



Social abilities and gender roles in adolescent girls with polycystic ovary syndrome — a pilot study

Kompetencje społeczne oraz role płciowe u nastoletnich dziewcząt z zespołem policystycznych jajników — badanie pilotażowe

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Abstract

Introduction: Clinical and hormonal features of polycystic ovary syndrome (PCOS), which may be present already in adolescence, can significantly influence the psychological development and wellbeing of a young woman.

The aim of this pilot study was to determine social competence and gender roles in adolescent girls with PCOS compared to healthy peers, and to evaluate the relationship between psychological profile and clinical and hormonal components of PCOS.

Material and methods: In 28 adolescent girls with PCOS, and 12 healthy regularly menstruating girls, clinical evaluation and hormonal profile were assessed and social competence inventory (SCI) and psychological gender inventory (PGI) tests were performed.

Results: There were no significant differences in all parts of SCI in absolute numbers or in sten scores between the study and the control group. Also in PGI, in both the feminine and masculine gender schemes, the differences between the groups were statistically insignificant. In the study group, DHEAS concentration correlated positively with self presentation score ($r = 0.4$, $p = 0.03$). There was also a significant negative correlation between testosterone level and SCI score ($r = -0.5$, $p = 0.01$) as well as assertiveness score ($r = -0.5$, $p = 0.02$). No significant correlations between SCI or PGI with BMI z-score or hirsutism score were found.

Conclusions: Despite the existence of clinical and biochemical features that can influence sociopsychological condition, in adolescent girls with PCOS, social abilities and sex-typical behaviours do not seem to be disturbed. (*Endokrynol Pol* 2014; 65 (3): 189–194)

Key words: adolescent girls; polycystic ovary syndrome; gender role; social competences

Streszczenie

Wstęp: Kliniczne i hormonalne objawy zespołu policystycznych jajników (PCOS), które często ujawniają się już w okresie dojrzewania, mogą znacząco wpływać na rozwój emocjonalny i psychiczny stan zdrowia młodych dziewcząt.

Celem pracy była ocena kompetencji społecznych oraz ról płciowych u nastoletnich dziewcząt z PCOS w porównaniu do zdrowych rówieśniczek, oraz określenie zależności pomiędzy profilem psychologicznym a klinicznymi i hormonalnymi składowymi PCOS.

Materiał i metody: U 28 nastoletnich dziewcząt z PCOS oraz u 12 zdrowych, regularnie miesiączkujących dziewcząt dokonano oceny klinicznej i hormonalnej oraz przeprowadzono kwestionariusz kompetencji społecznych (KKS) i inwentarz do oceny płci psychologicznej (IPP).

Wyniki: Nie stwierdzono istotnych statystycznie różnic we wszystkich częściach KKS ocenianych w liczbach bezwzględnych oraz skali stenowej pomiędzy grupą badaną a kontrolną. Różnice pomiędzy badanymi grupami w IPP, zarówno w skali kobiecości, jak i w skali męskości, nie były istotne statystycznie. W grupie badanej stężenie DHEAS korelowało pozytywnie z kompetencjami warunkującymi efektywność zachowań w sytuacji ekspozycji społecznej ($r = 0,4$; $p = 0,03$). Stwierdzono również istotną korelację ujemną pomiędzy stężeniem testosteronu a KKS ($r = -0,5$; $p = 0,01$), jak również kompetencjami warunkującymi efektywność zachowań w sytuacjach intymnych ($r = -0,5$; $p = 0,02$).

Wnioski: Zależności pomiędzy KKS i IPP a BMI z-score i hirsutyzmem nie były statystycznie istotne. Pomimo obecności klinicznych i hormonalnych składowych PCOS, które mogą wpływać na kondycję socjopsychologiczną, u nastoletnich dziewcząt z PCOS, kompetencje społeczne oraz role płciowe wydają się być niezaburzone. (*Endokrynol Pol* 2014; 65 (3): 189–194)

Słowa kluczowe: nastoletnie dziewczęta; zespół policystycznych jajników; role płciowe; kompetencje społeczne

Introduction

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder, affecting 5–7% of women. The syndrome is characterised by irregular menses, hirsutism, acne, acanthosis nigricans, polycystic

ovarian morphology on ultrasound and elevated androgen concentration in the blood. Additionally, in women suffering from PCOS, hyperinsulinaemia, insulin resistance and type 2 diabetes mellitus, resulting mostly from overweight or obesity, are quite common. PCOS represents a range of clinical symp-



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toms, with variable degrees of severity and physical findings [1].

Due to gynaecological, endocrine and metabolic disorders, many psychological aspects of life have been found to be disturbed in women with PCOS. Clinical symptoms of PCOS and accompanying disorders, especially hirsutism, acne and excessive weight, are socially and culturally defined as unfeminine and undesirable, so women with PCOS may feel themselves to be less attractive. Increased androgen level also seems to have some impact on mood disorders [2].

Several studies have shown that PCOS has a negative impact on the quality of life of adult women but also of adolescent girls with this condition [3–7]. Jones et al. [5] found emotional and social functioning more affected than the areas of physical functioning. In the study by Coffey et al. [8], women with PCOS had a lower health-related quality of life than patients suffering from asthma, epilepsy, diabetes or back pain. The prevalence of anxiety and depressive symptoms in patients with PCOS was also higher than in the general population of women [9–14].

Clinical manifestations of PCOS may begin already around menarche [15]. This period of life is extremely important for personality development and shaping, self acceptance and social role acquiring. Symptoms of PCOS may therefore significantly influence psychological wellbeing and health-related quality of life in a young woman [16].

The aim of this pilot study was to determine the social competence and gender roles in adolescent girls with PCOS and compare it to regularly menstruating, non-hirsute peers as well as to evaluate the relationship between psychological profile and clinical and hormonal components of PCOS.

Material and methods

Patients were recruited from the Department of Paediatrics, Paediatric Endocrinology and Diabetes of the Medical University of Silesia from among the girls who sought help for menstrual disorders or/and excessive body hair. Twenty eight consecutive adolescent girls with PCOS who agreed to participate were included in the study. The refusal rate was 3.6% ($n = 1$) among the PCOS group and 16.7% ($n = 2$) among the healthy girls. The exclusion criteria were: abnormal thyroid function, hyperprolactinaemia, congenital adrenal hyperplasia (based on basal 17-OH progesterone level < 3.0 ng/mL), use in last three months of medications known to influence sex steroids, as well as any known psychological disorders. Twelve healthy, matched for age and BMI, regularly menstruating girls with no clinical signs of hirsutism served as controls. They were recruited from

among the patients of the Metabolic Clinic referred for evaluation of lipid profile disturbances in whom hormonal imbalances had been excluded. The study was conducted according to the Helsinki Declaration and approved by the Ethics Committee of the Medical University of Silesia; informed consent was obtained from each subject or/and parent or guardian.

In all participants, menstrual disturbances were evaluated and oligomenorrhea was defined as menstrual cycles longer than 35 days in the last six months (or ≤ 6 menstrual cycles during the last year). Weight was measured with Seca scale with a precision of 100 g and height measured with Harpenden stadiometer to 0.1 cm. BMI and BMI z-score were calculated. Hirsutism was evaluated independently by the two authors (A. Z-B and A.G.) and diagnosed if the modified Ferriman-Gallwey score was ≥ 8 . In each girl, a transabdominal pelvic ultrasound examination was performed by the same observer (A. D-C.) with 5 MHz convex transducer (Siemens Acuson Antares 5.0), and volume and structure of the ovaries were evaluated. Ovaries were considered polycystic (polycystic ovary morphology, PCOM) if 12 or more cysts of 2–9 mm in diameter were present in at least one ovary and if increased ovarian volume (> 10 mL) occurred. Basal plasma concentration of gonadotropins (LH, FSH), androstenedione (A), testosterone (T), 17-hydroxyprogesterone (17OHP), oestradiol (E_2), sex hormone binding globulin (SHBG) and dehydroepiandrosterone sulfate (DHEAs) were measured. Free androgen index ($FAI = T/SHBG \times 100$) and LH/FSH ratio were calculated. All the tests were performed during the follicular phase of menstrual cycle (3rd–7th day of cycle) or after three months from the last menstruation. PCOS was diagnosed according to the Androgen Excess and PCOS Society criteria [17]. Serum levels of LH, FSH, T, DHEAs, and E_2 were measured using chemiluminescent immunoassay by Immulite 2000 analyser (DPC, USA), and SHBG was determined by immunoradiometric assay (Radim, Roma, Italy). 17OHP and A were measured by enzyme-linked immunosorbent assay (DRG Diagnostics GmbH, Germany).

In all participants, social competence inventory (SCI) [18] and psychological gender inventory (PGI) [19] were performed. The questionnaires were anonymous and independently answered with no time limit, but the average time of completion was 15 minutes. The SCI is a self-report questionnaire that was developed by Matczak from the Psychological Test Laboratory of the Polish Psychological Association in Warsaw [18] to assess social abilities of adolescents. It is designed to measure competences in three aspects: Intimacy (I) — the ability to develop close interpersonal relationships, to share private information and feelings with another

Table I. Clinical and hormonal characteristics of adolescent girls with polycystic ovary syndrome (PCOS) and a control group of healthy girls**Tabela I. Kliniczna i hormonalna charakterystyka nastoletnich dziewcząt z zespołem policystycznych jajników (PCO) oraz w grupie kontrolnej zdrowych dziewcząt**

	Girls with PCOS (n = 28)	Control group (n = 12)	p
Chronological age (years)	17.1 (16.3–7.3)	16.9 (16.0–17.8)	NS
Gynaecological age (months)	51.0 (35.0–64.0)	55.0 (40.5–65.5)	NS
Cycle duration (days)	36.5 (31.0–78.0)	32.0 (26.4–36.3)	0.03
BMI z-score	1.2 ± 1.2	0.7 ± 1.4	NS
Ferriman-Gallwey score	10.0 (7.5–12.0)	1.0 (0.0–3.0)	< 0.001
Mean volume of the ovaries [mL]	5.7 (4.4–8.0)	5.6 (4.1–7.2)	NS
LH/FSH	0.9 (0.7–1.8)	1.2 (0.8–1.5)	NS
testosterone [ng/dL]	66.1 (49.6–85.9)	42.2 (29.9–58.2)	0.04
androstenedione [ng/mL]	3.2 (2.6–4.5)	2.1 (1.6–3.6)	NS
DHEAS [μg/mL]	262.0 (210.0–315.6)	233.0 (197.0–252.0)	NS
17OHprogesterone [ng/mL]	1.5 (1.1–2.2)	1.6 (0.9–2.1)	NS
oestradiol [pmol/L]	131.0 (95.1–181.0)	82.2 (73.4–175.0)	NS
SHBG [nmol/L]	24.9 (15.1–43.5)	26.7 (18.8–41.7)	NS
FAI	9.8 (8.0–17.3)	5.2 (1.8–6.8)	0.05

Note: Values are median (interquartile range). SHBG — sex hormone binding globulin; FAI — free androgen index

person; Self Presentation (SP) — connected to one's behaviour in formal situations and being an object of assessment of many people; and Assertiveness (AS) — dealing with competence for reaching one's own aims by influencing others. The SCI consists of 90 sentences related to a participant's reaction to various situations — 60 diagnostic, connected to social competences, and 30 sentences irrelevant to social abilities. The sentences are rated in a four-grade scale, where 1 is "I would not be able to cope with the situation", and 4 is "I would have no problems coping with the situation". A higher score on the whole test and on each subscale indicates higher social competences. The result can be presented as the absolute number and sten score [20].

The PGI is also a self-report questionnaire that was developed by Kuczynska from the Psychological Test Laboratory of the Polish Psychological Association in Warsaw [17] on the basis of Sandra Bem's Gender Schema Theory [21], to assess sex-typical behaviours. It consists of 35 attributes — 15 feminine characteristics, 15 masculine characteristics, and five features that are neutral. The attributes are rated by a participant in a five-grade scale of identification to each attribute, where 1 is "I am not this kind of person", and 5 is "I am this kind of person". The results are expressed as rates, in both — feminine and masculine schemes. There are four types of psychological gender identities: 1. sex-typed — individuals who

process and integrate information that is in line with their gender i.e. feminine woman/masculine man; 2. androgynous — having both male and female characteristics; 3. sexually undifferentiated — with low scores in both scales, and 4. cross-sex-typed — individuals who process and integrate information that is in line with the opposite gender.

Auxological data, hormonal and psychological test results were compared using Statistica 8.0 PL. All values were expressed as mean standard deviations for normal or median (interquartile range) for skewed distribution. Correlation analysis was performed using the Pearson correlation coefficient for normally distributed samples, and Spearman correlation coefficient for non-normally distributed data. Gamma correlation was used for non-normal distributions with many tied ranks. Comparison between groups was performed using *t*-Student test for normally distributed data and Mann-Whitney U test for skewed distributions. P value < 0.05 was considered statistically significant.

Results

The clinical and hormonal characteristics are presented in Table I. All participants were Caucasian school students aged 14.2–18.0 years (14.8–18.0 years in the study group, 14.2–18.0 years in the control group). All girls

Table II. Social competence inventory (SCI) and psychological gender inventory (PGI) results in adolescent girls with polycystic ovary syndrome (PCOS) and in a control group of healthy girls**Tabela II.** Wyniki kwestionariusza kompetencji społecznych (SCI) i inwentarza do oceny płci psychologicznej (PGI) u nastoletnich dziewcząt z zespołem policystycznych jajników (PCOS) oraz w grupie kontrolnej zdrowych dziewcząt

	Girls with PCOS (n = 28)	Control group (n = 12)	p
Social competence inventory (scores)	179.5 ± 20.0	179.9 ± 19.7	NS
Social competence inventory (sten scores)	5.7 ± 1.7	5.6 ± 1.8	NS
Intimacy (scores)	46.4 ± 6.2	45.0 ± 5.5	NS
Intimacy (sten scores)	5.9 ± 1.9	5.5 ± 1.7	NS
Self Presentation (scores)	55.5 (47.5–58.5)	51.5 (48.5–64.5)	NS
Self Presentation (sten scores)	6.0 (4.0–7.0)	5.0 (4.0–7.5)	NS
Assertiveness (scores)	47.6 ± 7.0	48.3 ± 8.6	NS
Assertiveness (sten scores)	5.4 ± 1.9	5.8 ± 2.1	NS
Psychological gender inventory			
Feminine gender scheme (scores)	58.5 (52.5–63.5)	59.5 (54.5–63.0)	NS
Masculine gender scheme (score)	47.0 (44.0–50.0)	47.0 (45.5–51.5)	NS

Note: Values are mean ± standard deviation for normal or median (interquartile range) for skewed distribution.

from the study group had at least one clinical symptom of PCOS (oligomenorrhea or hirsutism), and/or excessive body weight (BMI above 90th centile). Menstrual disturbances were present in 15 (53.6%) girls, hirsutism in 16 (57.1%) and overweight or obesity in 18 (64.3%) girls. As expected, hirsutism score, cycle duration, testosterone level and FAI were significantly higher in the girls with PCOS than in the control group.

The results of SCI and PGI are presented in Table II. There were no significant differences in all parts of SCI in absolute numbers and in sten scores between the study and the control group. Also in PGI, in both — the feminine gender scheme (FGS) and masculine gender scheme (MGS), the differences between the groups were statistically insignificant. The occurrence of the particular gender type was similar in both groups [androgynous type: ten (35.7%) *vs.* six (50.0%), $p > 0.05$; feminine woman: 12 (42.9%) *vs.* four (33.3%), $p > 0.05$, masculine woman: two (7.1%) *vs.* 0 (0%), $p > 0.05$, undifferentiated: four (14.3%) *vs.* two (16.7%), $p > 0.05$].

In the study group, concentration of DHEAS correlated positively with SP score ($r = 0.4$, $p = 0.03$). Additionally, there was a significant negative association between testosterone level and SCI score ($r = -0.5$, $p = 0.01$) as well as AS score ($r = -0.5$, $p = 0.02$). FGS score correlated positively with A concentration ($r = 0.4$, $p = 0.04$). There was no significant correlation between SCI or PGI and BMI z-score as well as hirsutism score.

To evaluate the influence of body mass on psychological profile, we divided the study group into

normal weight girls [BMI < 90 pc, $n = 10$ (35.7%)] and overweight and obese subjects [BMI > 90 pc, $n = 18$ (64.3%)]. We found no significant difference in all parts of SCI in absolute numbers and in sten scores as well as in PGI, in both FGS and MGS between these subgroups.

Discussion

This study demonstrated that in adolescent girls with PCOS social abilities and gender role are not different to those in their healthy peers. There was also no correlation between the clinical severity of symptoms and SCI or PGI scores. Although the quality of life as well as anxiety and depression symptoms in adolescents with PCOS have been analysed by several authors [5, 6, 10], to the best of our knowledge our study is the first report evaluating gender role and social competences in this group of girls.

Exposure to high levels of androgens during the prenatal period results in masculinisation of activity and occupational interest, sexual orientation, and some spatial abilities, but has a smaller effect on gender roles [22]. Although it has been suggested that pubertal androgens can influence sex-typical behaviours as well as some sex-linked forms of psychopathology, there is no convincing data regarding long-lasting behavioural effects of pubertal hormones [22].

In the study by Kowalczyk et al. [23], a subgroup of women with PCOS aged 23–30 years did not demonstrate problems with psychological gender roles. However, women older than 30 years often viewed themselves as sexually undifferentiated compared to the controls. This was prob-

ably caused by the considerably higher rate on the Ferriman-Gallwey score in the older women, as the intensity of hirsutism usually increases with time. The duration and severity of PCOS can negatively affect the self-image of a patient and lead to a disturbed identification with the female-gender scheme. Women are less likely to identify with a FGS, and more likely to see themselves as androgynous [23].

In our study, there were no significant differences in FGS and MGS, as well as the occurrence of the particular gender type between the study and control groups. This may be due to the shorter exposure to androgens in adolescent patients and also to the milder form of clinical hyperandrogenism, especially hirsutism. The differences could also be attributed to the younger age because some gender roles are acquired over time ("I as a wife", "I as a mother"). In the pilot study by Manlove et al. [24], women who suffered from PCOS in adulthood also did not demonstrate different scores on Bem's androgyny scale during adolescence compared to the control group and had similar sex-typical behaviours. However, they did have lower self-esteem, perceiving themselves to be "different" and had less social interaction with their peers.

Social skills can be defined as the different competencies related to a person's ability to cope with different types of social situations. During adolescence, peer relations become particularly important for children. A key developmental task of adolescence is the formation of self identity and social roles. These skills are associated with effective interpersonal relations in adult life, including relations with co-workers and with romantic partners [25]. The wide range of physical and psychological problems occurring in adolescence can influence social roles during adult life. In PCOS adolescent patients, hirsutism, obesity and menstrual disorders potentially could be the factors that influence the formation of social abilities.

Jones et al. [5] found that excessive body weight and hirsutism in adolescent girls with PCOS could be responsible for lower quality of life, low self-esteem, self-consciousness, and poor self-image. In the study by Trent et al. [6], girls with PCOS experienced lower quality of life and those who had higher self-perceived severity of illness scored lower on a general health perception scale. BMI was a primary mediator in the quality of life reduction [24]. In contradiction, our study did not demonstrate any relationship between hirsutism score or BMI z-score with SCI parts, however BMI in our patients was much lower than in the adolescents evaluated by Trent et al. [26] (26.9 ± 6.3 vs. 31.7 ± 8.4 kg/m²).

In males, testosterone is known as the hormone which increases assertiveness and consequently aggressiveness [27]. Grant and France [28] found that in women, higher dominance scores in the Simple Adjec-

tive Test (a questionnaire designed to measure dominance) were associated with higher serum testosterone levels. To our surprise, we noticed a negative correlation between SCI, AS and testosterone level. We can speculate that in young girls the exposure to androgens is too short to show such influence as demonstrated in older women.

Our study limitation was the small number of participants in the control and study groups. The other weak point was the relatively short gynaecological age of our patients. On the other hand, the aim of the study was to evaluate adolescent girls to find out at what age clinical and/or biochemical hyperandrogenaemia may exert an influence on psychological development, and we showed that in our patients social competences in all three examined fields were not different to that in their healthy peers.

Our conclusion is that despite the presence of clinical and biochemical features that can influence sociopsychological condition, social abilities and gender roles in adolescent girls with PCOS do not seem to be disturbed. Because this study is a pilot, these findings need to be confirmed on a larger group of patients.

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