Infertility caused by PCOS—health-related quality of life among Austrian and Moslem immigrant women in Austria

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BACKGROUND: The polycystic ovarian syndrome (PCOS) is the most common endocrine disorder affecting female fertility. In this study, we examined the symptomatology of PCOS and the health-related quality of life among infertility patients suffering from PCOS with different socio-cultural and ethnic background. METHODS: Symptomatology of PCOS, body composition characteristics as well as socio-economic factors were examined in 49 PCOS infertility patients of the University Clinic for Gynecology and Obstetrics, in Vienna, who originated from two socio-cultural subgroups, Austrian women and Moslem immigrant women. Additionally, the Cronins health-related quality of life questionnaire of women with PCOS was used in order to examine the impact of PCOS symptoms on the individual quality of life of the affected women. RESULTS: In terms of the appearance of the symptoms, the typical heterogeneity of PCOS could be found in both subgroups with no differences. However, differences in the health-related quality of life were impressive. Health-related quality of life of women from an Islamic background was affected to a greater degree than that of Austrian women, although no differences in symptomatology were found. This was true of all five domains investigated (infertility, overweight, hirsutism, menstrual irregularities and emotional problems). First of all, infertility was a dramatic problem for immigrant women. Islamic women had very high reproductive pressure. The Moslem immigrant PCOS women suffer more from infertility than do Austrian women. CONCLUSIONS: Health professionals should be sensitive to the ethnicity, religious and cultural background of their patients to provide the best possible medical support.

Key words: ethnicity/infertility/Moslem immigrants/polycystic ovarian syndrome/socio-cultural aspects

Introduction

Today, infertility affects at least 12% of couples worldwide (Fishel et al., 2000; Reproductive Health Outlook, 2002). For the affected couples, infertility has profound social and personal implications resulting in a decreased sense of well-being. According to the results of several medical anthropological studies carried out during the last decade (Feldman-Savelsberg, 1994; Inhorn, 1994, 2003; Inhorn and Buss, 1994; Ericksen and Brunette, 1996; Nahar et al., 2000; Fido, 2004), these social and personal implications are strongly associated with the cultural and/or religious background of the affected women. Particular psychosocial problems may result from fertility disorders such as polycystic ovary syndrome (PCOS) which show a wide range of possible symptoms, all of them affecting female identity (Eggers and Kirchengast, 2001). PCOS is the most common endocrine disorder affecting female fertility (Homburg, 1996; Kousta et al., 1999; Balen and Michelmore, 2002), originally described as early as 1935 (Stein and Leventhal, 1935) and since then the subject of extensive analyses, although its aetiology and pathophysiology are poorly understood even now (Franks, 1989, 1995; Balen, 1999). Previous research on PCOS has been conducted within a medical or psychiatric framework, and has failed to explore women's own experience of the syndrome. With few exceptions (Hashimoto et al., 2003), analyses of the experience of women of a particular cultural background suffering from PCOS were neglected. One of the major difficulties in the analyses of PCOS is the great variability in symptoms and clinical and biological manifestations of this condition (Franks, 1995; Conway, 1996). The spectrum ranges from infertility as a result of chronic anovulation and menstrual irregularities such as amenorrhoea or oligomenorrhoea, obesity in combination with a preponderance of fat localized in the upper body region, and several dermatological features such as seborrhoea, alopecia, acne or hirsutism as a result of incessant hyperandrogenism. All these symptoms not only contribute to this heterogeneous phenotype of PCOS, but also have an important influence on the quality of life (QoL) as well as on the female identity of the affected women (Elsenbruch et al., 2003). The research evidence suggests that women with PCOS experience considerable stress related to their symptoms. Studies of women with, from whatever cause, hirsutism, obesity, amenorrhoea and infertility (all of which feature among the common

symptoms of PCOS), show considerable distress and anxiety related to their failure to conform to idealized 'feminine' norms of appearance and behaviour (Wright *et al.*, 1991; Sarlio-Lähteenkorva *et al.*, 1993; Sonino *et al.*, 1993; van Balen and Gerrits, 2001; Kitzinger and Willmott, 2002). The problem of infertility in particular causes psychosocial distress. For many affected couples, and more intensely for women than for men (Wright *et al.*, 1991), infertility means a life crisis and a toll on their QoL (van Balen and Gerrits, 2001). The psychosocial problems arising following infertility are most often reported to be distress, depression, anxiety, sexual problems, marital and social maladjustment, loss of control and lowered self-esteem (Menning, 1982; Keye, 1984; Lalos *et al.*, 1985; Daniluk, 1988; Tarlatzis *et al.*, 1993; Hirsch and Hirsch, 1995). The psychological symptoms as well as the anxiety and depression scores in infertile women are similar to those in medical disorders such as cancer, cardiac rehabilitation and hypertension (Domar *et al.*, 1993; Sanders and Bruce, 1997).

PCOS can be observed in women of different ethnic origin all over the world. It is estimated that up to 20% of women (Polson *et al.*, 1988) may be affected by PCOS, but not all display symptoms, seek medical assistance or are accurately diagnosed. However, literature about how women with different cultural background are affected in terms of their QoL or female identity due to suffering from PCOS is rare (Hashimoto *et al.*, 2003). The perception of PCOS and its symptoms is embodied in complex cultural systems of beliefs, values and ideals. The increasing number of immigrant women contacting infertility clinics in Europe makes a profound analysis of the impact of cultural and religious factors on PCOS symptom perception necessary. During the last decades, migration from Islamic countries such as Turkey, but also middle eastern countries such as Pakistan, to Central Europe increased, leading to special problems for infertile Islamic women who consulted European infertility clinics (Zurayk *et al.*, 1997). In this study, we focused on women who suffered from PCOS and sought medical assistance for infertility at an Austrian university clinic. Beside Austrian women, many women with an Islamic/Moslem background, who immigrated with their families to Austria, contacted the infertility out-patient department of the Viennese University Clinic for Gynecology and Obstetrics. Therefore, the aim of the present study was to analyse the impact of ethnic/cultural background on perception of PCOS symptoms and, above all, infertility.

Subjects and methods

The study was carried out between May 2001 and April 2002 at the University Clinic for Gynecology and Obstetrics, Department of Endocrinology and Reproduction, in Vienna, Austria. The study population consisted of 49 women aged between 18 and 39 years (mean 28.27; SD 5.35) with PCOS, who had never given birth up to the time of the present investigation. The presence of polycystic ovaries was determined using the following criteria: the sonographic ultrasound picture shows ≥ 10 cysts from 2 to 10 mm in diameter distributed evenly around the ovarian periphery with an increased amount of stroma (Adams *et al.*, 1985). PCOS was defined as the presence of polycystic ovaries on ultrasound plus one additional feature including: menstrual irregularities, infertility, acne, hirsutism, body mass index (BMI) >25 kg/m^2, raised serum testosterone (<0.86 ng/ml), raised LH (>13 mU/ml) or an LH/FSH ratio >2 (28, 29, 30, 31). All women contacted the Department of Endocrinology and Reproduction because of undesirable infertility (i.e. no pregnancy after 6 months to 1 year of unprotected sexual intercourse). Besides their usual examination (including hormone status), an extensive body composition analysis was carried out and a questionnaire was filled in.

Stature and BMI

Stature (in m) and body weight (in kg) were determined for each proband (Knußmann, 1988). For a better description of the weight status, the BMI was calculated as: weight in kilograms divided by the square of height in metres. Weight status was classified using the following BMI categories according to the World Health Organization (1995): thin = BMI <18.50; normal range = BMI $18.50-25.00$; overweight = BMI >25.00.

Body composition

All body composition analyses were performed in the University Clinic of Radiology. Dual-energy X-ray absorptiometry (DEXA; Hologic 4000) was used to measure bone, lean and fat mass (Blake and Fogelmann, 1997).

Body fat distribution

For a better description of the sex-specific body fat distribution, the waist to hip ratio (WHR) as well as the fat distribution index (FDI) were calculated: WHR = waist girth (in cm)/hip girth (in cm). A WHR value ≥ 0.8 was defined as an android or male fat distribution; a WHR value <0.8 was interpreted as the gynoid or female body fat distribution (Lefebvre *et al.*, 1997). The FDI was calculated as follows: FDI = upper body fat mass in kg/lower body fat mass in kg. A fat distribution index <0.9 indicates a gynoid fat distribution, i.e. the fat mass of the lower body surpassed the fat mass of the upper body. A FDI >1.1 defines an android fat distribution, i.e. the amount of fat tissue of the abdominal region surpasses the fat mass of the lower body. An FDI between 0.9 and 1.1 is classified as an intermediate stage of fat distribution (Kirchengast *et al.*, 1997; Kirchengast and Huber, 2001).

Hormonal levels

The following hormones were examined: FSH, LH, 17β-estradiol (E$_2$), progesterone, prolactin, testosterone, androstendione, dehydro-epiandrosterone sulphate (DHEA-S) and sex hormone-binding globulin (SHBG). All the examined blood samples were collected at the beginning of the infertility therapy when the PCOS women were not taking any medications. Quantitative determination of the hormone levels was carried out at the central hormone laboratory of the Viennese University clinic.

Procedure

All women with diagnosed PCOS consulting the infertility out-patient department were asked to participate in the present study, and 58% of the Austrian women and 69% of the immigrant women who were asked, refused to participate. Therefore, we have to be aware that this sample represents a highly selected group of women and therefore the interpretation of the results is limited. After the extensive medical examination, including body composition analyses and hormonal status, all women suffering from PCOS were given a questionnaire. Women suffering from other endocrine

disorders such as thyroid dysfunction, Cushing's disease, hyper-prolactinaemia or diabetes were excluded from further analyses. Two women whose German was very poor completed the questionnaire together with an interpreter who could translate all the questions correctly. It took ~20–30 min to fill in the whole questionnaire. Information on the following factors was collected with the help of the questionnaire.

Socio-demographic and lifestyle factors

The age, nationality, birthplace, mother tongue, religion, time since migration to Austria, education, profession, occupation, number of brothers and sisters, and marital status of the examined PCOS women were ascertained. Also some lifestyle factors such as smoking habits, alcohol consumption or sporting activities were determined. Information regarding birthplace, mother tongue and religion were used to define two subsamples (see below). Education and profession were used as indicators of social class. In the present study, only the influence of socio-cultural (religious) background on health-related QoL was analysed.

Menstrual history

Menstrual factors such as cycle length (minimum/maximum), cycle irregularities, the duration of menstrual bleeding or the absence of bleeding without being pregnant were examined. Also, questions regarding premenstrual or menstrual pains were put to the PCOS women.

Health-related quality of life

In order to analyse the individual QoL in the affected women, Cronins health-related QoL questionnaire was used (Cronin *et al.*, 1998). This questionnaire was developed to measure the individual QoL in affected women. According to Cronin *et al.*, the assessment of the health-related QoL may add vital information to the evaluation of treatment effectiveness and so may lead to an optimal treatment of each affected woman. For the development of this questionnaire, a pool of 182 items which are potentially relevant for women suffering from PCOS were identified in semi-structured interviews with PCOS patients, a survey of health professionals working closely with PCOS women and a literature review. Five factor groups were defined: emotions (psychological problems, depression), hirsutism (indicators of hyperandrogenaemia), body weight (overweight fat patterning), menstrual problems (amenorrhoea, oligomenorrhea) and infertility. The complete questionnaire contains 26 questions regarding the five factor groups. For a more extensive description of the development of the questionnaire, see the original paper (Cronin *et al.*, 1998). The questions are answered by the PCOS patients on a 7-item Likert scale [from 'no problem' (1) to 'extreme problem' (7)]. According to recent studies (Jones *et al.*, 2004), the questionnaire represents a reliable instrument for measuring the health-related QoL in women with PCOS. However, the validity of the questionnaire could be improved by incorporating a dimension relating to acne into the instrument (Jones *et al.*, 2004).

Socio-cultural and ethnic subgroups

According to the socio-demographic factors (nationality, birthplace, mother tongue, religion and time since migration to Austria), the PCOS women were divided into two socio-cultural and ethnic subgroups: so-called Austrian women, and immigrants with a Moslem/Islamic cultural background originating predominantly from Turkey and the near East. Socio-cultural background was linked to religion, in this study having grown up as a Muslim versus as a Christian (or Roman Catholic). There were 35 Austrian and 14 Moslem immigrant women. Austrian women were nearly exclusively of Austrian origin. Only a few women were born in neighbouring countries such as the Czech Republic. However, these women declared themselves to be Austrian. All those women from Central Europe (Austria and neighbouring countries) had grown up in a Christian family background (97% Roman Catholic). None of the Moslem immigrant women was born in Austria and non of them considered herself as Austrian. At the time of investigation, they had been living in Austria for 3–9 years. Regarding socio-economic factors, the two groups differed in educational level and in occupation. The length of education in general was greater among the Austrian women. However, in both groups, >20% had a university entrance qualification (25% in the Austrian group and 21.4% in the immigrant group). Regarding occupation, 25% of the Austrian women declared themselves as housewives without an occupation, while this was true of 45% of the immigrant women; however, this difference may be due to differences in social and religious background. In general, the probands of both groups can be classified as middle class women in Vienna. Regarding the duration of the desire for children, there was no significant difference between the two proband groups.

Statistical analyses

The statistical analyses were carried out using SPSS Version 11.0 for Windows (Microsoft Corp.) (Bühl and Zöfel, 2001). After computing descriptive statistic (means, median, SDs, etc.), group differences were tested regarding their significance using Mann–Whitney test or χ^2-test. Furthermore, a binary logistic regression analysis was performed in order to test the impact of socio-cultural background on health-related QoL (Austrian women = 1, immigrant women = 2).

Results

PCOS symptomatology

The examined women show the typical symptoms of PCOS. Regarding the two socio-cultural subgroups, there is no difference in appearance between Austrian and immigrant women. Both groups had irregular cycles; 26.1% of the Austrian and 22.2% of the Moslem immigrant women have no menstrual bleeding without medication, and 78.6% of both groups experienced amenorrhoea for >2 months without being pregnant. Looking at the hormonal levels, both groups show an elevated LH/FSH ratio (1:1.8), mean testosterone and androstendione levels in the upper section of the normal range and elevated DHEA-S levels (see Table I). A significant difference in the hormone levels between the two socio-cultural subgroups could only be found for SHBG. The SHBG level in Austrian women was twice as high as in Moslem immigrant women. Regarding body composition and weight status, no significant differences between the two subgroups were found, although the absolute (total body fat) and relative amount of body fat (body fat %) was higher in immigrant women than in Austrian women and 66.7% of the Moslem immigrant women versus 48.0% of the Austrian women were classified as overweight (BMI >25.00). Also there was a tendency towards a higher FDI value in Moslem immigrants, indicating an intermediate and android body fat distribution (see Table I).

Cronin's health-related quality of life questionnaire for PCOS patients

In contrast to objective symptomatology, marked differences between the two proband groups were found regarding health-related QoL. In general, women from Islamic cultural backgrounds had more individual problems with all the symptoms of PCOS (Table II, Figure 1). Regarding all five domains of the Cronin score, i.e. infertility, overweight, hirsutism, menstrual irregularities and emotional problems, the immigrant women showed higher values, indicating increased personal problems with the individual symptoms. Austrian women reported that infertility is not as crippling a problem for them as it is for Moslem immigrant women. This is a highly significant difference (U-value = 128.5; $P = 0.008$). Another significant difference (U-value = 147.0; $P = 0.024$) was found in classifying the menstrual irregularities; Moslem immigrant women showed greater personal problems with cycle irregularities than Austrian women. Regarding the domain overweight, there is no difference in the classification between the two socio-cultural groups, although overweight is the second largest problem for Austrian PCOS women after infertility and the least problem for Moslem

immigrant women. Women from an Islamic background gave emotional problems and hirsutism higher scores than Austrian women, but no statistically significant difference can be found. These findings were corroborated by the results of the binary logistic regression analysis which yielded a significant impact of socio-cultural group on the problems with infertility (regression coefficient 0.15, $P < 0.03$) and menstrual disturbances (regression coefficient 0.10, $P < 0.04$).

Discussion

The symptomatology of PCOS in general causes a major reduction in the QoL of affected women (Trent *et al.*, 2002, 2003; Coeffey and Mason, 2003; Elsenbruch *et al.*, 2003). Ethnicity and socio-cultural factors may have an impact on this negative influence on QoL (Hashimoto *et al.*, 2003). However, only few data can be found on the ethnic diversity of patients with PCOS. There exist no ethnic differences in the prevalence of PCOS in women of different ethnic origin (Kousta *et al.*, 1999). In this study, no significant differences in the prevalence of the PCOS symptoms in the affected

Table I. Comparison of hormonal and somatic features of Austrian and Moslem immigrant PCOS women; Mann–Whitney test

	Cultural background								U-value
	Austrian				Moslem immigrant				
	Mean	SD	Median	Range	Mean	SD	Median	Range	
LH (mU/ml)	10.8	5.8	10.1	2.5–24.6	11.04	4.5	9.5	5.9–19	NS
FSH (mU/ml)	6.3	1.6	6.4	3.0–11.0	6.4	1.9	6.4	4.3–2.8	NS
LH/FSH ratio	1.8	0.9	1.8	0.4–3.8	1.8	0.6	1.9	0.8–10	NS
E_2 (pg/ml)	91.2	88.5	55	11–412	70.7	54.8	63	21–242	NS
Progesterone (ng/ml)	1.4	3.0	0.7	0.3–16	1.3	1.9	0.7	0.2–7.3	NS
Prolactin (ng/ml)	14.8	7.7	12.9	3.6–38	17.9	13.2	11.7	9.7–44	NS
Testosterone (ng/ml)	0.7	0.3	0.6	0.2–1.3	0.6	0.4	0.5	0.2–1.3	NS
Androstendione (ng/ml)	2.7	1.2	2.2	1.2–5.1	3.5	1.6	2.9	2.2–6.2	NS
DHEA-S (μg/ml)	2.9	0.9	2.5	1.5–4.4	3.0	1.3	2.9	1.7–4.9	NS
SHBG (nmol/l)	52.2	21.4	55.5	7.0–79.0	19.0	8.9	19.0	9.0–34.0	6.00, $P < 0.02$
Stature (cm)	164.4	5.8	164	152–174	161.8	8.2	160.0	153–175	NS.
Body weight (kg)	70.7	17.6	66.6	46.1–116	69.7	13.9	67.8	47.3–94.1	NS
BMI (kg/m²)	26.5	7.3	24.4	16.1–45.2	26.9	5.8	27.1	17.4–37.7	NS
Total body fat (kg)	25.2	11.9	23.6	13–59.9	25.6	9.0	23.7	14.8–43.2	NS
Body fat (%)	34.0	7.7	34.5	21.7–51.7	35.9	6.7	35.6	25.8–45.9	NS
WHR	0.82	0.07	0.79	0.71–0.98	0.83	0.05	0.82	0.74–0.90	NS
FDI	1.07	0.16	0.96	0.57–2.01	1.09	0.22	0.98	0.83–1.46	NS

Table II. Comparison of the ranking of the five Cronin domains which influence the quality of life of the examined Austrian and Moslem immigrant PCOS women

Cronin domains	Cultural background								U-value
	Austrian				Moslem immigrant				
	Mean	SD	Median	Range	Mean	SD	Median	Range	
Infertility	3.64	1.78	3.5	1–7	5.19	1.41	5.75	2.75–7	128.5, $P < 0.008$
Overweight	3.38	2.06	1.8	1–7	3.47	2.13	3.2	1–7	NS
Hirsutism	3.23	2.24	2.0	1–7	3.97	2.51	4.6	1–7	NS
Cycle irregularities	3.04	1.56	2.75	1–7	3.88	1.20	3.75	1.75–7	147.0, $P < 0.024$
Emotions	2.97	1.46	2.6	1–6.38	3.74	1.63	3.57	1–5.88	NS

7-item Likert scale: 1 = no problem; 7 = extreme problem; Mann–Whitney test.
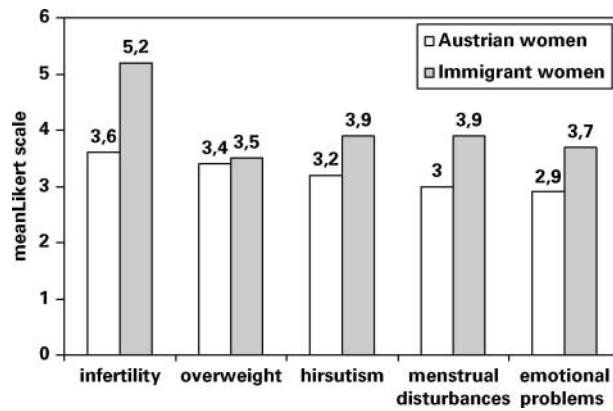
Figure 1. Influence of the Cronin domains on the quality of life.

Austrian and Moslem immigrant women could be found. All women in this sample survey were unable to conceive for the same reason, i.e. PCOS. Therefore, they are a homogeneous group of infertility patients, and a comparison of psycho-social aspects such as health-related QoL can thus be made.

First it should be mentioned that undergoing infertility therapy at an Austrian medical clinic, which certainly is demanding for everyone, is probably even more stressful for Moslem immigrant women than for European/Austrian women. Apart from all the pressure to have children from the whole family, Moslem immigrant women often do not speak German very well and need an interpreter to understand and make themselves understood correctly by the doctors. It is sometimes quite difficult for the women to give their whole medical history because these interpreters are often the husbands or other relatives such as younger sisters to whom the women will not tell all their private secrets and who perhaps do not understand what is being discussed. However, having a qualified interpreter or advocate is very important as there will be embarrassing questions and a lot of explanations (Wakely et al., 2000) during the medical examinations. Because of the strict sex segregation in Islam, Muslim women would be feeling guilty and suffer from spiritual pain if this taboo is broken (Zuraky et al., 1997). Therefore, it would be best if the vaginal examination were to be carried out by women only (Wakely et al., 2000), which is not always possible at the clinic. Because many of these religious needs are often neglected in modern Western society clinics and because of the language diffculties, the stress for women from an Islamic background undergoing medical treatments is increased compared with that of Austrian women.

Regarding the analyses of the results of Cronin's health-related QoL questionnaire (Cronin et al., 1998) for PCOS patients, it turned out that Moslem immigrant women showed greater personal problems with PCOS than Austrian women; in particular suffering from infertility makes Moslem women feel great despair. Even when infertility in Cronin's QoL questionnaire is in the first position out of all problems resulting from PCOS in both socio-cultural groups, women with an Islamic background rate it as nearly a twice as great a problem for them than Austrian women. However, it may be assumed that the Muslim immigrant women are not a

homogeneous group regarding ethnicity and migrant status, and religious values may vary among this proband group. Furthermore, it is not the aim of the present study to stereotype Muslim people. However, some socio-cultural generalizations are possible: the social pressure to have children shortly after marriage is strong in the Islamic world (Zuraky et al., 1997; Husain, 2000; Nahar et al., 2000; Guz et al., 2003; Fido, 2004). Islam unequivocally emphasizes high fertility, and Moslims believe that children are gifts from Allah and that it is their religious duty to multiply and populate the earth (Husain, 2000; Schneker, 2000). Islam requires procreation, therefore infertility is invariably a taboo (Serour et al., 1991; Wakely et al., 2000). According to Winkvist and Akhtar (2000), many Islamic Pakistani women feel strongly that their childbearing pattern influences the way people treat them; they are more respected in the family when they have children. Without children, they do not feel like a real woman (Winkvist and Akhtar, 2000; Penn and Lambert, 2002; Guz et al., 2003). Guz et al. (2003) reported that the reaction of the family and social group that Turkish infertile women are faced with plays an important role in the development of certain psychiatric symptoms.

There is also a significant difference in the perception of menstrual irregularities between Austrian and Moslem immigrant PCOS women. Islamic women say that menstrual irregularities are also quite a big problem for them, whereas Austrian women do not rate them as such a big problem. Menstrual irregularities, i.e. no regular cycle and sometimes even no menstrual bleeding without the use of medication, are strongly connected with infertility, and because infertility is a bigger problem for Moslem immigrant women, it is clear that they also rate their menstrual irregularities a bigger problem than Austrian women.

It is remarkable that Austrian women rate overweight (BMI >25) as their second largest problem after infertility, whereas Moslem immigrant women put overweight problems in the lowest ranking of the problems arising from PCOS, even though a higher percentage (66%) of immigrant women than Austrian women (48%) were affected by overweight. Furthermore, the absolute and relative amounts of body fat were higher among immigrant women (although not significant). This was also true of the FDI, indicating a higher tendency towards android fat patterning among immigrant women. Android fat pattering, indicating a higher amount of upper body fat in comparison with lower body fat, is a typical symptom of PCOS, even among lean PCOS patients (Kirchengast and Huber, 2001). It is well documented that android fat pattering is considered as unattractive among the majority of cultures listed in the human relation area files (HRAFs) (Brown, 1991). Therefore, android fat pattering is assumed to be unattractive in Western culture as well as in Islamic societies. However, although the dimension of the problem is nearly the same in both groups, i.e. they both judge overweight as a significant problem for them, overweight was the second largest problem for the Austrian women, while it was rated last in the problem ranking by the immigrant women. An extremely slender beauty ideal is typical for all Western industrialized countries and it certainly

increases the problem of overweight and obesity in women affected with PCOS. However, Moslem immigrant women not only rate menstrual irregularities and infertility but also hirsutism and emotional problems of PCOS (probably strongly linked to infertility) a bigger problem than being overweight, whereas European women only perceive their unfulfilled desire for children as a bigger personal problem.

We can see that the symptom perception of PCOS, the most common endocrine reason for female infertility, varies markedly according socio-cultural factors, although the symptomatology shows no culture-typical differences. Cultural traditions, culture-typical gender identity and religious beliefs influence the health-related QoL of PCOS patients. Distress is discussed to have a worse effect on infertility treatments and to diminish the success of reproductive medicine (van Balen and Trimbos-Kemper, 1993; Boivin, 2003; Kupka *et al.*, 2003). Therefore, health professionals in every field should be encouraged to be sensitive to the ethnicity, religious and cultural background of their patients. This sensitivity is particularly important in the area of reproductive medicine in general and in infertility in particular.

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