

The influence of SARS-CoV-2 infection on the quality of life of women who reach menopause

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Abstract

Introduction: At the time of the COVID-19 pandemic, providing adequate medical care in all its aspects, including the care of women with menopause and keeping social distance, was a challenge. Menopause results in a lower level of oestrogens and progesterone, which is the cause of lower immunological response and may result in more people being ill with COVID-19. The aim of the research was to evaluate the correlation between being sick with COVID-19 and the quality of life of women with menopause.

Material and methods: The research was done in a group of 249 women with menopause. The criteria deciding about inclusion into the group were as follows: female gender, age 40–65 years, time after infection with SARS-CoV-2 virus 14–30 days, no hospitalization, and diagnosis of SARS-CoV-2 virus infection by means of anti-gene test. A propriety survey was used as well as medical documents analysis and a questionnaire with standardized WHOQOL-BREF. SPSS Statistics 27.0 program was used for statistical analysis. In all calculations $p < 0.05$ was accepted as the level of significance.

Results: While evaluating the quality of life in the case of women after suffering from COVID-19 caused by the SARS-CoV-2 virus, no statistically significant difference was observed. The correlation between the level of satisfaction with one's health and suffering from SARS-CoV-2 was within the range of $\alpha = 0.1$, with a significance level $p = 0.061$.

Conclusions: No statistically significant correlation was noted between the quality of life of women with menopause after SARS-CoV-2 and women who did not suffer from it.

Key words: quality of life, menopause, coronavirus SARS-CoV-2, COVID-19 pandemic.

Introduction

In November 2019 in Wuhan China the first case of contagious respiratory system disease was discovered. It was caused by SARS-CoV-2 corona virus. The first case of coronavirus infection in Poland was diagnosed on 4 March 2020. On 16 March 2020, five days after the World Health Organization (WHO) announced a global pandemic, Poland introduced the first degree of epidemiological threat (lockdown) [1, 2]. At the time of the COVID-19 pandemic, providing the appropriate health care in all its aspects was a great challenge, including provision of menopause care with social distancing [3, 4]. The pandemic caused a huge burden that women had to deal with, because it was women who were most affected by the restrictions caused by the COVID-19 pandemic. They were exposed to complex situations like working from home while providing support for the whole family. Working from home is a stressful environment, which may cause more serious menopause symptoms worsening their life quality [1, 3]. During menopause, hormonal changes take place,

the level of oestrogens and progesterone lowers, which causes lower immunological response and may lead to being more prone to COVID-19 [3]. Sex hormones, including oestrogens, interact with immunological system in different ways, they affect the number of immune cells which are produced and how they react to infection [4]. According to the WHO definition from 1996 approved by the International Menopause Society (IMS), menopause is the final end of menstruation as a result of cessation of activity from ovaries, after which no bleeding ensues for 12 months, and it is not caused by pathological or physiological reasons [5–7]. Menopause is an exceptional event in women's lives, which, as the WHO reports, happens at the age 44–56 years, and in Poland women experience it at the age of 49 years on average [7, 8]. Menopause is a stage in life when women experience physical, psychological, and social changes, which affect the quality of their lives [9, 10]. Quality of life is perceived as the main health component, especially for women with menopause, and it has become an important sub-

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ject investigated and described in the literature [7, 9–11]. Lots of women with menopause show symptoms that affect the quality of life in a negative way, as well as women's health [9, 12]. Menopause is connected to ailments which are connected with physiology, and the physical and emotional changes have a considerable influence on women's lives [10]. At this time, after less activity on the part of ovaries and changes of the level of oestrogen and progesterone, typical menopause symptoms may occur, such as headache, breast ache, weight gain, flatulence, sleep disorders, mood swings, fear, flushing, or night sweats [7, 8, 13]. Some women may experience more serious symptoms, which may significantly affect their personal and social relations and their life quality. Life quality improvement is one of the most important medical interventions because it involves clinical aspects of a given illness as well as psychological aspect in patients' medical care. Life quality, as a scientific concept, is the feeling of well-being which results from satisfaction or dissatisfaction with life [8, 14]. Life quality is also a non-disciplinary concept that has a number of meanings, and it is studied by medical and psychological researchers because life quality depends on one's health [15]. Life quality includes many important aspects of human life, which can be analysed on many levels. Due to a variety of definitions, it is measured on different levels and with various tools, which make it possible to effectively use long-term preventive and caring actions as well as a better programming of social support [16].

The aim of the research was to evaluate the connection between being infected with SARS-CoV-2 and sick with COVID-19, and the quality of life of women with menopause.

Material and methods

A group of 249 women were studied. All participation in the research was completely voluntary. It was conducted from June 2020 to June 2021. Criteria of inclusion into the researched group were as follows: age 40–65 years; time after being infected with SARS-CoV-2 virus – at least 14 days but not longer than 30 days; lack of hospitalization; and diagnosis of being infected with SARS-CoV-2 virus by means of an anti-gene test. The group of women who were researched were at menopause age, out of whom 63 (25.30%) went through the infection with SARS-CoV-2 virus (researched group), and 180 women who did not go through infection with SARS-CoV-2 virus (controlling group). Respondents who failed to fill in the questionnaire completely ($n = 6$) were excluded from the survey. The exclusion point for age groups was accepted as 50 years because the average age of natural menopause is 45–55 years [17].

The method was a diagnostic survey and questionnaire. The tools comprised a proprietary questionnaire – a questionnaire with a standardized scale for

measuring the quality of life WHOQOL-BREF, including 26 questions. The raw results of the short version of the WHOQOL-BREF questionnaire were transformed into a scale of 0–100 [16]. The scoring of areas has a positive direction – the more points, the better the life quality. The WHOQOL-BREF questionnaire created by WHO experts is an international research tool for measuring life quality of sick and healthy people, adapted to Polish conditions by Wołowicka and Jaracz [16, 18]. Also, analysis of medical documents was carried out.

For statistical analysis SPSS Statistics 27.0 software was used. In all calculations, the significance level was accepted as $p < 0.05$. The above-mentioned numbers were accepted as statistically insignificant. The sample size was determined by the statistical method (using statistical distributions of the studied characteristics).

Results

The researched group included 249 women at the age 40–65 years (49.36 ± 6.28). The average age of women after SARS-CoV-2 infection was 45.66 ± 3.01 years, and the average age of women who did not suffer the infection was 56.64 ± 4.36 years. The vast majority of surveyed women came from cities (81.48%). The majority of surveyed women were married (68.31%). The biggest group was women with a university education (74.07%), and the smallest group was with vocational education (5.76%). More than half of the surveyed group (55.97%) had the correct body mass index (BMI). The last period > 12 months ago was declared by 36.63% of the surveyed women. Hormone replacement therapy was used in the past by 15.23%. Over half (55.40%) of the surveyed group did not have any abdominal surgeries. Socio-demographic parameters of the surveyed group are shown in Table 1.

Satisfaction with the quality of one's life and satisfaction with one's health were valued higher in the group of women who were not sick with COVID-19. No statistically significant difference was observed in the survey depending on being sick with COVID-19. It was observed that satisfaction with one's health was greater among women who did not go through SARS-CoV-2 virus infection (3.80 points) than among women who went through SARS-CoV-2 virus infection (3.57 points). The significance level was $\alpha = 0.1$, and it was observed that there was a slight correlation between the level of satisfaction with one's health and being infected with the SARS-CoV-2 virus. Spearman's correlation confirms that there was a slight linear correlation between the variables: $\alpha = 0.1$, level of significance $p = 0.061$. Life quality analysis according to the WHOQOL-BREF scale was also done in all 4 areas of life: somatic (physical), psychological, social, and environmental. The quality of life in all 4 areas did not differ (statistical significance) (Table 2).

Table 1. The profile of the surveyed women

Parameters	Category	Women after SARS-CoV-2 virus infection		Women who did not go through SARS-CoV-2 virus infection		Total	
		n	%	n	%	n	%
Age (years)	40–50	45	71.43	115	63.89	160	65.84
	51–65	18	28.57	65	36.11	83	34.16
Place of living	City	55	87.30	143	79.44	198	81.48
	Village	8	12.70	37	20.56	45	18.52
Marital status	Single	4	6.35	19	10.56	23	9.47
	Married	46	73.02	120	66.67	166	68.31
	Divorced	10	15.87	28	15.56	38	15.64
	Cohabitation	1	1.59	8	4.44	9	3.70
	Widows	2	3.17	5	2.78	7	2.88
Professional life	White collar job	40	63.49	105	58.33	145	59.67
	Blue collar job	7	11.11	15	8.33	22	9.05
	Mixed job	9	14.29	37	20.56	46	18.93
	Unemployed	7	11.11	23	12.78	30	12.35
Education	Vocational	4	6.35	10	5.56	14	5.76
	Secondary	12	19.05	37	20.56	49	20.16
	University	47	74.60	133	73.89	180	74.07
Abdomen surgeries	Yes, caesarean section	17	27.00	49	27.40	66	27.30
	Yes, other	13	20.60	46	25.70	59	24.40
	No	36	57.10	98	54.70	134	55.40
BMI	Less than correct weight	1	1.59	5	2.78	6	2.47
	Norm	35	55.56	101	56.11	136	55.97
	Overweight	17	26.98	51	28.33	68	27.98
	Obesity I	9	14.29	19	10.56	28	11.52
	Obesity II	1	1.59	3	1.67	4	1.65
	Obesity III	0	0.00	1	0.56	1	0.41
Taking hormone therapy replacement	Yes, in the past	3	4.76	7	3.89	10	4.12
	Yes, currently	5	7.94	22	12.22	27	11.11
	No	55	87.30	151	83.89	206	84.77
Last monthly period	≥ 12 months	23	36.51	66	36.67	89	36.63
	< 12 months	40	63.49	114	63.33	154	63.37

BMI – body mass index, N – the total number of individuals, % – percentage of the study group

The correlation between the last period and COVID-19 as a result of infection with the SARS-CoV-2 virus was analysed. The χ^2 test did not confirm the correlation, i.e. suffering from COVID-19 did not depend on when the last period occurred (Table 3).

The analysis of the correlation between body weight indicator (BMI) and going through SARS-CoV-2 infection did not show a statistically significant difference (Table 4).

Correlation between taking hormonal replacement therapy and going through SARS-CoV-2 virus infection was also investigated. The χ^2 test did not confirm such a correlation (Table 5).

Analysing the results of the research of symptoms connected to SARS-CoV-2 virus infection depending on

BMI, it was discovered that the most frequent symptom, independent of body mass indicator, was olfactory anaesthesia, which was reported by 77.14% of women with correct body mass, 76.47% of overweight women, and 70% of women with obesity. Fever occurred less often in the group of women with correct body mass (45.71%) compared to overweight women (70.59%) and obese women (70%) (Table 6).

In the analysis of symptoms connected with SARS-CoV-2 virus infection depending on the time after the last period, no significant difference was observed. In this case olfactory anaesthesia was also the most frequent symptom connected with SARS-CoV-2 virus infection (Table 7).

Table 2. Life quality vs. going through SARS-CoV-2 virus infection

Life quality according to WHOQOL-BREF	Women who did not go through SARS-CoV-2 virus infection			Women after SARS-CoV-2 virus infection			Total			Statistics
	M	n	SD	M	n	SD	M	N	SD	Spearman's coefficient
Level of satisfaction with one's life	4.12	180	0.779	4.06	63	0.821	4.10	243	0.788	$R_s = -0.029$, $p > 0.05$ ($p = 0.653$)
Level of satisfaction with one's health	3.80	180	0.794	3.57	63	0.777	3.74	243	0.794	$R_s = -0.120$, $p > 0.05$ ($p = 0.061$)
Physical domain	53.69	180	11.296	52.56	63	11.777	53.40	243	11.409	$R_s = -0.048$, $p > 0.05$ ($p = 0.453$)
Psychological domain	65.65	180	11.189	64.14	63	11.936	65.26	243	11.382	$R_s = -0.034$, $p > 0.05$ ($p = 0.599$)
Social domain	69.22	179	17.595	67.10	63	20.725	68.67	242	18.440	$R_s = -0.032$, $p > 0.05$ ($p = 0.623$)
Environmental domain	68.92	180	13.736	68.56	63	13.813	68.83	243	13.729	$R_s = 0.000$, $p > 0.05$ ($p = 0.997$)

M – mean, N – the total number of individuals, SD – standard deviation

Table 3. Correlation between when the last period occurred and going through SARS-CoV-2 infection

Going through SARS-CoV-2 infection	The last period					
	< 12 months		≥ 12 months		Total	
	n	%	n	%	n	%
No	114	74.03	66	74.16	180	74.07
Yes	40	25.97	23	25.84	63	25.93
Total	154	100.00	89	100.00	243	100.00

N – the total number of individuals, % – percentage of the total of the study group
 $\chi^2 = 0.001$, $df = 1$, $p > 0.05$ ($p = 0.982$)

Table 4. Correlation between body weight indicator and going through SARS-CoV-2 infection

Past SARS-CoV-2 virus infection	Body mass indicator							
	Norm		Overweight		Obesity		Total	
	n	%	n	%	n	%	n	%
No	101	74.26	51	75.00	23	69.70	175	73.84
Yes	35	25.74	17	25.00	10	30.30	62	26.16
Total	136	100.00	68	100.00	33	100.00	237	100.00

N – the total number of individuals, % – percentage of the total of the study group
 $\chi^2 = 0.353$, $df = 2$, $p > 0.05$ ($p = 0.838$)

Table 5. Correlation between taking hormone replacement therapy and SARS-CoV-2 virus infection

SARS-CoV-2 virus infection	Taking hormone replacement therapy							
	Yes, in the past		Yes, currently		No		Total	
	n	%	n	%	n	%	n	%
No	7	70.00	22	81.48	151	73.30	180	74.07
Yes	3	30.00	5	18.52	55	26.70	63	25.93
Total	10	100.00	27	100.00	206	100.00	243	100.00

N – the total number of individuals, % – percentage of the total of the study group
 $\chi^2 = 0.922$, $df = 2$, $p > 0.05$ ($p = 0.631$)

Discussion

The average lifespan has grown considerably, especially among women, and nowadays many of them

spend about one-third of their life after menopause. Therefore, research into the quality of life of women with menopause is very important for public health. This research takes into account the influence of quo-

Table 6. Symptoms connected with SARS-CoV-2 virus infection depending on body mass index

Symptoms connected with SARS-CoV-2 virus infection	Body mass indicator							
	Norm		Overweight		Obesity		Total	
	n	%	n	%	n	%	n	%
Olfactory anaesthesia	27	77.14	13	76.47	7	70.00	47	75.81
Fever	16	45.71	12	70.59	7	70.00	35	56.45
Cough	11	31.43	7	41.18	5	50.00	23	37.10
Fatigue	24	68.57	10	58.82	7	70.00	41	66.13
Muscle pain	22	62.86	12	70.59	6	60.00	40	64.52
Headache	21	60.00	10	58.82	6	60.00	37	59.68
Throat ache	7	20.00	3	17.65	2	20.00	12	19.35

N – the total number of individuals, % – percentage of the total of the study group

Table 7. Symptoms connected with SARS-CoV-2 virus infection depending on the time of the last period

Symptoms connected with SARS-CoV-2 virus infection	Time of the last period					
	< 12 months		≥ 12 months		Total	
	n	%	n	%	n	%
Olfactory anaesthesia	31	77.50	17	73.91	48	76.19
Fever	21	52.50	15	65.22	36	57.14
Cough	15	37.50	8	34.78	23	36.51
Fatigue	26	65.00	16	69.57	42	66.67
Muscle pain	26	65.00	14	60.87	40	63.49
Headache	26	65.00	12	52.17	38	60.32
Throat ache	8	20.00	4	17.39	12	19.05

N – the total number of individuals, % – percentage of the study group

tients that can impact life quality [8, 13]. Nowadays there is little evidence referring to data on the subject of life quality of women with menopause taking into account SARS-CoV-2 virus infection.

In the proprietary research it was shown that medical factors, such as body mass indicator, taking hormonal replacement therapy, or having a period, seem to have no meaning for SARS-CoV-2 virus infection. However Rodrigues *et al.* claim that oestrogen and progesterone therapy can be used to alleviate COVID-19 [3]. Also, Costeira [4] claims that women after menopause have a high level of oestrogen, and this may protect them from coronavirus.

Proprietary research shows that there is no correlation between life quality in all 4 life fields and SARS-CoV-2 virus infection in the group that does not consequently need hospital treatment. However, there is a slight correlation between the level of satisfaction with one’s life and SARS-CoV-2 virus infection. In the research done by Monterrosa-Blanco *et al.*, in a group of 984 Columbian women, it was shown that worse life quality appeared in a significant way in the somatic and psychological domains [19].

The analysis of the obtained results referring to the occurrence of symptoms after SARS-CoV-2 virus infection depending on BMI showed that fever appears less often in the group of women with correct body mass index

than in the group of overweight women or women with obesity. This analysis also showed that the most frequent symptom connected with SARS-CoV-2 virus infection was olfactory anaesthesia. Research results obtained by Nacar *et al.* showed that women after menopause who were diagnosed with COVID-19 experienced more menopause symptoms [20]. However, the authors did not perform the analysis of symptoms connected with SARS-CoV-2 virus infection, as opposed to the authors of the article. In the research by Mishra *et al.* no clear connection was noted between menopause and the result of COVID-19 [21].

Our own conducted research shows the relationship between being infected with the SARS-CoV-2 virus and becoming ill with COVID-19 and the quality of life of women in the perimenopausal period. A limitation to conducting research on a much larger group was the low availability of respondents. However, this research is a contribution to further analyses related to the post-COVID-19 situation. An analysis of the physical activity of women in the perimenopausal period and the severity of menopausal symptoms should also be performed.

Conclusions

No statistically significant connections were noticed between life quality of women with menopause who

went through SARS-CoV-2 virus infection and women who did not have the virus. No statistically significant differences were noticed between taking hormonal replacement therapy, BMI, and SARS-CoV-2 virus infection. No statistically significant correlations were noticed between the time of the last period and SARS-CoV-2 virus infection.

Disclosure

The authors report no conflict of interest.

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