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The Difference in the Severity of Premenstrual Symptoms between Users and Non-users of Oral Contraceptives

Ivana Marčinko and Mirjana Torjanac

»J. J. Strossmayer« University, Faculty of Humanities and Social Sciences, Department of Psychology, Osijek, Croatia

ABSTRACT

Oral contraceptives (OC) are very a widely prescribed therapy for premenstrual symptoms yet, only a limited number of studies have explored the relationship between OC and numerous premenstrual symptoms. The aim of this study was to investigate the differences in retrospectively reported premenstrual symptoms between users and non-users of oral contraceptives. In total 385 women (186 OC-users and 199 non OC-users) participated in this study. Premenstrual symptoms were assessed with Woman's Daily Health Diary. Online data collection was used. A series of analysis (multivariate analysis of variance, t-tests and descriptive statistics) were performed in order to investigate the differences in severity of symptoms between two groups of women. Results have shown that there is a significant difference between OC-users and non OC-users in the overall level of premenstrual symptoms ($t(383)=4.29$, $p<0.001$, $d=0.44$) with OC-users reporting fewer symptoms. The differences between two groups of women were also found with respect to physical ($t(383)=5.13$, $p<0.001$, $d=0.48$), and psycho-emotional symptoms ($t(383)=3.21$, $p<0.001$, $d=0.34$), concentration ($t(383)=2.74$, $p=0.006$, $d=0.28$) as well as appetite-related ($t(383)=3.57$, $p<0.001$, $d=0.57$) and sleep-related problems ($t(383)=3.08$, $p=0.002$, $d=0.33$), with OC-users reporting less severe disturbances in all those categories. No difference was found in regards to well-being ($t(383)=0.60$, $p=0.546$) or sexual functioning ($t(383)=0.34$, $p=0.734$) between two groups of women. Findings of this study suggest that OC-users in comparison to non-users suffer from fewer premenstrual symptoms.

Key words: *menstrual cycle, premenstrual syndrome, contraception, fertile period, women's health*

Introduction

Premenstrual syndrome (PMS) is the name for a group of symptoms that occur during the luteal phase of menstrual cycle (7-10 days prior to a period), and which are associated with impairment of daily activity[1]. Varieties of affective, somatic and behavioural symptoms are part of PMS. Affective symptoms which are attributed to PMS are depression, anxiety and irritability. Somatic symptoms include headaches, abdominal pain, abdominal bloating and weight gain and/or fatigue. The behavioural group is comprised of symptoms such as overeating or food cravings, changes in libido or sleep and withdrawal from usual activities[2,3]. All those symptoms last on average six days, and usually peak two days prior to the first day of the period[4]. It is assumed that approximately 80% of women of reproductive age experience certain changes during the premenstrual phase of the cycle. Most of these symptoms are mild and reflect normal biological changes. However, for 20% to 40% of women these symptoms impede everyday activities[5,6] while 10% of them have to look for medical help[7]. The presence of PMS in a woman's life is felt in a marital relationship, at home and in the workplace[8,9].

Since the aetiology of PMS remains unclear, there are many treatments which are directed towards finding relief for women who are suffering from PMS. There are many non-pharmacological as well as pharmacological treatments. Severe PMS is treated with drugs[10] while moderate symptoms are often addressed by lifestyle changes, dietary modifications or supplementations[1,10]. The goal of all of these treatments is to reduce symptoms and to improve social and professional functioning and overall quality of life of sufferers.

Oral contraceptives (OC) represent one of the pharmacological treatments. These drugs aim to reduce ovulatory hormonal cyclicity which is believed to lie at the core of

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PMS. By taking OC, women are exposed to daily doses of exogenous sex hormones, synthetic forms of oestrogen and progesterone. Ethinyl estradiol is the most common oestrogen used while there are multiple forms synthetic progestogens (progestins) used in OC.

Inconsistencies in results from research regarding the effect of OC on PMS symptoms were found. Some studies identified a relief in PMS symptoms among OC-users, others none[11,12] while some others reported an exacerbation of symptoms after OC exposure[13,14].

The data regarding the effects of OC on physical symptoms is far from conclusive. Older generations of birth control pills often fell short with respect to reduction of painful periods, clear skin or other somatic complaints[12] while the newer generation of pills seems more promising[15]. OC-users generally report fewer or less severe physical symptoms in comparison to women who were given placebo. Feelings of bloatiness or swelling of the abdomen, breast tenderness or pain along with facial acne and seborrhea are felt less frequently[15, 16]

Some studies where a relationship between OC and mood were investigated reported mood improvement[17,18] and other did not[14,16.] Research that reported mood improvement among OC-users indicated that OC-users in comparison to women who haven't been on birth control pill experienced less mood variability during the entire cycle as well as during the menstruation. They were also less susceptible to negative emotions during the menstruation phase[19].

Despite the extensive use of OC for purposes of relieving premenstrual symptoms, little is known about how OC affects appetite and body weight. A common belief among OC-users is that being on a hormonal therapy increases appetite and body weight. Some small studies even confirm this[20]. Bancroft and Rennie[21] however found no difference in timing and severity of premenstrual food craving between OC-users and non OC-users. Similar results were also reported by more recent studies in which OC did not seem to alter calorific intake[22,23].

Sleep changes among OC-users are also well documented in various studies. Woman taking OC were shown to have reduced sleep onset latency, an increased percentage of REM sleep andstage-2 sleep along with a lower apnea–hypopnea index[24-26]. On the other hand, no difference in subjective sleep quality has been documented comparing women who are taking OC and woman with natural menstrual cycle[26].

As far as cognitive functioning is concerned it has been demonstrated that exposure to synthetic sex hormones may induce some changes in cognitive functioning. Evidence showed the presence of enhanced cognitive abilities among OC users regarding tasks involving verbal memory[27] and mental rotation[28,29]. Less cognitive variations throughout the menstrual cycle were also found among OC-users[30,31]. In comparison, no difference was found on tasks involving verbal fluency[27] and memory[32]. It is clear that more studies are needed to reveal the true nature of OC-dependent effects on cognition.

Changes in well-being and sexual functioning were shown to be the most adverse reactions of OC and the most common reason for its discontinuation. Women on birth control pills had experienced depression, fatigue and mood swings more frequently than controls who were receiving placebo[33,34]. Positive effects of OC were also documented[15]. In some women, OC had a stimulatory effect, similar to that of many antidepressants[35]. Many women using OC reported a reduction in negative mood and increase of positive mood several months after taking the pill[36].

The negative effects of OC on sexual functioning are associated with inhibited productions of androgens, especially testosterone, which directly reduces sexual pleasure during the intercourse. This also decreased the frequency of sexual thoughts, and psychosexual arousability among OC-users[37].

Given the high prevalence of OC use and the potential for unfavourable but also beneficial effects of OCs a present study was conducted with the aim of investigating the difference in retrospectively reported PMS symptoms between OC-users and non-users. Although numerous studies looked at the association between OC and PMS symptoms, many of them focused on general level of symptoms or a few symptom categories at the most. In response to this, the present study investigated the differences between OC users and non-OC including the whole array of PMS disturbances: a) physical symptoms; b) psycho-emotional symptoms; c) sleep-related problems; d) appetite-related changes; e) well-being; f) concentration, and g) sexual behaviour. Furthermore, the study also aimed to identify the most prevalent PMS symptoms within each symptom category for both groups of women. This should allow us to know if OC-users in comparison to non OC-users suffer from the very same nature of PMS complaints or a totally different set of symptoms.

Materials and Methods

Participants and procedure

The research consisted of two stages, preliminary and the main research phase. The purpose of the preliminary stage was to translate and adapt the Woman's Daily Health Diary to a Croatian sample. Thus, translation of the Woman's Daily Health Diary to Croatian language had to take place first. To translate the instrument, a double-blind technique was used. The examination of the preliminary psychometric properties of the instrument then followed. The data collection during this stage as well as during later stage was online. The questionnaire was put on several forum sites, blog sites and Facebook pages which are used by both genders or by females only. A retrospective study design was used in both instances. The results reported here are drawn from the main research only.

In both stages women with a regular menstrual cycle (25-35 days) were assessed. In the preliminary research 244 women of age between 16 and 42 (Mage=24.73, SD= 4.44) participated. In the main research 510 women were

TABLE 1
DESCRIPTIVE STATISTICS FOR RESEARCH VARIABLES

	$\overline{X}$	SD	Minimum	Maximum	Theoretical minimum	Theoretical maximum
Physical symptoms	27.70	13.40	0	68	0	68
Psychoemotional symptoms	28.46	17.97	0	79	0	80
Well being	3.36	3.56	0	16	0	16
Appetite-related symptoms	8.69	4.15	0	24	0	24
Concentration	3.75	4.06	0	16	0	16
Sexual behavior	2.74	1.55	0	8	0	8
Sleep	3.72	3.54	0	15	0	16
Overall level of PMS symptom	78.43	38.74	2	204	0	228

assessed. Of the 510 who completed the questionnaire 22 women were using other hormonal therapy (mainly for thyroid gland regulation), 29 women had changed OC therapy in the last six months, 20 women had used it for less than six months, whilst 54 women did not use any hormonal therapy at that time but used it prior. Results of all those participants were excluded from the further analysis in order to minimize the influence of confounding factors. Only women who had never used OC and those who used it for at least last six months were included in the final sample. A total of 385 women fulfilled the criteria, of which 186 were OC users, and 199 were non OC-users. The age of OC users ranged from 18 to 45 ($\overline{X}$=31.39, SD=7.79). The age range of non OC-users ranged from18 to 45 ($\overline{X}$=31.41, SD=9.97).

Instruments

Information about their age and menstrual cycle were obtained by asking respondents to write down their age and length of the menstrual cycle. Consumption of OC were assessed by the following questions: 1) Do you use birth control pills? (Yes/No); 1a) If yes, how long have you used it?; 1b) If yes, have you switched to a new birth control pill within last 6 months? (Yes/No); 1c) If no, have you used a birth control pill ever before? (Yes/No). Participants were also asked if they had any chronic conditions (Do you have any chronic disease? – Yes/No) and whether they were using any other hormone therapy (Do you use any other forms of hormonal therapy e.g. for thyroid control? – Yes/No).

The Woman's Daily Health Diary (WDHD)[38] was used to assess menstrual cycle symptoms. This instrument consists of 57 items distributed into seven symptom scales: a) physical; b) psycho-emotional; c) sleep; d) appetite; e) well-being; f) concentration and g) sexual behaviour. In order to complete the scales respondents were asked to recollect how they tend to feel during the time preceding menstruation and then to answer how severely they experience each symptom on a five-point Likert scale (0-did not experience, 4-severely experience). The score for each component is obtained by summing corresponding item scores while the total score has been obtained by summing all the items scores. A higher result indicates a more severe prevalence of corresponding symptoms. Internal consistency of the WDHD and its scales determined in the preliminary phase was good. The Cronbach alpha coefficient for WDHD was.95 while for the scales ranged from 0.68 to 0.93. In the present study, coefficient of internal consistency for the WDHD is 0.96 while for the individual scales ranged 0.70 to 0.95

Statistical analysis

Normality of distributions was assessed by the Kolmogorov-Smirnov test along with skewness and kurtosis indices, and according to the results, parametric procedures were used in further analyses. The difference among variables between OC-users and non OC-users were tested by a series of independent t-tests, the multivariate analysis of variance (MANOVA) and descriptive statistics. The p values below 0.05 were considered significant. For the purposes of analysis Statistical software SPSS 19.0 was being used.

Results

Data analysis began with the calculation of descriptive statistics for the research variables. Descriptive statistics are shown in Table 1.

Descriptive statistics indicate that participants generally reported a lower overall level of PMS symptoms and a low severity of individual symptom clusters. Correlational coefficients between symptom categories of WDHD were also calculated. Table 2 shows correlational coefficients between individual subscales (Table 2).

As can be seen, all the subscales of WDHD correlate with each other. The correlations between subscales range from low to high (.22 to.73).

TABLE 2
CORRELATIONS BETWEEN SYMPTOM CLUSTERS

	1	2	3	4	5	6	7
1. Physical symptoms							
2. Psychoemotional symptoms	.62**						
3. Well-being	.28**	.22**					
4. Appetite-related symptoms	.51**	.57**	.33**				
5. Concentration	.64**	.73**	.29**	.44**			
6. Sexual behavior	.36**	.43**	.34**	.42**	.36**		
7. Sleep-related symptoms	.64**	.59**	.34**	.46**	.66**	.39**	

**p<0.01

TABLE 3
DESCRIPTIVE STATISTICS OF OVERALL LEVEL OF PREMENSTRUAL SYMPTOMS AND T-TEST RESULTS COMPARING OC-USERS AND NON OC-USERS

	N	$\overline{X}$	SD	df	t	p	Cohen's d index
OC users	186	69.84	39.01	383	4.296	<0.001	0.44
Non – OC users	199	86.45	36.82				

The difference in overall level of reported PMS symptoms between OC-users and non OC-users

To test whether women exposed to OC as oppose to those who are not experience different overall level of PMS symptoms, the independent sample t-test was performed. Results of this analysis are presented in Table 3.

As can be seen, the results show that there is a significant difference in severity of PMS symptoms between two groups. Mean values of the test variables indicate that non-users report more premenstrual symptoms than OC-users. Cohen's d index shows that the magnitude of the difference between two groups is moderate (i.e. 0.4).

The differences in reported PMS symptom clusters between OC-users and non OC-users

In order to investigate the differences in severity of PMS symptom clusters experienced by OC-users and non OC-users, a multivariate analysis of variance (MANOVA) was performed. Results of this analysis showed that there is a significant difference in the severity of PMS symptom clusters between OC-users and non OC-users ($F(7,377)= 4.710$, $p<0.001$; Wilks' lambda=.92; partial eta squared=.08). In order to identify clusters of premenstrual symptoms in

TABLE 4
DESCRIPTIVE STATISTICS OF PREMENSTRUAL SYMPTOM CLUSTERS AND T-TEST RESULTS COMPARING OC-USERS AND NON OC-USERS

	OC use	$\overline{X}$	SD	df	t	p	Cohen's d index
Physical symptoms	YES	24.19	13.22	383	5.132	<0.001	0.48
	NO	30.98	12.75				
Psychoemotional symptoms	YES	25.45	17.37	383	3.213	<0.001	0.34
	NO	31.27	18.11				
Well-being	YES	3.25	3.79	383	0.605	0.546	
	NO	3.47	3.35				
Appetite-related symptoms	YES	7.91	4.34	383	3.578	<0.001	0.57
	NO	9.41	3.85				
Concentration	YES	3.17	3.87	383	2.742	0.006	0.28
	NO	4.30	4.16				
Sexual behavior	YES	2.72	1.64	383	0.340	0.734	
	NO	2.77	1.46				
Sleep-related symptoms	YES	3.16	3.50	383	3.084	0.002	0.33
	NO	4.26	3.50				

which two groups of women differ, a series of independent t-test were undertaken. Tests were conducted using Bonferroni adjusted alpha levels of.007 per test (.05/7). Results of these analyses can be found in Table 4.

As is evident, OC-users as opposed to non OC-users reported different levels of severity amongst a whole array of premenstrual symptoms. Significant differences were found in physical, psycho-emotional, appetite and sleep-related symptoms as well as concentration. OC-users tended to report fewer symptoms in each category as opposed to women who did not undertake such therapy. Cohen's d indicated that magnitude of differences between women in all those categories was moderate. No difference was found between two groups with regards to well-being or sexual behaviour although there was a trend toward a higher level of reported symptoms among non OC-users.

The next goal was to identify the most pronounced symptoms within each symptom category for OC-users and non OC-users. As far as physical symptoms were concerned, women who were users as well as non-users scored high (»extremely severe« and »severe« responses) on following three items: bloating of abdomen (47.9% of total OC-users and 64.3% of total non OC-users), painful breasts (45.2% of total OC-users and 66.3% of total non OC-users), and sensation of weight gain (33.4% of total OC-users and 41.7% of total non OC-users).

Both groups of women also responded similarly regarding the measurement of psychoemotional symptoms. Indicators for which women scored high (»extremely severe« and »severe« responses) were: rapid mood changes (41.9% of total OC-users and 46.7% of total non OC-users), anger (39.7% of total OC-users and 51.2% of total non OC-users) and tearfulness, crying easily (40.3% of total OC-users and 44.2% of total non OC-users). Women who were not on OC therapy scored high on symptoms of depression (50.2%) too.

Similar changes in appetite were registered for women from both groups. Women scored high (»extremely severe« and »severe« responses) on items: craving for specific food or tastes (49.5% of total OC-users and 49.5% of total non OC-users) and increased appetite (46.3% of total OC-users and 46.3% of total non OC-users).

Women from both groups scored low on indicators of sleep and concentration disturbances. The majority of women tended to respond they had »none« of the mentioned symptoms. Women who did report such problems usually experienced those symptoms in a »mild« or »moderate« severe form.

Sleep symptoms were found to be common amongst women from both groups. These were: increased sleeping (37.6% of total OC-users and 37.2% of total non OC-users) and difficulty in getting to sleep (24.7% of total OC-users and 34.7% of total non OC-users). Non OC-users also suffered from early morning awakening (34.2%) and awakenings during the night (32.7%).

Concentration problems which all women complained about included: confusion (39.2% of total OC-users and 39.7% of total non OC-users) and difficulty concentrating (37.1% of total OC-users and 59.8% of total non OC-users). For non OC-users difficulty making decision (37.7%) and lowered coordination/clumsiness (36.2%) were also present.

Discussion

The differences between OC users and non OC-users in the overall level of PMS symptoms

Many women experience PMS symptoms which are significantly impairing everyday living. Only a limited number of studies have explored the connection between OC and the series of PMS disturbances, hence this research offered valuable information regarding these relationships. The data of this study has shown that the differences in severity of PMS symptoms do exist between OC-users and non-OC users, with women exposed to OC reporting fewer PMS symptoms.

The differences between OC-users and non OC-users can be explained in several ways. As ovulation is a prerequisite of premenstrual symptoms, the suppression of ovulation can be one reason for the association between OC exposure and fewer PMS complaints. Synthetic forms of female hormones which birth control pills contain to various extents maintain a stable level of hormones throughout the entire cycle. Consequently, the usual cyclicity of sex hormones occurring during the menstrual cycle which is responsible for PMS is inhibited.

The psychological effects of OC on experienced PMS symptoms cannot be excluded either. It is in our opinion that OC, other than via biological routes, affects symptom reporting. We believe that exposure to OC improves the quality of life of its users in various ways. Women who are on OC therapy may experience less anxiety or fear over the possibility of unwanted pregnancy. This may, as a consequence, have an impact on their psychoemotional and sexual functioning and life altogether. It may also be that OC-users no longer experience skin disorders, or they have lighter menstrual flow which contributes to their well-being during their premenstrual period similar to the rest of the month. After all, Graham and Sherwin[12] found that the PMS symptoms of the pill users started not more than two days before menstruation. Such a short duration of PMS symptoms most probably shape perception of OC-users in such a way that they feel their disturbances are present in very light form or not present at all. Furthermore, the fact that we didn't gather the information about timing when during the cycle women were surveyed raises a question whether the majority of OC users were accidently tested in the premenstrual or early menstrual phase while non-users in postmenstrual phase of the cycle. In this case we would suspect that OC-users answered questions in a more positive manner than non-users. Evidence supporting this hypothesis comes from studies where prospective vs retrospective evaluations of PMS symptoms have been compared. The evidence suggests more severe reports of PMS disturbances through retrospective assessment[39]. Thus, if the majority of OC users happened to be tested in the premenstrual phase of cycle

they may have answered questions by asking themselves how they felt right at that moment. On the contrary, if non-users were assessed at the different point in the cycle they had to recall their PMS experiences which made them more prone to negative judgements about their symptoms. The reason for it is that retrospective data reflects social stereotypes of the premenstrual woman[40]. Basically, cognitions that women apply while judging their premenstrual or menstrual experiences are influenced by the cultural norms emphasising the role of feminine women. As feminine conception of women includes negative perception of menstruation, all the symptoms related to premenstrual or menstrual phase of cycle are processed negatively.

The differences between OC-users and non OC-users in severity of PMS symptom clusters

Results of this study also indicated that OC-users in comparison to non OC-users differ not only in the total level of experienced PMS symptoms but the severity of certain syndromes too. Two groups of women reported different degrees of physical, psycho-emotional, appetite and sleep-related and concentration symptoms during the premenstrual phase of the cycle.

When physical symptoms are concerned, OC-users tended to report fewer symptoms than non OC-users. Most common symptoms among OC-users as well as non OC-users were painful breasts, bloating of the abdomen and a sensation of weight gain which is consistent with earlier research[16,41-43]. From the biological point of view, progesterone in OC can be accounted for the positive effects of OC. This hormone interferes with renin-angiotensin-aldosterone system (RAAS) known to be responsible for sodium retention and subsequently, fluid accumulation in the body. Although progesterone used in older preparations of OC was not strong enough to counteract the sodium retention effects, which increased fluid retention and a sensation of increased body gain among OC-users, the newer generation of OC have progestogens which have strong antimineralocorticoid and antiandrogenic activity meaning that they counteract cyclical weight gain and other symptoms related to fluid retention[44]. In turn, this contributes to less pronounced bloating or sensation of weight gain among OC-users.

This study has shown that women who are on a birth control pill reported less severe psychoemotional symptoms in comparison to women who were not using the pill. Most salient psychoemotional symptoms for all women tended to be rapid mood changes, anger and tearfulness although non OC-users reported depression to be relatively pronounced also. There are two approaches which explaining a lower degree of psychoemotional symptoms among OC-users. Prevalent opinion is that pharmacological properties of the pill or more specifically oestrogen directly affects mood. Oestrogen modulates levels of serotonin (5-HT) by increasing 5-HT postsynaptic response and the number of receptors, as well as its uptake. It also increases norepinephrine (NE) levels by decreasing monoamine oxidase (MAO) activity. It is a gamma-aminobutyric acid (GABA) agonist, and it may have dopaminergic effects. All of the above suggests that oestrogen has an antidepressant effect on the central nervous system[45] which can explain the results.

On the contrary, some suggest that OC and mood relationship could be better explained by the psychological response to the practise of contraception rather than a biological one[46]. Some studies have identified no relation between the blood level of oestrogen or progesterone and emotional functioning[47]. In this case, the positive effects of oral contraceptives on psychoemotional functioning are more due to the placebo rather than biological effects of the pill.

OC-users compared to non OC-users reported lower appetite related changes. The most common symptoms among both groups of women were increased appetite and craving for specific foods or tastes. It is hypothesised that appetite-related differences could be explained by the action of oestrogen due to the fact that it has similar effects on appetite like leptin, a hormone which is responsible for food intake and energy balance. Leptin sends signals to the brain regarding how much fat body currently has in store and how much the person is eating. In that way leptin tells the brain how to regulate energy homeostasis. Similar to leptin, oestrogen reduces food intake and adiposity[48]. Oestrogen also facilitates the brain's sensitivity to leptin which promotes the action of leptin even further[49]. This means that oestrogen and leptin have interactive roles, and that they mutually work on regulating food intake and body fat control.

Even though problems with concentration were a less salient group of symptoms for both groups of women, OC-users as opposed to non OC-users still tended to experience less severe concentration symptoms. The most troubling symptoms for OC-users were confusion and difficulty concentrating. Aside from these, non OC-users also experienced difficulties in decision making and lowered coordination/clumsiness. Past studies suggest that high levels of synthetic oestrogen underline improved concentration among OC-users. Normal or high levels of oestrogen promote dendritic spine density on CA1 neurons of the hippocampus[50]. It also contributes to the increase of the number of synapses on the multiple synaptic boutons not previously connected in that area of the brain[51]. Oestrogen affects memory and concentration through neurochemical systems also. Mohn[31] reported that oestrogen facilitates acetylcholine (Ach) synthesis, a neurotransmitter proven to be essential for conscious awareness as well as for learning and memory processes.

Sleep problems were also a less pronounced set of symptoms amongst women from both groups however, on the whole, OC-users tended to report less sleep disturbances than non OC-users. Women exposed to hormonal therapy mostly complained about increased sleepiness and a difficulty in getting to sleep while women who weren't on the pill experienced awakenings during the night and early morning awakening in addition to these symptoms

too. Literature suggests that both, progesterone and oestrogen could be responsible for the positive influence of OC on sleep. Progesterone with its hypnotic like effects through the action of its metabolites on GABA receptors[52] and oestrogen through its influences on metabolism of several neurotransmitters[53]. There is evidence that OC may regulate sleep via thermoregulation as well. Just before falling asleep the body core temperature falls which serves as a signal for the brain to start with the secretion of melatonin, a hormone which regulates sleep cycles. It is suggested that this process is linked to sex hormones. Evidence for this hypothesis comes from research which showed that sex hormone receptors exist in the hypothalamus, a centre for temperature regulation of the human body, and neurons in this brain region besides being reactive to changes in body temperature react to changes in sex hormones levels too[54]. Oestrogen seem to be quite important for this process since it regulates the time of lowest body temperature during the night which means it has a thermoregulatory role.

No differences were found in well-being or sexual behaviour between the two groups of women. It may be that differences in well-being were not detected since the premenstrual phase of the cycle is generally perceived as a negative period by most women. Another reason may be how well-being was measured in this study. Being »in control« or having »increased activity« as some of the WDHD items look like do not seem to evaluate a person's well-being well. Well-being, as a construct, is grounded on the subjective perception of the quality of life, and it incorporates information from varied domains of life. As such, it seems more appropriate to measure well-being with questions which are general in nature as some other more recognised well-being measures do (e.g. Satisfaction with life scale).

No difference with respect to sexual functioning has been found between the two groups of women. It is believed that measuring sexual functioning with one item only (increase/decrease of sexual desire), as the WDHD does, is not sufficient. It would seem necessary to use more items to assess different aspects of sexual functioning, such as frequency of sexual thoughts or degree of sexual arousal, to examine changes in one's sexuality more accurately.

When interpreting the results, methodological limitations of this study should be mentioned. First, although healthy women with regular menstrual cycle took part in this study we don't know what women's baseline symptoms were prior to OC treatment. Second, retrospective reports are usually affected by personal beliefs or various biases. Judgements about symptom severity may be subjected to attitudes on sexuality, opinions on efficacy of oral contraceptives, personality traits (particularly neuroticism and perfectionism), sociodemographic factors and social support. Third, no assessments about what kind of birth control pills women were using (monophasic, biphasic or triphasic) has been made. By not having this information we don't know if the differences between two groups of women should be attributed to one particular type of OC or OC in general. One may suspect less pronounced differences between users and non-users if users used biphasic or triphasic preparations because these pills mimic the usual cyclic fluctuations of sex hormones thus, contributing to more severe PMS symptoms amongst OC-users. As oppose to that, monophasic pills keep level of the sex hormones constant all throughout the month contributing to fewer PMS symptoms amongst its users which in turn, may have increased the differences between two groups of women. However, controlled-placebo studies on the effects of OC on PMS symptoms show that exposure to any OC preparations is superior to no treatment at all[16,55] which brings us to conclusion that regardless of not having information about OC preparations the results were still valid to provide us with an answer to the main research question of this study.

Conclusion

It is clear that women exposed to OC tend to experience far less and less severe PMS symptoms than women with a normal menstrual cycle. OC-users experience less physical, psycho-emotional, appetite and sleep-related symptoms as well as concentration symptoms during the premenstrual phase of life, hence certainly improving their quality of life immensely. The differences between women detected in this study should be, to a larger degree, attributed to the hormonal or biological systems however, there are many psychological and social influences which cannot be ignored either. After all, if we just take into account that there are discrepancies in data between various studies then we need to acknowledge that there is more to PMS than just the causal relationship between the exposure to the synthetic sex hormones and symptoms and behaviour.

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I. Marčinko

»J. J. Strossmayer« University, Faculty of Humanities and Social Sciences, Department of Psychology, L. Jager 9, 31 000 Osijek, Croatia
e-mail: marcinko.iv@gmail.com

RAZLIKE U ZASTUPLJENOSTI PREMENSTRUALNIH SIMPTOMA IZMEĐU KORISNIKA I NEKORISNIKA ORALNE KONTRAPCIJE

S A Ž E T A K

Oralna hormonalna kontracepcija (OHK) često se koristi u tretmanu simptoma predmenstrualnog sindroma (PMS) međutim, ograničen broj istraživanja ispitivao je odnos OHK-a i niza različitih PMS simptoma. Cilj ovog istraživanja bio je ispitati razlike u retrospektivnim izvještajima o zastupljenost PMS simptoma između korisnica i nekorisnica OHK-a. U istraživanju je sudjelovalo ukupno 385 žena (186 žena koje koriste OHK i 199 koje ne koriste). Za mjerenje simptoma korišten je Dnevnik svakodnevnog zdravlja žena. Prikupljanje podataka bilo je online. Nizom analiza (složenom analizom varijance, t-testovima, deskriptivnom statistikom) ispitane su razlike u zastupljenosti PMS simptoma. Pokazalo se kako između dvije skupine žena postoji razlika u ukupnoj zastupljenosti PMS simptoma ($t(383)=4,29$, $p<0,001$, $d=0,44$) s tim da korisnice OHK-a izvješćuju o prosječno manjoj ukupnoj zastupljenosti simptoma. Osim toga, razlike su utvrđene kod tjelesnih ($t(383)=5,13$, $p<0,001$, $d=0,48$), psiho-emocionalnih simptoma ($t(383)=3,21$, $p<0,001$, $d=0,34$), prehrambenim navikama ($t(383)=3,57$, $p<0,001$, $d=0.57$), koncentraciji ($t(383)=2,74$, $p=0,006$, $d=0,28$) i navikama spavanja ($t(383)=3,08$, $p=0,002$, $d=0,33$) pri čemu žene izložene OHK-u izjavljuju o manjoj zastupljenosti svih spomenutih simptoma. Između dvije skupine žena nije utvrđena razlika u dobrobiti ($t(383)=0,60$, $p=0,546$) te seksualnom funkcioniranju ($t(383)=0,34$, $p=0,734$). Istraživanje upućuje kako žene koje koriste OHK u odnosu na one koje ju ne koriste pate od blažih PMS simptoma.