REVIEW ARTICLE

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Systematic Review of Cardiovascular Health Complications Associated with Oral Contraceptive Pills

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ABSTRACT: Women using oral contraceptive pills (OCP) are consistently found to be more at risk of cardiac problems. A considerable number of women may lead to death every year due to cardiac problems caused by OCP. Besides the series of health concerns associated with OCP, the public frequently uses OCP to avoid unintended pregnancy. This study aimed to review the previous epidemiological studies to discover the facts about cardiovascular health complications associated with OCP. Analysis of previous studies reveals that acute myocardial infarction (heart attack), venous thromboembolism, and liver tumours are the major cardiovascular problems associated with OCP. The available literature shows that using OCP after eating, using of anti-inflammatory foods, performing regular exercise, low intake of sugar and maintaining quality sleep are preventive measures for reducing the side effects of OCP.

Keywords: Cardiovascular Health Complications, Medicine, Oral Contraceptive Pills.

INTRODUCTION

OCP is a form of tablet containing estrogen and progesterone hormones. These hormones are used to prevent unintended pregnancy (Gupta et al., 2008; Thomas, 2015). These hormones cause the ovulation of egg from follicles instead of changing to make up of endometrial ling in the uterus in such a way that it becomes not receptive to the ovum in the uterus and also thick the fluid in the vagina, which make the movement of spar difficult and in this way chance of pregnancy become decreases due to the above mechanism of hormones present in the pills (Manzoor et al., 2022).

Many cardiovascular health problems, such as acute myocardial infarction (heart attack-Figure 1), venous thromboembolism and liver tumours, are associated with OCP (Sherif, 1999; Bassuk et al., 2015). The risk of cardiovascular health problems is higher in women using second-generation OCP as compared to first and second-generation (Tanis et al., 2001).

Acute myocardial infarction is myocardial necrosis and heart muscle death caused by acute coronary artery obstruction. It can be diagnosed with the help of electrocardiography (ECG) and the presence or absence of serologic markers (Sweis, 2022). The symptoms of acute myocardial infarction include chest discomfort with or without dyspnea, nausea, and/or diaphoresis. The figure below shows myocardial infarction caused by OCP

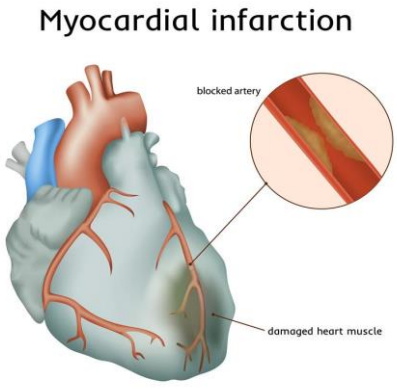

Figure 1. *Myocardial infarction*

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Women almost the age of 35 using OCP has at high risk of myocardial infarction. The cause of myocardial infarction in oral contraceptive users is thrombotic, not atherosclerotic. In addition, alteration in lipid profile is also associated with OCP (Oliver 1970). Thrombotic is a condition where blood clots block blood vessels. It has two types. i.e. venous thrombosis and Arterial thrombosis. When the blood clots block the vein, it is called venous thrombosis; thus, when the blood clots block an artery, it is called Arterial thrombosis (Zhou et al., 2021). Both states are shown in the below Figure 2.

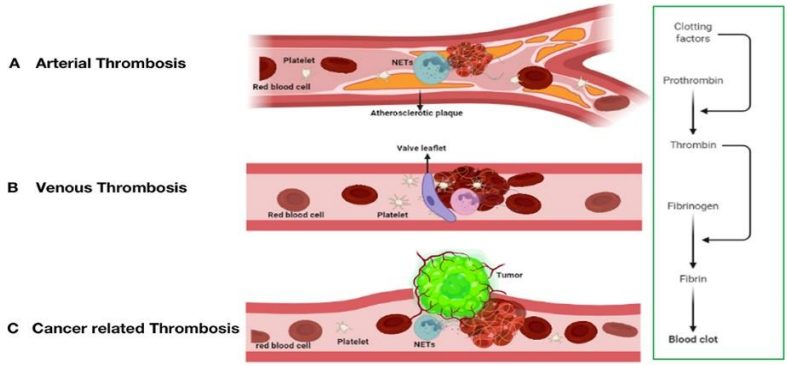

Figure 2. *Thrombosis*

The risk of venous thromboembolism is higher than in those not using OC (American College of Obstetricians and Gynecologists, 2012). Strategies formation for avoiding the side effects of OC is continued for a very extended period of time. Thus the association of ethinylestradiol with levonorgestrel should no longer be the only option for minimizing the risk of venous thromboembolism associated with combined OC use (Morimont et al., 2021).OC have no significant positive effect on the risk of liver cancer. The study showed that long-term use of OC can cause liver cancer as well as other health complication (An, 2015).

Excessive use of OCP increases the chances of liver tumours. Liver tumours may be of two types, i.e. adenomas and hemangiomas. The tumours made from blood vessels are known as hemangiomas cancers thus, adenomas are round-shaped tumours, usually benign (non-malignant) tumours, but infrequently can develop cancerously (Liver Doctor, 2023). The study by Hannaford et al. (1997) showed a higher risk of liver problems among women using OC containing more than 50 µg of estrogen. Nutritional supplements such as vitamin and mineral intake and, if warranted, consuming physiologic supplements of needed nutrients help reduce the side effects of OCP (Hannaford et al., 1997). Nutritional supplementations such as vitamins and minerals should be used with OCP to avoid side effects. The detail of nutrients with good sources for avoiding the side effects are given in the below table (Colorado State University, 2023).

Nutrients	**Sources**
Vitamin B-6	Fish, poultry, meat, whole grains, potatoes, sweet potatoes, brewer's yeast.
Folic acid	Liver, dark green leafy and stem vegetables, dried beans.
Riboflavin	Milk, meat, poultry, fish, dark green leafy vegetables, organ meats, enriched grains and cereals.
Vitamin C	Citrus fruits, juices, strawberries, cantaloupe, pineapple, broccoli, peppers, brussels sprouts, spinach, and cabbage.
Vitamin A	Green leafy vegetables (spinach, turnip tops, chard, beet greens), green stem vegetables (asparagus, broccoli), yellow vegetables (carrots, sweet potatoes, winter squash), yellow fruits (apricots, peaches, cantaloupe).
Iron	Meat, poultry, liver, fish, whole grain and enriched cereals and cereal products, dried beans and peas, prune juice, deep green leafy vegetables.
Zinc	Oysters and other seafood, meat, nuts, whole grain breads.
Copper	Oysters and other seafood, liver, nuts, dried beans and peas, dried fruits.

OCP increases inflammation in the body. Studies indicated that women with OCP have evaluated the level of C-reactive protein (CPR) as an inflammatory marker and thus it's caused pain during the monthly period, low moods, brain fog and general aches. To reduce the inflammation of OCP, it is essential to use more anti-inflammatory foods salmon, olive oil, green leafy vegetables, raw nuts, herbs & spices (Eve Wellness, 2023).

The menstrual cycle, OCP and exercise are all interrelated with each other. OCP affects the menstrual cycle similarly, the women performing exercise may be proven little to the side effects of OCP (Elliott-Sale et al., 2020). OCP causes a change in the menstrual cycle of women therefore avoiding OCP can help one to maintain her performance. In addition, regular exercise is vital for maintaining the usual monthly process of women (Elliott-Sale et al., 2020).OCP can potentially hurt blood pressure, insulin production and cardiovascular activities. Thus low-fat diet is considered essential for reducing the side effects of OCP (Straznick et al., 1998).

Women need more sleep as compared to men, and thus during the monthly cycle, women may face the problem of sleep. Similarly, sleep quality may be maintained with the help of hormonal contraception (Norelle Hentschel, 2019) Research evidence shows that quality sleep also helps reduce OCP's side effects

CONCLUSION

Epidemiological studies show that acute myocardial infarction (heart attack), venous thromboembolism, and liver tumours are the major cardiovascular problems associated with OCP. The available literature shows that using OCP after eating, using anti-inflammatory foods, performing regular exercise, eating a low sugar intake and maintaining quality sleep are preventive measures for reducing the side effects of OCP. In addition, alternative methods like a diaphragm, cervical cap, spermicides, male and female condoms and the sponge are considered a safe reference from a health point of view.

CONFLICT OF INTEREST

No conflict of interest was declared by the authors.

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