frequent disorder commonly found in reproductive-aged women. The disease PCOS in women is considered to be complex heterogeneity, which indicates the combined combination of genetics and environmental interaction factors. Insulin resistance, type 2 diabetes mellitus, and obesity are known to be the risk factors for the development of PCOS. The prevalence of obesity in Saudi Arabia is ripening equally in both men and women. Herbal Medicines are often used for the treatment of human diseases by traditional medicine. Herbal remedies are often used to treat PCOS women due to the similar effectiveness exists as Western anti-obesity drugs. This study aimed to acknowledge the usage of herbal medicines for the prevention of obesity in PCOS women. This is a cross-sectional study carried out in reproductive-aged women in the Saudi population. PCOS women were provided with the questionnaire form if they are using the herbal products for the treatment of obesity. In this study, 85 PCOS women with obesity have been selected. The clinical and usage of herbal details have been recorded. In this study, 70.5% of women were using green tea, 19.8% and 11.7% were using the ginger and flax seeds. Turmeric, Capsicum and fenugreeks were used by 25.8%, 4.7% and 18.8% respectively. In conclusion, the PCOS women has high usage of green tea rather than other herbal medicines.

Keywords: Polycystic Ovarian Syndrome, Herbals, Obesity, Green-Tea

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INTRODUCTION

Polycystic Ovarian Syndrome (PCOS) in women is recognized as an endocrine disorder in reproductive-aged women[1]. PCOS is characterized by irregular menses, hyperandrogenism, micro-polycystic ovaries and metabolic abnormalities[2]. PCOS is known to be a common cause of anovulatory infertility; however, the mechanisms of anovulation endure not known[3]. Based on Rotterdam criteria, PCOS was diagnosed by confirming clinical features of three out of two; (i) oligo-anovulation, (ii) hyperandrogenism and (iii) appearance of polycystic ovaries in ultrasound [4]. Every 16-20% of reproductive women are facing both infertility and menstrual problems[5]. PCOS is associated with pancreatic β-cell dysfunction; also increased the risk of metabolic syndrome (MetS)[6]. Insulin-resistance (IR), obesity, and type 2 Diabetes Mellitus (T2DM) are the major complications for PCOS women[7]. PCOS women with obesity tend to have probabilities of emerging MetS by hovering abnormal values in fasting, lipid profile, and IR[8]. The complete understanding of aetiology in PCOS women is not updated; this disease in women is considered as multifactorial disorder in genetic, endocrine, environmental, metabolic anomalies[9]. There is no active treatment is available for PCOS women. However, lowering of Body Mass Index (BMI) in PCOS women is one the therapies for restoring regular menses and improve response towards ovulation, involve medication of fertility[10]. Various pharmaceutical treatments were developed with side-effects such as long-term treatments with lower efficiency and contraindications in PCOS women and simultaneous is complementary treatment. Common selection is opting oral contraceptives towards the treatment in PCOS women[11]. The majority of PCOS women with hyperandrogenic will select life style intervention and oral contraceptives towards the treatment; which involves estrogen, progestins for release of luteinizing hormones[12]. Metformin usage is associated with high dose of gastrointestinal adverse effects[13]. Apart from these, several herbal medicine studies have been documented in PCOS women[11,14-18].

Since the antient times, herbal drugs are used as medicines for treating human diseases and medicinal plants play an important role as natural products have known to be the major source of medicines[19]. Herbs can be used for weight loss therapy in obesity population and crude plants were used in the form of herbs globally to treat obesity[20]. *Zingiber officinale Roscoe* (ginger) from the family of *Zingeiberaceae* family lowers serum levels in fasting glucose, insulin, low- and high-density lipoprotein-cholesterols[21]. PCOS is connected with T2DM through obesity and insulin resistance and lower serum levels can lowers the disease[22]. Liao et al.[23] performed herbs and herbal treatment in PCOS women through Jia-Wei-Xiao-Yao-San and Xing-Fu; were commonly used herb and these showed the positiveness towards the treatment in Taiwanese PCOS women. Multiple studies have been investigated for the worth of safe herbal drugs in treating excessive weight gain. However, a clinical trial has been conducted in Chinese population on traditional Chinese medicine on 140 obese patients and using herbal products for 6 months and positive results were obtained without any side-effects[24]. The prevalence of obesity in Saudi Arabia is epidemic and simultaneously with the PCOS women. There are no studies have been conducted in the Saudi population women diagnosed with PCOS and using the herbal medicines. Therefore, the present study aimed to investigate usage of herbal medicines for the prevention of obesity in PCOS women.

MATERIALS AND METHODS

In this study, 85 PCOS women with obesity have been opted and selected from Capital city of Kingdom of Saudi Arabia. Based on Rotterdam criteria[25], PCOS women were selected. All the women involved in this study were Saudi citizens. The inclusion criteria of the cases were PCOS women with obesity and exclusion criteria were PCOS women with non-obesity, non-PCOS women with or without obesity. The selected women in this study has filled questionnaire form. The data collection form consists of anthropometric details, such as age, BMI and family histories of PCOS. The baseline characteristics involved types of herbal medicines used for treatment of obesity in PCOS women, green tea, capsicum, ginger, turmeric, flax seeds and fenugreeks. BMI was calculated using weight in kilograms and height in centimeters[26]. Ethical grant was obtained for this study (Grant number-19-4344). Statistical analysis

Table 1. Anthropometric features of involved PCOS women

S. No	Anthropometric Features	PCOS cases
1	Age	32.1±11.2
2	BMI	33.1± 8.6
3	Gender (Female)	100% (n=85)
4	Nationality (Saudi)	100% (n=85)
5	Family History of Obesity	71.7% (n=61)

include mean±standard deviation, frequencies and percentages was performed with Openepi software as described in Khan et al[27].

RESULTS

In this study, 85 PCOS-obesity women were involved. The anthropometric details were involved in Table 1. The mean age of the PCOS women are 32.1±11.2 and their BMI was found to be 33.1± 8.6. In this study, 100% Saudi women were involved with 71.7% as known to be their family history of obesity. However, family history of PCOS was not documented and this could be the one of the limitations of this study.

The list of use of herbal medicines have been listed in Table 2. None of the women have used the herbal medicine for weight loss for obesity in PCOS women. However, 70.5% of women use green tea in their routine life. Only 19.8% of women used ginger in the early morning. The frequency usage of flax seeds was 11.7% and 25.8% have used the turmeric. In this study, the overall lower frequency of used by PCOS women are capsicum which is 4.7% and 18.8% were using fenugreek seeds to lowers the BMI.

DISCUSSION

PCOS is known as common gynecological with endocrine and metabolic disorders and its prevalence rate in childbearing aged women are in between 3.4%-13% respectively. PCOS patients are found to be obese when compared with healthy women and the incidence of PCOS is mounting randomly throughout the world. One of the reasons for this could be modified lifestyle with uncontrolled diet. However, based on genetics point of view, a relationship has been built between obesity associated genes with susceptibility to PCOS with combined combination of results[28]. Obesity is confirmed as one of the risk factors in

Table 2. Herbal medicine used for obesity treatment in PCOS women

S. No	Plant medicines	PCOS women
1	Herbal medicines usage	0 (0%)
2	Green tea	60 (70.5%)
3	Ginger	14 (19.8%)
4	Flax seeds	10 (11.7%)
5	Turmeric	22 (25.8%)
6	Capsicum	04 (4.7%)
7	Fenugreeks	16 (18.8%)

PCOS women which exacerbates reproductive and metabolic effects. Obesity is known to induces mild-chronic inflammation in adipose tissues which increases insulin resistance further leads to T2DM, dyslipidemia and cardiovascular diseases[29]. Obesity is commonly appearing in all formats of human diseases but not in the thin healthy organisms. However, PCOS is clearly observes in non-obese women[30]. The accurate of prevalence of PCOS has not been documented but based on city wide studies it was known to be high prevalences. There are limited studies have been documented in PCOS in Saudi population and current study was known to be the initial study implemented in Saudi PCOS and obesity women using the herbal medicines. Unfortunately, none of the PCOS women is using the herbal medicines for weight loss. However, flaxseeds, ginger, green tea, capsicum, turmeric and fenugreek seeds were using to maintain or lose weight. There are limited studies have been used the complimentary medicine and amongst them herbal medicines are precise type of medicines. Herbal medicines necessitate pharmacologically active constituents through physiological effects in women with endocrinological disorders. It has been significantly associated with lowering the incidences of human health complications and the diseases. Pharmacological treatment for PCOS women for menstrual issues are using the oral contraceptive pills and ovulation induction with clomiphene citrate as per the fertility requirement. *Tribulus terrestris*, *Glycyrrhiza spp*, *Paeonia lactiflora* and *Cinnamomum cassia* determines the morphological modifications in PCO[31]. In this study, *Zingiber officinale Roscoe* (ginger) has been used by 19.8% PCOS women to lowers the BMI and ginger is from Zingeiberaceae family reduces

serum levels of fasting glucose, insulin, low-high levels of density lipoprotein levels. Other studies have confirmed as ginger upraises the antioxidant capacity in blood as well as augments the serum levels for GPx, SOD and CAT[21].

The limitations of this study are opting the low sample size, not documenting the family history of PCOS and not involving the control subjects. The strength of this study was recruiting 85 Saudi women diagnosed with PCOS based on Rotterdam criteria[25]. In conclusion, PCOS women has high usage of green tea rather than the herbal medicines. Further studies should be carried out in large sample size and awareness program should be implemented towards the herbal medicines. Similar studies should be implemented worldwide.

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None.

ETHICS STATEMENT

This article does not contain any studies with human participants or animals performed by any of the authors.

DATA AVAILABILITY

All datasets analyzed during this study are included in the manuscript.

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