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Review

The Polycystic Ovary Syndrome – A Medical Condition but also an Important Psychosocial Problem

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A B S T R A C T

PCOS, the leading cause of anovulatory infertility that affects up to one fifth of the female population, is a complex chronic disease of genetic as well as environmental determination, but still unclear etiology. Besides of infertility, PCOS leads to menstrual dysfunctions, hirsutism and obesity – symptoms that are known to cause profound psychosocial distress. The present paper review the problematic of etiology and symptom expression of PCOS, which is not only a disease needing medical treatment but also a psychosocial problem for the affected women. PCOS may not only coinduced by psychosocial factors, the main symptoms of PCOS such as infertility, menstrual dysfunctions, hirsutism and obesity cause by themselves increased psychosocial stress.

Introduction

Although the world population reached six billion people shortly ago, infertility is an increasing problem. Approximately 20% of couples in Western societies experience infertility[1], being one third due to the combined infertility of both the partners, another third to the women alone, and one fifth to men alone[2]. Besides the well known demographic and economic effects of decreasing population size, infertility represents first of all a personal problem for the affected individuals. Especially for the infertile women, childlessness is an enormous psychological burden often associated with divorce, low social status and lowered self-perception because motherhood is perceived as an important part of female identity. Infertility occurs in association with various disorders, the most common cause of anovulatory infertility however, is the Polycystic Ovary Syndrome[3], affecting approximately 5% of the female population of reproductive age[4], independent of ethnicity. In clinical practice, women with this diagnosis are seen for four main

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symptoms: infertility, menstrual irregularity, obesity, and hirsutism[5,6]. The symptoms on their own as well as in association are known to cause profound psychosocial impact. Although the etiology is far from being understood, it seems clear that genetic, behavioural and psychosocial factors[7–15] play import roles in the pathogenesis of PCOS in which clinical and endocrinologic features are highly variable. Thus, success of treatment is likewise variable, ranging from recurrence of symptoms shortly after termination of treatment to spontaneous cure[9,16]. Due to the interaction of genetic and environmental/ behavioural factors contributing to its pathogenesis, PCOS is an interesting model to study the old and still unresolved question of nature-nurture dichotomy in the realm of health and disease. Diseases usually result from webs of interacting causes of enormous complexity[17], however, in most instances, programs of research tend to emphasise a single cause. Diseases such as PCOS, which comprise so many different symptoms are clearly a medical condition but they are also psychosocial problems. The reasons to use PCOS as a model to study the psychosocial factors involved in symptom perception are as follows:

1. Fertility is an important biological function and is universal to all human beings throughout time and space, and, apart from being a biological process, reproduction among *Homo sapiens* has always had strong connections to culture and to psychosocial factors. Cultural aspects like socio-economic and socio-educational levels, nutrition, religion, tradition, weaning habits, and different psychosocial factors influence reproductive success and fertility outcome. Pathological as well as voluntary infertility, minimising reproductive success, are in contrast to the biological imperative and are expected to produce great psychosocial distress.

2. Apart from infertility, some of the other symptoms associated with PCOS (like hirsutism, obesity, and android fat patterning) may interfere with female self -perception and are in contradiction to culture dependent beauty ideals[18].

The present paper is a review of the literature on psychosocial features of patients affected with PCOS. The aims of this review are twofold. First, there is the aim to discuss psychosocial factors associated with PCOS as a whole or alternatively of the four main symptoms.. Secondly, the psychosocial consequences of bearing the full blown syndrome or alternatively one of the four symptoms are addressed.

Methods

The articles reviewed in the present paper represent a search through MEDLINE until July 2000, in addition to some other punctual papers found in other databases or libraries. The inclusion criteria adopted had to be very ample, since relatively few papers on psychosocial factors and PCOS were published. And, as stated above, papers on the bio/psychosocial factors associated with one of the four main symptoms alone without them being diagnostic of PCOS were also included.

Status of Research of the Polycystic Ovary Syndrome

Definition and epidemiology

Despite early studies of this disease the etiology and pathophysiology of the PCOS are poorly understood up to now[11]. The prevalence of the PCOS lies between 3 and 22% depending on the definition used. Diagnostic criteria include a wide spectrum of clinical phenotypes, ranging from women with anovulatory regular menstrual cycles to hirsute, obese, oligo-

amenorrhoeic infertile women[19]. More recently, this syndrome was characterised by chronic anovulation and some evidence of androgen excess[20], leading to a prevalence of about 5%[21]. This definition reflects the consensus of experts, however, no single criterion is endorsed as definite[20]. Although the polycystic appearance of the ovaries was used as diagnostic criterion for PCOS in the past, this morphological feature is no longer universally accepted because of its non-specificity[22,23]. Indeed, it can also be found as a secondary consequence of other conditions such as late onset adrenal 21-hydroxylase deficiency, adrenal or ovarian androgen secreting tumors, syndromes of extreme insulin resistance, as well as Cushing's syndrome and acromegaly[24]. However, it can also be diagnosed among healthy women. Altogether, as much as 22% of the female population have polycystic ovaries[8], but only 3–10% of them can be classified as affected with the PCOS[13]. It is important to note that women with PCO morphology and no other symptoms have similar fertility in comparison to normal circulating controls[24]. This raises the issue whether the polycystic morphology is a normal biological variation or the very mild end of the wide spectrum of PCOS[19,24,25].

Hormonal levels

PCOS is also referred to as an endocrine disorder characterised by hyperandrogenism, although no specific androgen pattern is predictive of PCOS. For example, as much as 30–50% of women with PCOS have normal testosterone levels[26]. Women with PCOS tend also to show high LH/FSH ratios and an increase in the circadian frequency of LH pulses in comparison to healthy controls, however, controversy exists whether these alterations represent a primary or secondary defect[4]. Additionally, the levels of prolactin[26], and growth factors[25] may also be altered.

Weight status, body composition, fat distribution

From the first description of the syndrome, obesity was recognised in at least half of the affected patients. More than 60 years later, the cause of obesity associated with PCOS remains unclear. The association of obesity and PCOS is as follows: The percentage of obesity among women affected with PCOS varies significantly even between westernised countries, for example 38%–88%[19] reflecting genetic as well as environmental influences. However, higher body mass indices (>24.99) at age 18 work as a predictor for later anovulatory infertility[15]. PCOS affected women show a typical android kind of fat patterning (high waist/hip ratio) in consequence of higher total androgen levels[27]. This is a typical sign of infertile or postreproductive phases in female life[28,29], being also observed during pregnancy and in obese young women whose potential reproductive success is diminished[30]. Furthermore, obesity exacerbates the underlying insulin-resistance in already established PCOS[31], and is linked to increased androgen production, hirsutism and infertility[19].

Genetic factors

The possibility that PCOS is genetically determined has been suggested for over 40 years[13]. The pattern of inheritance suggested was either autosomal dominant[13,32] or X-linked dominant[33], depending on the criteria used to establish the phenotype. More recent results suggest genetic heterogeneity[34], what is not unexpected, since the prevalence of PCOS and its associated symptoms vary quite substantially among different populations[35,36]. Most authors acknowledge strong environmental factors in addition to the genetic predisposition[37].

PCOS as general risk factor

Apart from representing a complex disorder in itself, PCOS predisposes for different severe disease risks, such as type II diabetes mellitus, dyslipedemia, cardiovascular diseases, hypertension, gestational diabetes and pregnancy-induced hypertension[38]. Higher risks for endometrial and ovarian cancer[38] are also often referred to by clinicians, despite its controversy. Recent research suggests that insulin-resistant PCOS occurs in most hyperandrogenic obese women and causes higher metabolic renal, and cardiovascular risks as compared to nonhyperinsulinemic PCOS[39].

Psychosocial Factors of PCOS and of its Main Symptoms

There are only a few reports on the psychosocial aspects of PCOS affected women. Therefore the following will also review the psychosocial factors associated with each of the main symptoms of PCOS separately.

PCOS in general

The older literature on psychosocial factors associated with PCOS is rare and tends to be psychoanalytic only[9,40] however a psychoanalytic approach does not reflect the psychosocial problematic of PCOS in a sufficient manner. From a more psychophysiological point of view, Lobo et al [23] studied norepinephrine metabolites, platelet serotonin, adrenal androgens and psychological stress in 23 women with PCOS, 10 with hypothalamic-pituitary dysfunction and 25 controls. In comparison to the controls, PCOS patients scored significantly higher in the modified Life Events Inventory and also showed a significantly greater mean number of Major Life Events. It is suggested that psychosocial stress may be implicated in the chronic anovulation and hyperandrogenism of PCOS, although the data do not permit any causative relation[23]. Also from a more neurophysiological point of view the association between an aberrant puberty and the development of PCOS was discussed by Mechanick & Futterweit[41]. According to their hypothesis, abnormal neural development in the brain decreases the hypophyseal set point for ovarian hormone feedback, elevating LH. The inappropriate gonadotropin secretion is maintained by ovarian hyperandrogenemia, which in association with arrested follicle maturation results in anovulation. A recent study supports the view that an abnormally premature adrenarche appears to be an early sign for PCOS[42]. This, in turn, can be interpreted as an aberrant puberty as postulated earlier by Mechanik & Futterweit[41], although the underlying mechanism possibly is different and psychosocial aspects are not sufficiently discussed.

Only two papers could be found on psychiatric morbidity and PCOS[43,44], but psychosocial factors are not considered. A recent paper suggests that women with PCOS do not cope with experimentally induced stress as well as do controls[45], suggesting that distress may affect them more substantially. Another psychosocial or psychosocial component of PCOS was discussed in three papers which report a higher rate of PCOS among female-to-male transsexuals than in the general female population[46–48].

Although studies focusing on psychosocial aspects of PCOS are rare, the great majority of experts acknowledge more or less heavy psychosocial burden secondary to this disorder. Since the scarcity on bio/psychosocial data on PCOS affected women does not permit a greater insight into this issue, the following will review the bio/psychosocial aspects related to the main symptoms associated with this syndrome (menstrual irregularity, infertility, hirsutism and obesity), but which not necessarily include data on PCOS patients.

Menstrual irregularity

Menstrual irregularity is a relatively frequent complaint in the gynecological clinic, which can be easily overcome in many cases. Despite the fact that menstrual symptomatology has received much attention in recent years, little research was carried out to disclose patterns of its interplay with psychosocial factors, although they are suggested to play important roles in the recognition, evaluation, and expression of these symptoms[49]. It is well established that strenuous physical exercise can lead to changes in characteristics of the menstrual cycle, apparently through alterations of the pulsatile release of GnRH[50]. In addition, moderate stress, may increase the probability of long menstrual cycles in susceptible individuals[51]. A recent study[52] revealed lowered fecundability among highly distressed women with long menstrual cycles (>35 days), whereas the fecundability of women with normal cycle lengths were not affected by distress. Therefore it was concluded that psychological distress might be a risk factor for reduced fertility among women with long menstrual cycles[52].

Infertility

As already stated, infertility worries 20% of western couples[1]. Prevalence of current infertility varies from 3.6–14.3% and lifetime prevalence of infertility from 12.5–32.6%[1]. When considering the mean number of children per women, it is clear that some populations differ significantly from others. In most of the cases these differences are due to socio-educational factors: women in first-world countries tend to have two children at most, whereas those from underdeveloped countries have in general more than four[53]. However, when considering infertility as a pathological symptom, 2 to 32% of the women in countries like Brazil and Gabon[53] have primary infertility due to reproductive tract infections and sexually transmitted diseases. Traditional groups, like the!Kung of Southern Africa and rural populations of Ethiopia are also reported to have high rates of infertility, due not only to infectious diseases, but also to ecological factors[54,55].

Besides these, it has for long time been acknowledged that fertility is highly variable and subject to the most different factors. Besides endogenous steroids, ovarian function, nutrition, diet, age and development[56], also psychosocial factors do influence fertility. Stress and other psychosocial factors as cause for infertility are being discussed for decades. To explain why rates of reproductive failure reach 50% of all conceptions among humans and similar proportions among the majority of mammals, Wasser & Barash[57] developed the Reproductive Filtering Model. They argue that the high reproductive costs have selected physiological mechanisms that terminate reproductive attempts when the probability of viable offspring is low. This implies that the reproductive system has evolved a high physiological responsiveness to environmental change[58].

Indeed, several findings suggest that psychosocial distress does contribute to the etiology of reproductive failure[59,60]. Infertile women show higher psychosocial distress than controls[61]. However, the hypothesis that psychosocial distress triggers infertility received little support until the late eighties because only a relatively small percentage of infertile persons show clinically significant distress rates prior to infertility[61] and even during fertility treatment[62,63]. It seems out of question that infertility causes psychosocial distress, however, there are some reports on the surprising normality of psychosocial factors in couples undergoing fertility treatment[62–64]. Furthermore it has to be stated, that not only psychosocial distress triggers infertility but

infertility triggers psychosocial problems. Several studies found no explicable differences between infertile and fertile women on stress-markers or psychological tests for neuroticism, anxiety or social adjustment[65,66]. According to this results, contrary to what many affected women believe and hope neither adoption nor other stress reducing procedures or activities increase the chance to become pregnant[67]. The emotional problems of infertile couples are associated with being infertile but not causes infertility[67–70].

For many affected couples infertility means a life crisis and a toll in the quality of their life[71]. The psychosocial problems arisen following infertility are most often reported to be distress, depression, anxiety, sexual problems, marital and social disadjustment, loss of control, and lowered self esteem[62,72–76]. The psychological symptoms, as well as anxiety and depression scores in infertile women are similar to those associated with serious medical disorders like cancer, cardiac rehabilitation and hypertension[77,78]. This, however, does not mean that psychosocial distress, depression, anxiety or even obsessive-compulsive behaviour necessarily reach clinical significance in couples treated for infertility[62,75]. Nevertheless, the probability of conception is lower in women with a high trait anxiety[79,80] and furthermore, stress may influence the outcome of infertility treatment[80,81]. It is speculated that personality characteristic determine how women experience and react to the stress of infertility, and that these psychological and endocrinological differences could influence their probability of conception. Indeed, a recent paper suggests that women with PCOS do not cope with experimentally induced stress as well as do controls[45].

In summary, authors continue to investigate if psychosocial distress triggers infertility, since it seems well established that infertility triggers psychosocial distress and that there is a bi-directional association of both. However, despite the growing support of the idea that only subtle psychosocial distress and slight hormonal dysfunctions alter fertility in humans and in some animals – where, for example, stress is associated to fetal resorption in mammals[82,83] – the underlying mechanisms remain unknown[52,80].

Hirsutism

Hirsutism, the excessive hair growth in women following a male distribution pattern, usually results from a combination of increased androgen production and increased skin sensitivity to androgens[84]. It is well known that the degree of hirsutism varies quite markedly with ethnicity. Later work focuses more on the underlying physiology of hirsutism, its association with infertility, and on differential frequency of hirsutism in fertile women of different ethnicity[85]. Hirsutism, although not considered a disease, is a common problem that may be presented to clinicians or not depending on cultural factors and ethnicity[86]. However, hirsutism is often one of the complaints made by patients affected with PCOS. Although cosmetic and psychosexual consequences of hirsutism are recognised by some researchers to cause profound distress in affected persons[7,84,87], only very few studies are aimed at evaluating the psychosocial factors correlated with it. Some older investigations noted a period of emotional stress prior to the onset of hair growth increment[88], various psychological symptoms including insecurity with respect to the female sexual role[89], high levels of sexual dysfunction[90] and anxiety[91]. However, treatment with benzodiazepines did not alter hirsutism[92] and psychiatric illnesses were excluded in a sample of 30 hirsute women[93]. A more recent study reports that affected women show significant higher social fear, anxiety and psychotic symptoms

than controls, whereas depression, somatisation and anger-hostility are not significantly different from controls[7]. Another study's conclusion is that depression in hirsute women is significantly associated with free and biologically active testosterone, suggesting it to be caused rather by deranged neuroendocrine mechanisms than by psychosocial factors[94]. Thus, it seems clear that much more studies are needed to understand the psycho-endocrine and psychosocial causes and consequences of hirsutism.

Overweight and obesity

The prevalence of obesity is increasing rapidly especially in western societies. Almost 40% of North-American adult women are obese; a proportion that assumes epidemic dimensions[95]. Obesity is one of the typical diseases where genetic as well as environmental factors play key roles. As such it is also linked to PCOS, however, affecting only a part of the patients. Two of the obesity genes seem to be related to reproductive functions. The gene determining body weight homeostasis-lep-[96] encodes the protein leptin. Apart from being called a »satiety« gene it seems to be linked with ovarian function, being able to impair estradiol synthesis, and suggesting that leptin may indicate whether somatic fat stores are sufficient for growth and reproduction[15,95]. It is known for long that women with very low fat proportion, such as anorexics, athletes and women who practice stringent weight control, show menstrual irregularities as well as reproductive failures[50]. On the other extreme, high body weights are also associated with menstrual irregularity[97,98]. The fact that some of the obesity genes are involved with reproductive functions is expected, since the adipose tissue is the most important site of extra-ovarian and placental estrogen biosynthesis. There are studies reporting the association of obesity and infertility[19,99] and others where this association was not found. Several mechanisms are possible for the effect of weight on fertility since weigh loss reverses the pattern of depressed sex hormone-binding globulin, elevated free androgens, and exaggerated insulin response[100].

The association of obesity and PCOS is complex as stated above and new research propose that there are three types of disorders relating obesity, androgens, insulin and PCOS: simple nonhyperandrogenic obesity, typical nonhyperinsulinemic PCOS and insulin-resistant PCOS[39]. Whether these represent separate genetic disorders remains to be elucidated. Apart from the genetic predisposition leading to obesity, it is well established that high BMIs (usually considered to be BMI > 25kg/m^2) lead to significant health hazards. The most common medical complication arisen secondary to obesity are increased risks for metabolic syndrome, osteoarthritis, gout, sleep apnoea, dysfunction uterine bleeding and endometrial carcinoma[95]. Especially high waist-hip-ratios have shown a better predictive power for various forms of health problems than classical BMI[101]. A high waist to hip ratio, visible as android fat patterning is considered as unattractive and in contrast to female beauty ideals independent of cultural background. From an evolutionary point of view the association between fertility and nutritional status or fat mass can be seen as an adaptation to periods of famine and climatic upheaval, being referred to as the »thrifty gene« hypothesis[102]. Not only the reproductive system has evolved a high physiologic responsiveness to environmental change, the homeostasis of energy expenditure and energy storage must also be prone to intense environmental modification.

From corpulent, well nourished women with pink cheeks, as pictured by Peter Paul Rubens, the female beauty ideal

changed during the last centuries of western civilisation to extreme thin women, as personified by the model Twiggy. Already this changes of the ideals of body shape points towards its sensitivity to cultural and environmental influences. The social qualification of obesity does not only vary from time to time, but also from place to place, and even from subgroup to subgroup sharing the same cultural setting. For example, there is a negative association of socioeconomic status and obesity in modern societies, which is in contrast with the direct association of wealth and fatness in some traditional cultures[103,104]. This is to say that culture has a very strong influence on weight[105].

Apart from genetic factors, health hazards, and cultural influences, several psychosocial consequences also affect obese patients. The intensity of these psychosocial aspects is reflected by the massive consumption of the most different commercially available diets and slimming programs. Apart from the fact that in some cultures, higher BMIs are associated to well-being[103], negative stereotypes of obesity have been found among Australian, Black, Japanese, Puerto Rican and Anglo-American ethnic groups[105]. Impaired psychosocial function in the obese is manifested as social isolation, loss of job mobility, increased employee absenteeism, economic and social discrimination and lowered self esteem[101,106,107]. This, in turn, is associated with downward social mobility and lower levels of socio-economic attainment, negatively affecting the patient's quality of life, through impairment of several physical, psychological and social factors[108]. There seems to be a vicious cycle where obesity is associated to depression, depression leading to enhanced eating disorders that further strengthen depressive feelings[10]. Besides the fact that women are more often obese than men, which probably is due to the hormonal fluctuations linked to weight gain during pregnancy and in the menopause transition[15,109], obese females report to have a lower quality of life than obese men[110]. This, the fact that beauty ideals of thinness apply more to females than males[111], and a greater susceptibility to anxiety and depression among females[110] may explain these gender differences[15].

Apart form obese patients, subjects affected with the insulin resistance syndrome are also prone to psychosocial distress. A population study of men in management positions found that psychosocial stress correlated closely with the risk factors comprising the insulin resistance syndrome[112]. This supports the idea that although genetic predisposition may play an important role in the development of this syndrome, environmental factors are necessary or may even be of major importance. The authors conclude that the findings of their study stress the importance of further investigations of the role of stress, personality and behavioural factors in metabolic alterations as a whole[112].

As seen above, symptoms like menstrual irregularity, infertility, hirsutism and obesity, in association and especially each on its own may have a profound impact on a woman's quality of life. Some of these symptoms may be caused by genetic as well as environmental factors, but all do cause psychological distress that may threaten feminine identity, alter self-perception and family dynamics.

Discussion

The studies published so far are inconclusive about psychosocial causes leading to PCOS, although universal consensus exists on more or less severe psychosocial distress as consequence of PCOS. The main reason for this inconclusiveness relies on the fact that only very few reports were found on this issue. However, when

analysing the vast literature on each of the symptoms on their own, it seems as if psychosocial factors not only are a more or less heavy burden consequential to the clinical manifestations, such as infertility, but may also, at least in some instances, contribute to their etiology.

What seems clear through part I of this paper, is that genetic factors do seem to play an important role in the etiology of PCOS, although it is far from established how many, and which genes are involved. It seems more likely that PCOS is a complex trait with multifactorial inheritance. This means that there are probably some key genes that in complex association with each other, with some minor genes as well as with environmental factors contribute to this intricate and heterogeneous disease.

The environmental factors most often cited to contribute to the etiology of PCOS are nutrition and diet. Other environmental factors like a sedentary life style may contribute in a minor way. Obesity, especially in adolescence is predictive of menstrual irregularities, reproductive failures as well as PCOS. Furthermore, it is well established that diet and nutrition in the form of weight gain shape the course of progression of PCOS. On the other hand, weight loss and exercises in obese, infertile PCOS women significantly ameliorate menstrual cyclicity, ovulation and pregnancy frequency in comparison to healthy controls[113]. This success may in part be due to ongoing support gained from clinic staff and other affected women joining a special support group for infertility, and the relatively short-term goal of achieving a pregnancy[114], thus suggesting psychosocial support to have strong influences in the amelioration of some of the PCOS related symptoms.

Since it is consensual that symptoms like menstrual irregularity, infertility, hirsutism and obesity trigger psychosocial distress, only the evidences in favour or against psychosocial factors contributing to the etiology of these symptoms will be further discussed.

Menstrual irregularity can be a consequence of intense psychosocial distress as evidenced by amenorrhoea among women kept in concentration camps, prisons and alike. It is also consensual that intense physical stress leads to menstrual irregularities, as exemplified by athletes. On the other hand, very low fat proportion as observed in anorexic patients with all their behavioural and personality problems also grossly alter menstruation. Thus, it seems that psychosocial distress does lead to menstrual irregularity.

Infertility is, among the four symptoms studied, the one that received most attention in the past literature. Although the number of papers on the psychosocial aspects related to infertility is huge, the issue whether psychosocial distress does contribute to infertility or not is still unresolved. The review by Wright et al.[61] indicated that this hypothesis received the least support, whereas the hypothesis on psychosocial factors as consequences of infertility as well as the hypothesis on the interconnection of psychosocial factors and infertility seemed the most probable. Since that time research on this topic continues, and, contrary to expectations, there are some recent studies supporting the idea that psychosocial distress does contribute to the etiology of infertility. However, this newer research points to more subtle psychosocial as well as hormonal desequilibria being capable of interfering with fertility. Newton et al.[115] recently developed an inventory that measures *perceived* infertility related stress, rather than the intensity of stressful events associated with infertility. On the other side, different degrees and types of psychosocial reaction are frequent among infertile persons, this distress may in turn still exacerbate infertil-

ity. Here it is important to note that very few papers do attribute different degrees of infertility to their patients. Guzik[116] claims that the infertility tests used most often do not really discriminate between infertile and fertile populations. Therefore the former question whether psychosocial distress triggers infertility should now be addressed in a different way: does the intensity of the perceived stress rather than the intensity of the stress event itself trigger infertility? The answer seems to be: yes. However, what the underlying factors are that contribute to the development of these differential responses towards stress still awaits further investigation, being one of the hypotheses to be testes that of genetic predisposition.

Only very few papers on psychosocial aspects of hirsutism have been found. Among them, some quite old studies suggested an increase in hirsutism after stressful events. However, newer research seems not to address this question anymore – so this remains utterly inconclusive. However, some work has been carried out on the psychosocial consequences of hirsutism, where it seems clear that hirsutism leads to distress negatively affecting the women's quality of life.

Finally, psychosocial factors associated with obesity have received much attention in the recent years, since obesity is rapidly increasing in affluent countries, assuming epidemic dimensions. Although much research confirmed that obesity could have serious psychosocial consequences (depending on the degree of obesity as well as on the cultural context), it is not clear whether psychosocial distress can lead to the development of obesity. What seems established however, is that the psychosocial consequences of obesity often lead to an increase of al-

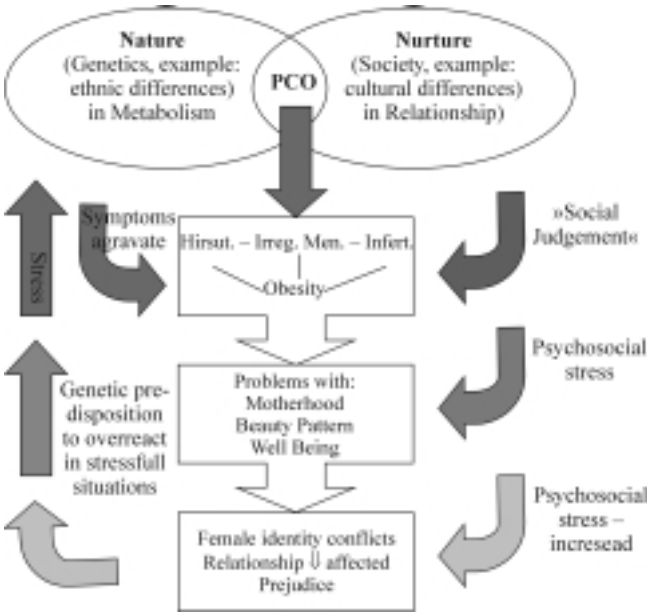

Fig. 1. Genetic, psychosocial factors and stress as vicious circle aggravating main symptoms in PCO.

ready installed overweight, thus representing a vicious cycle. It must not be forgotten, nevertheless, that about half of PCOS patients are non-obese.

From many recent endocrinological studies, it is clear that insulin resistance seems to play a key role in the development of PCOS. Insulin resistance would trigger hyperandrogenism as well as obesity leading finally to PCOS. However, it must be kept in mind that a part of the women affected with PCOS are non-insulin resistant. Although genetic predisposition accounts for the insulin resistance syndrome, psychosocial distress seems to also be a very important factor in its etiology, stressing the importance of further investigations of the role of stress and personality in other metabolic diseases. In conclusion, we would like to present the following model (represented in Figure 1) of the influence of genetic and psychosocial factors on PCOS.

Due to the fact that psychosocial consequences of PCOS and especially some of its associated symptoms, like infertility and obesity, are accepted almost universally, psychosocial support assumes an important role in the management of the affected patients. This should not mean, that medical treatment of PCOS is not necessary but an intensive collaboration between medical treatment and psychosocial support would improve the situation PCOS affected women.

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SINDROM POLICISTIČNIH JAJNIKA: MEDICINSKO STANJE ALI I VAŽAN PSIHOLOŠKI PROBLEM

S A Ž E T A K

Sindrom policističnih jajnika, vodeći uzrok neplodnosti uslijed izostanka ovulacije prisutan kod petine žena, je kompleksna kronična bolest s genetičkom i okolišnom komponentom, no još uvijek nejasne etiologije. Pored neplodnosti, sindrom policističnih jajnika izaziva menstrualne disfunkcije, hirzutizam i simptome pretilosti koji mogu biti uzrokom ozbiljnih psiho-socijalnih tegoba. U ovom smo radu dali pregled etiologije i simptoma sindroma policističnih jajnika koji nije samo vrsta bolesti koju je potrebno medicinski tretirati već i psiho-socijalni problem oboljelim ženama. Sindrom policističnih jajnika nije ko-induciran psiho-socijalnim čimbenicima već su njegovi glavni simptomi – neplodnost, menstrualne disfunkcije, hirzutizam i pretilost – uzroci povećanog psiho-socijalnog stresa.