Awareness of the Effects of Combining Smoking and Oral Contraceptives on Cardiovascular Health among Saudi Working Women

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Abstract

Background: There is a paucity of information in the medical literature on the awareness of the harmful effect of the combination of smoking and using oral contraceptive pills (OCPs) on cardiovascular health (CVH).

Objective: To evaluate this awareness among Saudi working women.

Methodology: This is a cross-sectional community-based study conducted on Saudi women working in the private sector. An international standard questionnaire was distributed electronically. Apart from the records of the patients' demographics, their cigarette smoking habits and use of contraceptive pills were also noted. The participants' awareness of the risk of combining smoking and OCPs and its effects on CVH was assessed.

Results: The study population consisted of 301 women who responded and answered the questions, with an age range of 21–30 years. While 77 (25.6%) women were using OCPs, only 13 (4.3%) were both smokers and users of OCPs. Overall, 256 (85.0%) women believed that smoking increases CVH risk. Additionally, 39.3% and 34.7% were aware that combined smoking and use of OCPs will lead to heart disease or risk of stroke, respectively, more than smoking alone, and 18% and 16.3% were aware that using OCPs alone can lead to heart disease and increase risk of stroke. There was no significant difference between women who used OCPs and smoked and those who did not use OCPs and not smokers. Only 66 (21.9%) of the participants were willing to use other means of birth control when warned that combining smoking and the use of OCPs was harmful.

Conclusion: The majority of the respondents were not aware of the effects on CVH when combining smoking and the use of OCPs. Public health awareness on this matter among Saudi women is therefore warranted.

Key words: Smoking, Oral contraceptive pills, myocardial infarction (MI), Stroke, and venous thromboembolism (VTE).

Introduction

Cardiovascular diseases (CVDs) are the leading cause of death among females(1,2). Both smoking and the use of oral contraceptives (OCPs) have a negative effect on cardiovascular health (CVH). Women who use OCPs and smoke have a 13.6-fold increased risk of myocardial infarction (MI) (3). A cohort study of 17,032 women aged 25 to 39 years old who used OCPs found that those who smoked were more likely to die than the non-smokers(4). Women who smoked and used OCPs were also more likely to have an ischaemic stroke than non-smokers who used OCPs(5). Furthermore, it is well accepted that smoking combined with the use of OCPs increases the relative risk of arterial and venous thromboembolic events (VTE)(6). Despite this synergistic adverse effect, women still remain unaware of the risks associated with OCPs(7,8). In a study conducted on undergraduate students to assess the perception of synergistic risk of combining smoking and OCPs, the respondents were apparently unaware of the possible synergistic nature of the risks associated with smoking and OCPs use(8). As a matter of fact, the American College of Obstetrics and Gynaecology recommends that physicians prescribe combination OCPs with caution in women older than 35 years who smoke (9).

There is an increasing trend of smoking among Saudi females (10,11). The Saudi Ministry of Health started a national tobacco control programme in 2002 and increased and intensified its efforts after joining the World Health Organization (WHO). According to the WHO, increasing women's awareness and knowledge of the CVH risks of smoking changes their actual risk and can thus improve their chances of living free of CVD or at least delaying it till later in life (12).

In Saudi Arabia, the prevalence of current smokers among females ranges from 4.2% to 11%, (13–16) being higher among college students (11%) than among medical students (2.4%) (13–16). Conversely, the reported use of OCPs among Saudi women varies among different cohort studies and has been found to be in the range of 31.8–64.9% (17). There are no data yet in the literature on the perception of the harmful effects of combining smoking and the use of OCPs among Saudi women. Therefore, it is important to assess the population's knowledge of the deleterious effect of combining smoking and the use of OCPs in order to implement preventive measures to improve community health, and consequently, this is an open topic for further research. We hypothesized that most Saudi women are not aware of the CVH risk from combining smoking and the use of OCPs. To date, there has been little written on this subject worldwide. Therefore, the aim of this study was to explore the awareness of the CVH risks of combining smoking and the use of OCPs among a group of working Saudi women.

Methodology

Study design

This was a cross-sectional community-based study. The data were collected from Saudi women working in the private sector. The study population comprised working women of reproductive age who were employees of a bank in Riyadh, Saudi Arabia. For the actual survey, the questionnaire was electronically distributed for completion on 15 January 2019 and collected on 15 February 2019.

The sample size was computed based on the single proportion formula N=Za-1*P (1-P)/D2 at a confidence level of 95% (two-sided) and a precision of 5%, Z=1.96, with the original number increased by 10% to compensate for possible losses in the sample size (301).

Inclusion and exclusion criteria

For the present study, women of child-bearing age (18–50 years old), whether or not they used OCPs or smoked, were asked to participate. For the evaluation of women's awareness regarding the risks of smoking and using of OCPs leading to adverse CV events, in total 301 women were included in the study. But for the evaluation of the awareness of combined use of OCPs and smoking on the effect on CVH, we selected women who were smoking and using OCPs and women who were not smoking and not using OCPs.

Questionnaires

The questionnaire utilized for the data gathering consisted of knowledge and perception items adapted from a modified structured global adult tobacco survey questionnaire (18). The survey questionnaire comprises 14 questions that were validated by four experts in this field for content validity and language simplicity, including a cardiologist, internist, gynaecologist, and epidemiologist. The suggested corrections were initially made. A pilot study, including assessing the test–retest reliability of the questionnaire, was initially performed on eight women smokers to get their feedback about the clarity of the questionnaire before the actual survey was conducted. Research team members were available during the questionnaire filling-in process just to help in case they needed clarification on any of the questions. Participants were informed that their participation was entirely voluntary, that the obtained information would be used for research purposes only, and that their personal data would be kept strictly confidential. Furthermore, the study protocol was approved by the ethical committee of King Saud University Medical City.

The questionnaire was available in both English and Arabic versions. The questionnaire was categorized into three categories: The first category covered the demographic data, such as age, marital status, and level of education. The second category covered the respondent's smoking habits, including the number of cigarettes smoked daily and their duration of use of OCPs. The third category covered their awareness of the risk of smoking to CVH and the CVH risk of using OCPs alone or combined with smoking.

Statistical analysis

The chi-squared test and Fisher exact test were used for the categorical values, the t-test and one-way ANOVA were used for continuous variables. A p-value of <0.05 was considered significant.

Results

The survey population consisted of 301 women who answered the questions and completed the questionnaire. Table 1 shows the characteristics of the study population. Most of the participants were 21 to 30 years old and had bachelor's degrees (74% and 85.7%, respectively). Only 13 (4.3%) of the participants used OCPs and smoked cigarettes, and 77 (25.6%) of the participants use OCPs. Only 66 (21.9%) of the participants were willing to use other means of birth control when warned that combining smoking and the use of OCPs was harmful. The percentages who smoked cigarettes, shisha, and e-cigarettes were 16.3%, 14.3%, 5.3%, respectively. The percentages with a history of previous heart attack, stroke, and venous thromboembolism were 0.7%, 0.3%, and 2%, respectively.

Table 2 shows the percentage of correct answers to the six questions about the awareness of the CVH risk of combined smoking and use of OCPs among Saudi working women. For all participants, it is clear that the Saudi women had a higher level of awareness that smoking can lead to heart diseases, with 256 correct answers (85.7%). Also, they had a good level of awareness that smoking can increase the risk of stroke, with 62% correct answers. On the other hand, relatively few were aware that combined smoking and use of OCPs will lead to heart disease or risk of stroke more than smoking alone (39.3% and 34.7%, respectively) or that using OCPs alone can lead to heart disease and increase risk of stroke (18% and 16.3%, respectively). There was no significant difference in the awareness of the correct answers among the women who used OCPs and smoked and those who did not use OCPs and did not smoke.

Table 3 shows the mean of the total score of awareness of the CVH risk of combined cigarette smoking and use of OCPs among Saudi working women by participants' characteristics. The mean for the total score of awareness was low, at 2.56 out of 6. It is clear that the awareness increased with age, and there is a significant difference between different age groups ($p < 0.001$). There is no significant difference regarding the educational level ($p = 0.625$). The women who smoked cigarettes or shisha had significantly lower awareness than those who did not smoke ($p = 0.002, 0.040$, respectively), but the women who had used OCPs before had significantly higher awareness than those who did not use OCPs ($p = 0.002$). The women who had had a stroke or VTE had a significantly higher level of awareness.

Dicusssion

To the best of our knowledge, this is the first comprehensive study from the Middle East to assess women's awareness of the effects on CVH of combined smoking and use of OCPs. The present study reveals a major difference in the knowledge and opinions regarding the risk of CVD associated with smoking and the use of OCPs (Table 2). The majority of Saudi women who were questioned were aware of the CVD risk of smoking, but most of them were not aware of the risk of combining smoking and using OCPs, nor even of the risk to CVH of using OCPs alone (39.3% and 34.7%, respectively). Similarly, they were not aware of the deleterious effects on CVH of using OCPs. These results show that, while there is good general knowledge that CVD can be triggered by certain risk factors, there are differing levels of awareness of what those risk factors are. Our findings are consistent with the previous study that suggested a perception gap among undergraduate students on combining smoking and OCPs and the risks of circulatory diseases (8). The lack of awareness of the effect of combined smoking and use of OCPs on CVH in this study is a concern in the presence of growing evidence that smoking is increasing among Saudi women (10,11). Furthermore, a study on the knowledge and safety of OCPs in a group of Saudi women showed that although these women had read the package insert, they found it hard to comprehend (19). It is well known that knowledge by itself will not change behaviour (20). These findings highlight the need to increase awareness about the health risk of smoking, particularly in women using OCPs. This may not be the case in all participants. Notably, we observed some level of awareness of the risk of stroke and VTE among women who used OCPs and who had a previous history of stroke and VTE, but there was a lack of awareness among women smokers concerning the risk of smoking to CVH (Table 3). Our results are in keeping with self-reported CV risk from France, where smokers represented one quarter of the study group, and the knowledge of CV risks to blood pressure (BP), glucose, and cholesterol levels was lower among smokers than non-smokers. They also observed a low level of knowledge of BP level among both women using oestrogen-progestin combined contraception and those smokers using OCPs (21).

Remarkably, only 3.4% of our study group currently smoked and used OCPs. This is much lower than in previous reports from other countries (22,23). A study performed in the U.S. found that 21% of women aged 35 years old were taking OCPs and smoking, while a Danish study found that 20% of women aged 21 years old were taking OCPs and were currently smokers (22,23).

The overall low level of knowledge of the risk of combining smoking and the use of OCPs observed in this study is worrisome. This consistently occurs in the context of the self-reporting of deep venous thrombosis and stroke. This concept is important, as most of the interviewees in the present study had bachelor's degrees and so could be considered highly educated and might be expected to be

Table 1. Characteristics of the Study Population

		Number (n=301)	%
Age	21–30 years	223	74.1
	31–40 years	49	16.3
	41–50 years	16	5.3
	More than 50 years	13	4.3
Educational level	High school	38	12.6
	Bachelor's	258	85.7
	Higher education	5	1.7
Using OCPs while smoking		13	4.3
Smoking cigarettes		49	16.3
Number of cigarettes daily	I do not smoke	219	72.8
	Fewer than 5	47	15.6
	5–10	24	8.0
	11–20	11	3.7
Smoking shisha		43	14.3
Smoking e-cigarettes		16	5.3
Using OCPs		77	25.6
Duration of using OCPs	I do not use it	224	74.4
	<6 months	29	9.6
	6–12 months	19	6.3
	1–5 years	17	5.6
	More than 5 years	12	4.0
Using OCPs before/during the period of smoking cigarettes	Yes	6	2.0
	No	295	98.0
Having a heart stroke	Yes	2	0.7
	No	299	99.3
Having a history of a stroke	Yes	1	0.3
	No	300	99.7
Having a history of VTE	Yes	6	2.0
	No	295	98.0
Would you like to use other contraceptives if the combination of smoking and OCPs is dangerous for your health?	Yes	66	21.9
	No	137	45.5
	Do not know	98	32.6

Table 2: Awareness of the Combined Use of Cigarette Smoking and OCPs on Cardiovascular Risk among Saudi Working Women

Items	ALL		Using OCPs while smoking		Not using OCPs and not smoking		p-value
	Correct answer		Correct answer		Correct answer		
	Number (n=301)	%	Number (n=13)	%	Number (n=133)	%	
Do you know that smoking leads to heart diseases?	256	85.0	11	84.6	109	82.0	0.582
Do you think that OCPs lead to heart diseases?	54	17.9	4	30.8	26	19.5	0.236
Do you think that smoking alone can increase the risk of stroke?	186	61.8	11	84.6	78	58.6	0.058
Do you think that combining the use of OCPs and smoking is more harmful to the heart than smoking alone?	118	39.2	5	38.5	52	39.1	0.964
Do you think that using OCPs alone can increase your risk of stroke?	49	16.3	2	15.4	26	19.5	0.528
Do you think that combining the use of OCPs and smoking increases your risk of stroke?	104	34.6	4	30.8	51	38.3	0.414

aware of the risks, but this was not the case here. It seems to go against the common perception that it is usually women with less education who have low knowledge of the CVD risk factors and thus might carry a greater disease burden. This is in parallel with the observation from the recent French study (21). After all, this may be attributed to the perception that certain individuals tend to underestimate their susceptibility (24). Interestingly, the majority of the respondents were not willing to change their oral pills to another form of birth control. This could be because birth control pills are convenient and can be acquired over the counter. Previous studies in Saudi Arabia and the region suggested that birth control pills are the most popular mode of contraception (25,26). Nevertheless, this suggests the need for a public health campaign on the risk of smoking and the use of OCPs. Future work in this area could assess how medical practitioners, in particular gynaecologists and epidemiologists, could better educate their patients about the possible association of combining smoking and the use of OCPs with the risk of CVD.

Limitations and strengths of the present study

The study has several limitations. The study was conducted in a special population of working women and may not be an exact reflection of awareness of the topic in the general population. The information was self-reported, and baseline comorbidities like obesity, dyslipidaemia, and hypertension among the three groups of smokers, non-smokers, and smokers also taking OCPs were not compared at baseline. The types and components of the specific OCPs were not investigated. The key strength of the study is that it is the first study performed in the region to determine women's awareness of the effect of taking oral birth control pills while smoking on the risk of developing harmful cardiovascular events. Future studies on this subject should include a wider spectrum of the population as standard.

Conclusion

Although most of the respondents were aware of the risk of smoking and CVD, there was a high rate of unawareness of the effect of combining smoking and the use of OCPs in relation to CV risk, which represents an alarming health problem among these women and requires increased public health awareness to prevent further serious diseases. The present survey-based study highlights the need for a strategy to increase knowledge, health education, and awareness of the risks of combining smoking and the use of OCPs and the risk of CVD. This strategy should include classes, training, and educational materials. Further studies on this subject are warranted.

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Table 3: Mean of the Total Score of Awareness of the Combined Use of Cigarette Smoking and OCPs on Cardiovascular Risk among Saudi Working Women by Participants' Characteristics**

		Mean	SD	p-value
Overall		2.56	1.60	
	21–30 years	2.33	1.45	< 0.001*
	31–40 years	3.00	1.89	
	41–50 years	3.38	1.89	
	more than50 years	3.77	1.48	
Educational level	High school	2.37	1.32	0.625
	Bachelors	2.58	1.63	
	Higher education	3.00	2.45	
Smoking cigarettes	Yes	2.21	1.68	0.002**
	No	2.69	1.56	
Smoking shisha	Yes	2.09	1.74	0.040*
	No	2.63	1.57	
Smoking e-cigarettes	Yes	2.50	2.28	0.919
	No	2.56	1.56	
Using OCPs	Yes	3.05	1.56	0.002*
	No	2.39	1.58	
Using OCPs while smoking	Yes	2.85	1.72	0.506
	No	2.54	1.60	
Have you ever had a heart attack?	Yes	2.50	3.54	0.960
	No	2.56	1.59	
Have you ever had a stroke?	Yes	6.00		0.031*
	No	2.55	1.59	
Have you ever had VTE?	Yes	3.83	1.72	0.049*
	No	2.53	1.59	
Would you like to use other contraceptives if the combination of smoking and OCPs is dangerous for your health?	Yes	2.73	1.47	0.202
	No	2.43	1.61	

** out of 6 (the score includes 6 items, each of which is worth 1 point; correct answer = 1, wrong answer = 0)
* Significant p-value

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