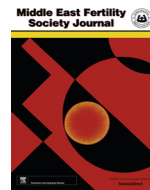


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Original Article

Profile on personality types and cortisol in polycystic ovarian syndrome ☆

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ABSTRACT

Objective: To understand the profile of personality types and cortisol in patients with polycystic ovarian syndrome (PCOS).**Methods:** Cross-sectional study conducted in Infertility Polyclinic of Dr. Cipto Mangunkusumo General Hospital and Immunoendocrinology Intergrated Makmal, Faculty of Medicine University of Indonesia (FKUI). Polycystic ovarian syndrome diagnosed based on Rotterdam consensus 2003. Blood samples were taken to examine cortisol and other hormones level. Personality profile was assessed using Minnesota Multiphasic Personality Inventory (MMPI).**Results:** We divided 36 cases of polycystic ovarian syndrome into 3 types of personality, i.e.: normal personality in 5 (14%) cases, neurotically inclined personality in 23 (64%) cases, and in psychotically inclined personality in 8 (22%) cases. Cortisol levels in the groups of neurotically inclined personality ($10.7 \pm 10.86 \mu\text{g/dL}$) and psychotically inclined personality ($10.2 \pm 2.18 \mu\text{g/dL}$) were higher than those in the group of normal personality ($8.4 \pm 1.05 \mu\text{g/dL}$) either in all cases or when they were separated from the group with positive insulin resistance.**Conclusion:** There was a weak, positive relationship between personality type and cortisol in polycystic ovarian syndrome, and the cortisol level was found to be higher in neurotically inclined and psychotically inclined personalities than in normal personalities with PCOS.© 2017 Middle East Fertility Society. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

15–25% women of the reproductive age would undergo an anovulated cycle [1]. As high as 75% of the anovulated cycles would develop into chronic anovulation. It has been shown that 80% of polycystic ovaries clinically appeared as polycystic ovarian disease (PCOD) [2]. In 5–10% of women at reproductive age, this polycystic ovarian disease would have complete symptoms as polycystic ovarian syndrome (PCOS) [2].

In Indonesia, study that conducted in 2000, it was projected that polycystic ovarian syndromes would be encountered in 7,419,468 Indonesian women [3].

The basic pathophysiology of polycystic ovary was not yet been revealed; however, it was commonly agreed that insulin resistance, excessive androgen hormone and gonadotropin hormonal

abnormality, as well as neuroendocrine disorders were implicated in this condition [4,5]. Lobo [6] and Dunaif [7] have demonstrated a relationship between insulin resistance and decreased level of sex hormone-binding globulin (SHBG) serum and increased level of luteinizing hormone (LH). In his study, Lobo [6] showed that 80% of PCOS were due to insulin resistance. On the other hand, Muharam et al. [8] found insulin resistance in only 64.8% of PCOS cases. The effect of insulin resistance in the long term could generate other metabolic disorders, such as dyslipidemia, hypertension, and risk of coronary heart disease.

A number of studies on PCOS in certain ethnics showed a genetic relationship which was passed down in autosomal-dominant way, such that hyperinsulinemia condition occurring in PCOS was suspected to be influenced by genetic abnormalities [9]. By contrast, the study conducted by Rasgon [10] and Weiner [11] showed the presence of mood disorder in patients with PCOS.

Kalantaridou [12] and Kirschbaum [13] suggested that Hypothalamus-Hypophysis-Adrenal (HHA) system which would become active when one was depressed would generate suppressive effect on the women's reproductive system. Corticotropin-

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releasing hormone (CRH) would suppress the secretion of Gonadotropin-releasing hormone (GnRH).

Kondoh [14] and Tsilchoroziduo [15], who performed evaluation in women with polycystic ovarian syndrome found the level of adrenocorticotrophic hormone plasma (ACTH) and cortisol to be higher in PCOS patients than in healthy women, due to ACTH stimulation in adrenal gland resulting in increased cortisol level. They also studied the relationship of cortisol level in PCOS, and found that there was an increased level of cortisol and androgen in lean women with PCOS.

Weiner found PCOS women with testosterone free of 10–26 pg/ml to be more depressive than women without PCOS or PCOS women with testosterone free greater than 26 pg/ml [11]. There are certain personalities that are more likely to experience stress. they had led some investigators to associate polycystic ovarian syndrome with stressed condition [10,11,14].

State of hypercortisolemia has been studied that it influences metabolism and anti-inflammatory reaction, which affects neurotransmission processes and neuron survivals [16]. Excessive glucocorticoids is associated with hippocampal atrophy and this condition may induced learning ability and memory, after producing symptoms of depression [17]. Changes in hippocampus and neurons in frontal lobes which highly reactive toward glucocorticoid resulted in HPA reactivity [18]. Abnormal HPA function and automatic glucocorticoid abnormality portrays fragile genetic factors that may persuade and exaggerate trail of mood disorder [19].

The goal of this research is to understand profiles of personality type and cortisol in patients with polycystic ovarian syndrome (PCOS), and specifically to evaluate the effects of personality type and cortisol in patients with polycystic ovarian syndrome (PCOS)

2. Material and methods

This research was an observational study with cross-sectional survey to examine the effects of personality type on cortisol in polycystic ovarian syndrome (PCOS). We conducted this research at both Dr. Cipto Mangunkusumo General Hospital's Department of Obstetrics and Gynecology, specifically the Reproductive Immuno-endocrinology's Infertility Polyclinic, and Integrated Makmal of Immunoendocrinology, Faculty of Medicine University of Indonesia.

Study samples were taken from all female patients with polycystic ovarian syndrome (PCOS) aged 20–35 years old. All subjects who met the inclusion criteria were included in the study up until the number of subject was adequate.

Inclusion criteria includes the following: women of reproductive age (20–35 years); developed polycystic ovarian syndrome; did not take medications, such as contraceptive pills, prednisone, herbal medication, anti-diabetic medication, hormonal acne medication; and willing to participate in the study. Exclusion criteria comprises of: hypertension; diabetes mellitus; congenital adrenal hyperplasia; and refusing to participate in the study.

We provided the subjects with explanations on the objectives and purposes of the study to the subjects of the study. After the subjects had understood and consented, they would provide a written consent in the informed consent form. Subjects were also informed that any data obtained from examinations would be recorded in a study questionnaire sheet (subjective complaints, database of physical examinations, risk factors, and examination of hormonal analysis). Diagnosis of polycystic ovarian syndrome was then performed based on Rotterdam Consensus 2003, i.e. confirmed diagnosis of polycystic ovarian syndrome must be supported by the following 3 criteria: oligo-anovulation; clinical signs and biochemical signs of hyperandrogenemia (ruling out other signs of hirsutism, such as congenital adrenal hyperplasia,

androgen-secreting tumor, Cushing syndrome, thyroid disease, hyper-prolactinemia); and presence of polycystic ovaries at ultrasonographic examination.

The presence of polycystic ovaries at ultrasonographic examination was confirmed by these one of these indicators: transvaginal USG showed at least 15 follicles with a diameter of 2–10 mm and/or ovarian volume >10 ml on one field; or transabdominal USG showed at least 16 follicles with a diameter of 2–8 mm on one field, peripherals were formed around the thickening ovarian stroma and/or ovarian volume >10 ml.

Further screening was performed to ascertain whether or not subjects of the study were eligible for the research, which included MMPI test to classify subjects into 3 groups of personality type: normal; neurotically inclined; psychotically inclined.

Blood samples were taken to examine cortisol, testosterone, SHBG, DHEA in 10 ml at Integrated Makmal of Immunoendocrinology, Faculty of Medicine University of Indonesia.

Data of the study which were obtained were recorded in a special form and processed electronically using software designed to calculate statistically with SPSS 20.

3. Results

3.1. Characteristics of study cases

During the study conducted we found 36 PCOS cases, with mean age of responders is 28 ± 4 years. In this study, there were 31 (86%) cases with primary infertility, 3 (8%) cases with secondary infertility, and 2 (6%) non-infertility cases, but with menstrual disorder of oligomenorrhea (Fig. 1). Moreover, the profile of obesity cases with PCOS consists of 16 (44%) cases with obesity and 20 (56%) non-obese cases (Fig. 2), followed by the cases with insulin resistance, there were 16 (44%) without insulin resistance cases and 20 (56%) with insulin resistance cases (Fig. 3).

As shown in Table 1, ratio level of LH/FSH was 2.2 ± 0.32 , with LH level of 2.2 ± 0.32 mU/ml higher than FSH level of 6.4 ± 0.29 mU/ml. In addition, testosterone level was 0.72 ± 0.14 ng/ml, and cortisol level 1038 ± 0.80 µg/dl.

3.2. Profile of personality type in relation to PCOS

Fig. 4 shows that 36 cases with polycystic ovarian syndrome could be divided into 3 personality types, i.e., normal personality in 5 (14%) cases, neurotically inclined personality in 23 (64%) cases, psychotically inclined personality in 22% cases

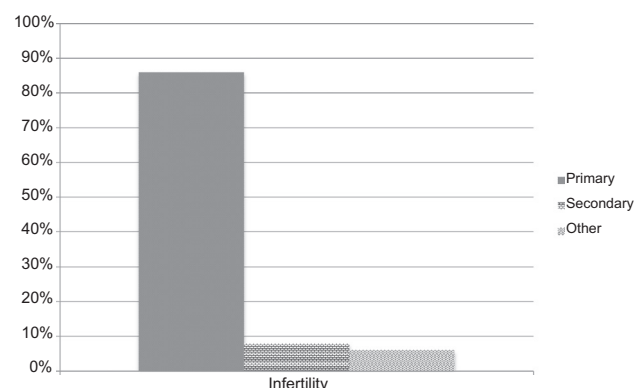


Fig. 1. Distribution of infertility cases in polycystic ovarian syndrome.

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