Medical Science

Adverse effects of contraception: A general overview

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ABSTRACT

The following is a brief overview of the potential adverse effects related to hormonal, mechanical, and natural methods of contraception have been summarized from the findings of recent peer-reviewed studies. Hormonal contraceptive is the most effective methods of birth control, but they can also have side effects, such as changes in mood, fluctuations in weight, as well as increased risk of thromboembolic events. Just like intrauterine instruments, mechanical methods can lead to local irritation, infections or device displacement in rare cases. By comparing outcomes from varied contraceptive methods.

Keywords: Contraception, adverse effects, contraceptive methods.

1. INTRODUCTION

Minimizing unintended pregnancies empowers individuals to fully engage in education and career opportunities, fostering economic stability for families and communities. Availability of diverse contraceptive methods and detailed education is essential in enabling individuals to make knowledgeable reproductive choices and tackling the wider societal issues related to unintended pregnancies (Teal and Edelman, 2021). Contraceptives provide a variety of benefits Grandi et al., (2021), unless their effectiveness can be affected by side effects. It can vary from minor discomfort to significant health risks. These issues often lead individuals to stop using contraception, consequently increasing the chances of unintended pregnancies.

To battle this, it is essential for healthcare professionals to deliver tailored, evidence-based advice that takes into account each individual's specific health requirements and lifestyle (Grandi et al., 2021). Contraceptive methods are generally categorized into hormonal, mechanical, and natural types, each with unique mechanisms of action. Hormonal contraceptives—such as oral pills, injectables, implants, and patches—function by inhibiting ovulation, thickening cervical mucus to obstruct sperm, and modifying the uterine lining to prevent

implantation (Brabaharan et al., 2022). Though they are highly effective, these methods could lead to side effects, like mood fluctuations, and an elevated risk of blood clots.

Non-hormonal contraceptive options include mechanical methods like intrauterine devices, and barrier methods such as condoms. IUDs are highly reliable; however, they can sometimes cause side effects, including pelvic discomfort, irritation, or infections. Most of all difficulties, such as uterine perforation or displacement of the device, may require immediate medical care (Claure et al., 2020). Barrier methods, while convenient and widely available, are less effective if not used correctly and consistently (Druetz et al., 2022). Natural contraceptive methods have grown in popularity due to their non-invasive approach.

However, they depend heavily on strict compliance and are less reliable compared to hormonal and mechanical methods (Teal and Edelman, 2021). Additionally, monitoring fertility can be stressful and may lead to dissatisfaction for some individuals. The side effects of contraception remain a primary reason for discontinuation. Around half of hormonal contraceptive users stop within the first year due to intolerable symptoms (Grandi et al., 2021). This emphasizes the importance of healthcare providers engaging in open discussions with patients to establish realistic expectations and address any potential concerns.

In addition to physical side effects, such as headaches or weight gain, emotional challenges like mood changes or reduced libido can also lead to dissatisfaction, especially with hormonal contraceptive options (Botzet et al., 2021). This review explores the harms linked to hormonal, mechanical, and natural contraceptive methods. This reader seeks to assist healthcare professionals in giving informed, patient-oriented guidance by compiling information from recent studies. Also calling attention to gaps in knowledge regarding the long-term safety and mental health effects of contraceptive use, it highlights the need for further research.

2. MATERIALS AND METHODS

This review utilizes a systematic approach to examine the adverse effects associated with various contraceptive methods. A complete literature search uses central databases, including PubMed, Scopus, and Web of Science. The search strategy aimed to capture a broad scope of studies by employing characteristic keywords such as "contraception adverse effects", "hormonal contraceptive complications", "mechanical contraceptive side effects", and "natural contraception efficacy". Boolean operators ("AND" and "OR") were used to refine the search results. To narrow the focus further, filters were applied to include only studies published in English between 2012 and 2023.

Study Selection

The following inclusion criteria were applied:

Studies investigating the adverse effects of hormonal, mechanical, or natural contraceptive methods.

Peer-reviewed articles, meta-analyses, and systematic reviews.

Original research involving human subjects aged 15–49 years.

Exclusion criteria included:

Studies with incomplete or ambiguous data.

Research on experimental contraceptive methods is not yet widely available.

Non-peer-reviewed sources such as opinion pieces or editorials.

Data Extraction and Categorization

Relevant data extract from the selected studies, including:

The type of contraceptive method investigated (hormonal, mechanical, or natural).

Reported adverse effects and their frequency.

Study design, population characteristics, and follow-up duration.

The extracted data were categorized into three groups based on the contraceptive method:

Hormonal methods: Addressing systemic results such as venous thromboembolism, weight changes, mood disruptions, and cardiovascular risks.

Mechanical methods: Focusing on localized effects, including pelvic pain, infections, and irritation.

Natural methods: Highlighting challenges like adherence issues and unntended pregnancies.

3. RESULTS AND DISCUSSION

The findings provide a comparative overview of the risks associated with each contraceptive category, helping healthcare providers make informed conclusions and improving patient care (Table 1).

Table 1 Risks associated with combined oral contraceptive use

Contraceptive Method	Associated Risk	Population at Greater Risk	Implication
Combined Oral Contraceptives	Twofold increased risk of venous thromboembolism	Individuals with preexisting risk factors (e.g., coagulopathy, obesity, smoking)	Emphasizes the need for thorough patient screening, particularly for those with underlying health conditions, to ensure safe use.

Hormonal methods

Hormonal contraceptives are widely used for their high efficacy and convenience. However, systemic side results are reported (Table 2).

Table 2 Common adverse effects associated with hormonal contraceptives

Adverse Effect	Details	Reference
Venous Thromboembolism (VTE)	Combined oral contraceptives (COCs), particularly those containing ethinyl estradiol, are linked to a two- to threefold higher risk of venous thromboembolism compared to non-users.	Brabaharan et al., 2022
Mood Disturbances	Hormonal contraceptive users, particularly those on high-dose methods, report psychological side effects like mood swings, irritability, and depressive symptoms.	Teal and Edelman, 2021
Weight Changes	Prolonged use of hormonal contraceptives has been associated with modest weight gain. On average, users experience an increase of 1–2 kilograms over two years. While not universally experienced, this change can influence perceptions of body image and satisfaction with the method.	Grandi et al., 2021

Hormonal contraceptives are very effective, yet they can direct to systemic side effects. These effects primarily stem from alterations in the body's coagulation pathways, which may heighten the chance of thromboembolic incidents. Mechanical methods, like intrauterine devices (IUDs), suggest useful long-term contraception but again come with their own group of challenges. For instance, copper IUDs are associated with a slightly elevated risk of pelvic inflammatory disease (PID), mainly during the initial period after insertion (Claure et al., 2020). Many users also report localized irritation and discomfort.

Furthermore, IUD expulsion or removal occurs in an estimated 5–10% of users, potentially leading to forced pregnancies or the need for reinsertion (Teal and Edelman, 2021). Also, barrier methods like condoms, while widely accessible and easy to use, can cause rage or allergic reactions in someones sensitive to latex or spermicides. Natural methods appeal to individuals seeking non-invasive options, but their success largely depends on the user's ability to adhere to behavioral practices. These methods eliminate many of the side effects associated with hormonal and mechanical options; however, they have higher failure rates, ranging from 12% to 20%, which increases the risk of unintended pregnancies (Druetz et al., 2022).

Users of natural methods often feel stressed or dissatisfied, largely because of the effort required to track fertility windows and strictly follow the guidelines. Every contraceptive option comes with its own set of advantages and challenges. Hormonal methods, for example, are effective but have systemic risks, like blood clots and shifts in mood, that need careful evaluation and monitoring. Mechanical means, such as IUDs and condoms, are reliable, but can result in localized issues, like irritation or infection or device movement. Invasive methods are considered to be the most effective but they also carry various system-wide side effects and often feel unpleasant to the user, while natural remedies.

Non-invasive techniques often lead to fewer systemic side effects. This patient-centered approach not only promotes safer contraceptive use but also enhances the overall experience and satisfaction of the patient. Hormonal contraceptives, despite their efficacy in preventing pregnancy and associated with a range of systemic results, including venous thromboembolism (VTE), mood alterations and weight changes. These risks are consistent with previous research indicating that the estrogen element in COCs significantly increases thrombotic risk (Brabaharan et al., 2022). Mechanical methods, such as IUDs, provide a valuable non-hormonal alternative, but can result in localised adverse effects, including infections and device displacement (Claure et al., 2020).

Despite the absence of artificial agents, natural methods remain the least reliable due to the high failure rates and the psychological burden associated with adherence (Druetz et al., 2022). The potential adverse effects of contraceptive methods highlight the necessity for personalized counseling in demand to optimize outcomes. It is incumbent upon healthcare providers, just viewing individual health profiles, lifestyle, and reproductive goals. It is of the utmost matter that patients receive comprehensive counseling on the potential risks and benefits associated with each contraceptive method, particularly for those at an elevated risk of complications, such as individuals with pre-existing cardiovascular conditions or a history of adverse experiences with contraception.

Such a non-hormonal alternatives or newer formulations with reduced side effect profiles, are the potential to enhance adherence and satisfaction (Grandi et al., 2021). The limitations of this review include the variability in study methodologies and the heterogeneity of reported data. A significant number of studies focus on the short-term adverse effects of contraceptive methods, thereby leaving considerable gaps in our understanding of their long-term safety profiles, particularly in the case of newer contraceptive formulations (Druetz et al., 2022).

The potential adverse effects of contraceptive methods highlight the necessity for personalized counseling in order to optimize outcomes. It is of the utmost significance that patients receive detailed counseling on the potential risks or the benefits of each contraceptive method, particularly for those at a higher risk of complications, such as those with cardiovascular conditions or prior adverse experiences with contraception. The studies concentrate on the short-term adverse effects of contraceptive methods, thereby leaving considerable gaps in our understanding of their long-term safety profiles, particularly in the case of newer contraceptive formulations.

4. CONCLUSIONS

This review provides a valuable examination of the various side effects associated with different contraceptive methods and their impacts on both physical health and mental well-being. While users may encounter challenges such as pelvic infections or complications from incorrect device placement, so the experiences highlight need for enhanced training and support to optimize the

use of these contraceptive options. Natural contraceptive techniques primarily rely on the user's commitment and precision, presenting an opportunity for increased education in this area.

It should be better equip individuals with the knowledge and resources needed to improve their effectiveness. Healthcare providers play a critical role in assessing individual health needs and discussing potential side effects, which empowers individuals to make informed and personalized choices. Studies that compare different hormonal methods indicate significant variaBy prioritizing these areas, we can work together toward developing more effective and safer contraceptive options for everyone.

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Author's Contributions
Piotr Wasiński: Conceptualization; writing - rough preparation; supervision
Natalia Dąbrowska, Martyna Koszyk, Paulina Kumięga, Zuzanna Kudas: Writing - rough preparation
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Data and materials availability
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