

Original Article

Risk of Heart Disease in Relation to Oral Contraceptive Pills among Premenopausal Women

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ABSTRACT

Women's cardiovascular risk is under-managed, particularly during the menopausal transition, when vulnerability to cardiovascular events rises. Cardiovascular disease (CVD) is the leading cause of death in women. The aim of the study was to assess the risk of heart disease in relation to oral contraceptive pills among pre-menopausal women. This case-control study was conducted in different chambers in Dhaka district during January 2020 to December 2020. A total of 211 participants were included for the study. Among them 106 women with HD (Heart Disease) were Group I and 105 women without HD (Heart Disease) were Group II. Respectively woman was assessed exclusively using a case sheet that include age, full medical history, past medical history (mainly hypertension), family history, smoking history & the use of oral contraceptive pill (OCP) and duration of use. Statistical analyses were done by using SPSS 19.0 for windows Inc. Mean age was 52.97 ±0.46 in women with HD and was 51.83 ±0.57 in women without HD. Women with HD age range 40-45 were 2.83% (3), age range 45-50 were 13.21% (14) and age range 50-55 were 83.96% (88). Women without HD age range 40-45 were 2.86% (3), age range 45-50 were 13.33% (14) and age range 50-55 were 83.81% (88). 82(77.36%) were women with HD and 50 (47.62%) were women without HD. Dyslipidemia 100(94.34%) were women with HD and 37(35.24%) were women without HD. of Hypertension 75(70.75%) were women with HD and 16(15.24%) were women without HD. Smoking 19(17.92%) were women with HD and 8 (7.62%) were women without HD. Family history of HD 70 (66.04%) were women with HD and 18 (17.14%) were women without HD. Use of OCP 71 (66.98%) was higher among women with HD as compared with those without HD 29 (27.62%). Duration of OCP was longer in

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women with HD than women without HD. *P* value was < 0.0001. The effect of OCP use in women with obesity 56 (59.6%) were women with HD and 21 (39.5%) were women without HD. The effect of OCP use in women with Dyslipidemia 62 (58.49%) were women with HD and 10 (09.52%) were women without HD. This study has confirmed the aforesaid findings in which the use of OCP increase the risk of HD in premenopausal women specifically in those who already have risk factors of HD. The effect of OCP use in women with Hypertension 51(61.5%) were women with HD and 6 (35.8%) were women without HD.

Keywords: Heart Disease, Oral Contraceptive Pills, Premenopausal, Estrogen.

INTRODUCTION

Women's cardiovascular risk is under-managed, particularly during the menopausal transition, when vulnerability to cardiovascular events rises. Women's cardiovascular disease (CVD) is the main cause of mortality, with a significant increase in risk after menopause with coronary heart disease developing several years later than men.¹ The use of oral contraceptive pills is widely spread in recent decades throughout the world due to simplicity of available regimens, low cost and more accepted by women compared to other non-hormonal contraceptive methods. Oral Contraceptive Pill prevent ovulation, implantation and therefore pregnancy by its action on endocrine system. Low levels of living because of lower security and socioeconomic states encourage women to use oral contraceptive pills, beside that the incidence of HD is increasing in younger age and in women, which attract our attention to study the relationship between the use of oral contraceptive and the risk of HD. Hypertension, dyslipidemia, obesity, and other components of the metabolic syndrome, as well as the prevention and careful treatment of diabetes, are key risk factors in peri-menopausal women. Hypertension is a very potent risk factor, and blood pressure control is critical. Because women are using oral contraceptives more often and for longer periods of time, there is a pressing need to better understand and reduce the cardiovascular risks associated with them.² Reproductive hormones affect the tone and function of blood vessels as well as lipid

(fat) levels in the blood. Low estrogen levels have been linked to an increased risk of coronary atherosclerosis (artery wall thickening and hardness) and "adverse cardiac events" such heart attacks and strokes. Supplemental estrogen, on the other hand, has been associated to an increased risk of blood clots, which can lead to heart attacks and strokes. Before beginning any contraceptive medication, health care practitioners must assess each woman's risk factors, particularly those connected to cardiovascular health. Despite the fact that pre-menopausal women have a decreased risk of cardiovascular disease, frequent screening and follow-up are essential.³ Subsequently 2000, death rates have increased in women between the ages of 35 and 44, while all other age groups have seen a decline. Increases in obesity and smoking, a drop in physical activity at this age, and a major increase in the use of oral contraceptives are all variables that may be contributing to the surge. Alternative types of contraception should be considered by women at high risk for cardiovascular issues, particularly those who smoke.² Any woman contemplating contraception should have her cholesterol, blood pressure, smoking, diabetes, renal disease, obesity, and other vascular illnesses checked. The aim of the study was to assess the risk of heart disease in relation to oral contraceptive pills among premenopausal women.

METHODOLOGY

This case-control study was conducted in different chambers in Dhaka district during January 2020 to December 2020. A total of

211 participants were included for the study. Among them 106 women with HD (Heart Disease) were Group I and 105 women without HD (Heart Disease) were Group II. Heart disease was diagnosed by specialist cardiology physician according to the European Society of Cardiology (ESC). Respectively woman was assessed exclusively using a case sheet that include age, full medical history, past medical history (mainly hypertension), family history, smoking history & the use of oral contraceptive pill (OCP) and duration of use. Complete physical examination and full investigations were done which include Electrocardiography (ECG). Blood Pressure measurement was done by mercurial sphygmomanometer recording. Statistical analyses were done by using SPSS 19.0 for windows Inc. The data were showed as means \pm SD or as numbers & percentages. P-values of < 0.05 were considered statistically significant.

RESULTS

Mean age was 52.97 ± 0.46 in women with HD and was 51.83 ± 0.57 in women without HD. Women with HD age range 40-45 were 2.83% (3), age range 45-50 were 13.21% (14) and age range 50-55 were 83.96% (88). Women without HD age range 40-45 were 2.86% (3), age range 45-50 were 13.33% (14) and age range 50-55 were 83.81% (88) (Table 1). 82(77.36%) were women with HD and 50 (47.62%) were women without HD. Dyslipidemia 100(94.34%) were women with HD and 37(35.24%) were women without HD. of Hypertension 75(70.75%) were women with HD and 16(15.24%) were women without HD. Smoking 19(17.92%) were women with HD and 8 (7.62%) were women without HD. Family history of HD 70 (66.04%) were women with HD and 18 (17.14%) were women without HD. Use of OCP 71 (66.98%) was higher among women with HD as compared with those without HD 29 (27.62%). Duration of OCP was longer in women with HD than women without HD. P value was < 0.0001 (Table

2). The effect of OCP use in women with obesity 56 (59.6%) were women with HD and 21 (39.5%) were women without HD (Table 3). The effect of OCP use in women with Dyslipidemia 62 (58.49%) were women with HD and 10 (09.52%) were women without HD (Table 4). The effect of OCP use in women with Hypertension 51(48.11%) were women with HD and 6 (5.71%) were women without HD (Table 5). The effect of OCP use in women with Smoking 13 (12.26%) were women with HD and 2 (01.91%) were women without HD (Table 6). The effect of OCP use in women with Family history 46 (43.4%) were women with HD and 6 (5.71%) were women without HD (Table 7).

Table 1: Age distribution of the study participants (n=211)

Variable	Women with HD (N=106)	Women without HD (N=105)
40-45	3(2.83%)	3(2.86%)
45-50	14(13.21%)	14(13.33%)
50-55	89(83.96%)	88(83.81%)
Mean \pm SD	52.97 \pm 0.46	51.83 \pm 0.57

Table 2: Women characteristics of the two groups (n=211)

Women Characteristics	Women with HD (N=106)	Women without HD (N=105)	P value
Overweight & Obese	82(77.36%)	50(47.62%)	$< 0.0001^*$
Dyslipidemia	100(94.34%)	37(35.24%)	$< 0.0001^*$
Hypertension	75(70.75%)	16(15.24%)	$< 0.0001^*$

Smoking	19(17.92%)	8(7.62%)	0.0123*
Family history of HD	70(66.04%)	18(17.14%)	<0.0001*
Use of OCP	71(66.98%)	29(27.62%)	<0.0001*
Duration of OCP (yr)	3.13±0.41	1.78±0.19	<0.0001*

Table 3: Women with Obesity & the effect of OCP use (n=211)

Groups of Overweigh & obese women	Use of OCP		Total
	Yes	No	
Women with HD	56 (52.83%)	50 (47.17%)	106 (100%)
Women without HD	21 (20.00%)	84 (80.00%)	105 (100%)
Total	77 (36.49%)	134 (63.51%)	211 (100%)

Table 4: Women with Dyslipidemia & the effects of OCP use (n=211)

Groups of Women with Dyslipidemia	Use of OCP		Total
	Yes	No	
Women with HD	62 (58.49%)	44 (41.51%)	106 (100%)
Women without HD	10 (9.52%)	95 (90.48%)	105 (100%)
Total	72 (34.12%)	139 (65.87%)	211 (100%)

Table 5: Women with Hypertension & the effects of OCP use (n=211)

Groups of HT women	Use of OCP		Total
	Yes	No	
Women with HD	51(48.11%)	55 (51.88%)	106 (100%)
Women without HD	6 (5.71%)	99 (94.28%)	105 (100%)
Total	57 (27.01%)	154 (72.98%)	211 (100%)

Table 6: Women with Smoking & the effects of OCP use (n=211)

Groups of Smoker women	Use of OCP		Total
	Yes	No	
Women with HD	13 (12.26%)	93 (87.73%)	106 (100%)
Women without HD	2 (01.91%)	103 (98.09%)	105 (100%)
Total	19 (7.11%)	196 (92.89%)	211 (100%)

Table 7: Women with Family history of HD & the effects of OCP use (n=211)

Groups of women with Family History of HD	Use of OCP		Total
	Yes	No	
Women with HD	46 (43.4%)	60 (56.60%)	78 (100%)
Women without HD	6 (5.71%)	99 (94.28%)	105 (100%)

Total	52 (24.64%)	159 (75.35%)	99 (100%)
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DISCUSSION

In this present study Women with HD age range 40-45 were 2.83% (3), age range 45-50 were 13.21% (14) and age range 50-55 were 83.96% (88). Women without HD age range 40-45 were 2.86% (3), age range 45-50 were 13.33% (14) and age range 50-55 were 83.81% (88). The average age of menopause is 48-52 years, but for some women it may occur as early as 40 or as late as 55 years⁴. In our study overweight & obese 82(77.36%) were women with HD and 50 (47.62%) were women without HD. Dyslipidemia 100(94.34%) were women with HD and 37(35.24%) were women without HD. of Hypertension 75(70.75%) were women with HD and 16(15.24%) were women without HD. Smoking 19(17.92%) were women with HD and 8 (7.62%) were women without HD. Family history of HD 70 (66.04%) were women with HD and 18 (17.14%) were women without HD. Use of OCP 71 (66.98%) was higher among women with HD as compared with those without HD 29 (27.62%). There are many prejudicing risk factors for induction of HD including a family history of HD⁵, prolong stress and other psychiatric disorder⁶, smoking^{7, 8}, obesity^{8, 9}, dyslipidemia^{8, 9}, hypertension⁸⁻¹⁰, diabetes^{9, 11}, and infections with certain microorganisms¹². It is usually rare to occur in women during the premenopausal age unless there are some predisposing risk factors especially diabetes that may lead to coronary artery disease^{8, 9}. In the present study, effect of OCP use in women with obesity 56 (52.83%) were women with HD and 21 (20.00%) were women without HD. Bastien et al¹³ showed that obesity is strongly related to other risk factors of HD such as hypertension, hypercholesterolemia and insulin resistance and it is a modifiable risk factor of HD. Obesity, on the other hand, is linked to the use of OCP, as

demonstrated by Mohammad NS et al,¹⁴ who discovered that the BMI of women taking OCP was considerably higher when compared to controls in their respective age groups. In our study, effect of OCP use in women with Dyslipidemia 62 (58.49%) were women with HD and 10 (09.52%) were women without HD. Women with managed dyslipidemia can use low-dose OCP with frequent monitoring of fasting lipid levels, according to Wells BG et al,¹⁵ whereas women with uncontrolled dyslipidemia or additional risk factors should use a different form of contraception. Skouby S. et al¹⁶ mentioned that OCP even in low dose causes decrease HDL and increase LDL, VLDL, and triglyceride. In this study, effect of OCP use in women with Hypertension 51(48.11%) were women with HD and 6 (5.71%) were women without HD. Mohammad NS et al¹⁴ and Wells BG et al¹⁵ showed that oral contraceptives may lead to raise blood pressure and increase the risk of hypertension which in turn can result in HD. In our study, effect of OCP use in women with Smoking 13 (12.26%) were women with HD and 2 (01.91%) were women without HD. Zahidullah M et al¹⁷ was proved that smoking acts synergistically with other risk factors to induce HD. As a result, the World Health Organization (WHO) announced that smoking is a risk factor for cardiovascular disease and that estrogen-containing contraceptives should not be used by smokers over 35 years old.¹⁸ In this present study, effect of OCP use in women with Family history 46 (43.4%) were women with HD and 6 (5.71%) were women without HD. Lloyd-Jones DM et al¹⁹ showed women who had family history of cardiovascular diseases may possess an increased risk of early occurrence of HD.

Limitations of the study

Sample size was small. The study was conducted in a single center which doesn't reflect the original scenario of Bangladesh. So here need a large multi scale, multi

center countrywide study for genuine outcome.

CONCLUSION

This study has confirmed the above-mentioned findings in which the use of OCP increase the risk of HD in premenopausal women specifically in those who already have risk factors of HD. The risk of heart disease was increased among women who used oral contraceptives. Cardiovascular events can be abridged by the management of risk factors. Mainly significant is the control of hypertension, lipids, and other factors contributing to the metabolic syndrome.

RECOMMENDATIONS

The management of premenopausal women is not only the duty of gynecologists, therefore we must be cautious. An interdisciplinary method should be adopted by the gynaecologist not just evaluating vasomotor and urogenital symptoms, but also assessing the patient for cardiovascular risk, and cardiovascular physician helping in the damaging treatment of women at increased risk of cardiovascular disease.

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