

Review article

How does contraceptive use affect women's sexuality?

A novel look at sexual acceptability

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Abstract: Among the components of a healthy life, sexuality is an essential part, contributing not only to psychophysical well-being, but also to the social well-being of women and, consequently to their quality of life. A poorly investigated standpoint is the acceptability of a contraceptive method, not only in terms of tolerability and metabolic neutrality, but also concerning the impact that it can have on sexual life. In this context, we will provide an overview of the different methods of contraception and their effects on female sexuality from the biological changes, to organic, social, and psychological factors, which can all shape sexuality.

A MEDLINE/PUBMED review of the literature between 2010 and 2021 was conducted using the following key words/phrases: hormonal contraception, contraceptives, female sexual function, libido, sexual arousal and desire, and sexual pain.

Recent studies have supported the effects of contraceptives on women's sexuality, describing a variety of positive and negative events on several domains of the sexual function (desire, arousal, orgasm, pain, enjoyment). However, satisfaction with sexual activity depends on factors that extend beyond sexual functioning alone. A more holistic approach is needed to better understand the multitude of factors linked to women's sexuality and contraception. Contraceptive counselling must necessarily consider these important elements since they are closely related to good compliance.

Keywords: hormonal contraception, long acting reversible contraceptive, quality of life, sexual arousal and desire, sexual behavior, short acting reversible contraceptive

1. Introduction

Reproductive and sexual health represent a human right that has to be defended and preserved. The aim of contraception is to avoid undesired pregnancy and to assure a satisfying sexual life free from procreative risks.

Successful control of fertility steers woman to great benefits from personal, economic and cultural autonomy, to the psychological and physical welfare and, consequently, to a better quality of her relationship with a partner [1].

A holistic approach to contraceptive requirement has to consider the individual's reproductive and sexual health needs. Physicians should use simple, understandable language when counseling about potential risks, benefits and uncertainties to enable women to

choose the best contraceptive for them. Different variables can affect the choice of contraceptive, as the woman's subjective characteristics, the ready availability and ease of use of the method [2].

The main goal of modern contraception has been to allow the woman, and the couple, to live the sexual experience free from the worry of an unwanted pregnancy. Although these good intentions, at least at the beginning of the use of hormonal contraception, the possible interference with the quality of sexual life, desire, arousal and the level of acceptability of contraceptive steroids have not been well investigated. In the past, few investigations have reported that hormonal contraception can positively or negatively affect the sexual function of users, affecting different domains of female sexuality, such as desire, arousal, orgasm, lubrication, enjoyment, pain [3].

However, it is important to emphasize that many factors beyond sexual function itself influence satisfaction with sexual activity. In fact, if on the one hand sociocultural variables can modulate female sexuality in its qualitative and quantitative aspects, it is also true that the hormonal changes promoted by hormonal contraception could influence sexual habits. [3]. Physiologically, in women who do not use hormonal contraceptives or who have taken non-hormonal contraceptives, sexual desire increases during the periovular phase of the menstrual cycle. [4].

Over the past decade, an increasing number of studies have been engaged in investigating the influences of contraception on sexuality, above all the association between hormonal contraception and libido.

Even so, a global approach is necessary to study the multifaceted female sexuality and the influence of contraception in users on it. Investigating these issues with greater interest than what has been done up to now, could bring benefits both to female sexual well-being and a wider use of hormonal contraception.

In this review we will focus on the different methods of contraception on the basis of their steroid compounds, route of administration, and regimen, and their impact on female sexuality, extrapolated from the most recent literature articles.

2. Materials and Methods

We conducted a comprehensive search of the literature using MEDLINE and PUBMED. The research covered the period from 2011 through 2021. We used combinations of the following search terms: female sexual function, hormonal contraception, libido, long acting reversible contraceptive, quality of life and short acting reversible contraceptive, sexual arousal and desire disorders, sexual pain, sexual behavior. Titles and abstracts were reviewed by the authors to assess their relevance to the review. Eligibility criteria included a comparison between two or more contraceptive methods and their influence in female sexual health, and the change of quality of life of users. Published guidelines on systematic reviews recommend a top-quality assessment of the included literature. The following criteria were used to exclude articles: unpublished reports, unspecified date and site of the study or suspicion of duplicate reporting. Efforts were made to make certain that there was no overlap within the results and no case was counted twice. Variables extracted and analyzed included improvement or worsening of sexual health, mainly of desire, arousal, lubrication and sexual pain.

This systematic review had not a "stand alone" study protocol. For reporting outcomes for the ongoing study, the PRISMA guidelines were adopted [Appendix A].

3. Results

We analyzed more than one hundred abstracts; however, sexual function and health were poorly investigated.

3.1. Combined oral contraception and sexuality

In the last fifty years, many studies have been drawn up on cultural and social aspects related to hormonal contraceptives [5].

Firstly, the impact of “the pill” on society has been misunderstood. Despite all the controversies of a social and moral nature, and also the scientific debate on side effects, hormonal contraception has nowadays obtained a consolidated role [6]. Combined oral contraception (COC) is a reasonable and reversible method of contraception, available with a wide modality of administration, and a wide choice of doses of administration, formulations and regimens.

However, in female sexuality it could have advantages, increasing intra-partner satisfaction and number of sexual intercourses, or resolving gynecological painful symptoms, due to dysmenorrhea or endometriosis, or bothersome symptoms such as menorrhagia and alterations in the menstrual cycle; or improving the signs and symptoms of clinical hyperandrogenism, such as acne and hirsutism [7]; but it could have disadvantages on sexual desire, arousal, lubrication, pain and orgasm. In fact, sexual side effects are considered one of the main causes for contraceptive discontinuation or switching [8].

Hypoactive sexual desire disorder is the most frequently reported sexual symptom of women on hormonal contraception. In a study on 3,740 women, the authors observed that 43% of them had experienced a reduction in sexual desire attributed to the use of hormonal contraceptives, compared with 12% of women who used hormone-free contraceptives [9].

To support these data there is also another Egyptian study on progestin-only contraceptives, which included 8422 women, in which a significant general worsening in sexuality for desire, arousal, lubrication, and orgasm was reported.

Smaller concentrations of estrogens and progestogen with antiandrogenic activity can lead to vulvo-vaginal atrophy due to reduced activation of sex steroid receptors, in case of relative lack of estrogen; conversely, the effects of reduced androgen concentrations have not yet been elucidated [10]. On the other hand, current hormonal contraception is characterized by a frankly antiandrogenic pharmacological activity due to the characteristics of both estrogen and progestin [11].

According to recent studies, the dose of ethinylestradiol (EE) can affect the blood levels of free testosterone (FT) reducing it below a critical threshold on the basis of its dosage, potentially lead, at least in one group of women, those most sensitive to steroid variations, to declare that they suffer from hypoactive sexual desire [12]. Its activity is coupled with the anti-androgenic activity of progestogen [13].

Just over 10 years ago, COCs containing natural estrogen, namely estradiol valerate (E2V) and 17 β -estradiol (17 β -E), were marketed. E2V and (17 β -E) have a lower impact than EE on the synthesis of hepatic proteins such as the sex hormone-binding globulin (SHBG) [14,15,16].

The assumption of a detrimental effect of the antiandrogenic progestogen on female sexual function was challenged by the STABLE study, a multicenter, randomized, double-blind, study to either E2V/Dienogest (DNG) or EE/Levonogestrel (LNG). Both treatments were associated with a significant increase in the sexual function of the users, between baseline and end-of-study, and resulted in similar improvements in desire, arousal, satisfaction, orgasm and lubrication [17].

These results are consistent with other studies investigating the effect of E2V/DNG on the quality of sex life of women who requested a contraceptive to avoid pregnancy [18]. Finally, hypoandrogenism induced by E2V/DNG is milder than that of other COCs containing EE combined with progestogen having antiandrogenic activity [15]. This could be caused by two mechanisms as follows: EE can raise the level of the SHBG and conse-

quent decrease in FT; however, they can directly suppress the ovary androgen production [19]. Moreover, continuous or extended regimens of administration have been associated with supplementary positive variation in a multitude of sexual acceptability factors, from sexual function and libido to a reduction in dysmenorrhea, duration of withdrawal bleeds and breast tenderness [12]. It is also true that most of the users of hormonal contraceptives don't undergo reduction of libido even though in most studies a decline in plasma levels of FT and an increase of SHBG were demonstrated [20]. Pastor et al. showed that libido was decreased only in women using oral contraceptives containing 15 µg EE but not in those on COCs containing 20 or 35 µg EE. Nonetheless, the reduction of vaginal lubrication with sexual arousal disorder complained by some users could be due to the low peripheral dose of EE [21]. Experiencing reduced desire seems to be a strong predictor for changing or suspending contraceptive method [22].

On the other hand, several studies correlate the use of COCs and changes of sexual function, particularly sexual desire and arousal, frequency of sexual activity and orgasm achievement but not enjoyment with sexual activity [22,23].

However, it is still unclear whether these changes in sexuality are directly related to hormonal effects or pill-induced mood swings, or are primarily psychological rejection reactions to fertility control. [20].

Another factor that can positively influence women's sexuality is the certainty of not wanting children. Hormonal contraceptive are a highly effective form of contraception, they help to eliminate anxiety related to the fear of pregnancy, encouraging an easier and more enjoyable sexual experience. Differences in terms of anti-androgenic results and influence on sexuality could be attributed in part to the known effects of estrogen on SHBG synthesis and in part to the androgenic or anti-androgenic activity of the involved progestin [24]. In conclusion, every woman has her own sensitivity to sexual steroids, therefore it is not possible to simplify the contraceptive choice: an effort is strongly required to adopt a hormonal contraceptive that must be adapted to her subjective needs. It is essential that the counseling considers the woman's expectations on the effects of hormonal contraception on her own sexual activity. In fact, most of them expect an improvement in sexuality when are on hormonal contraception; a worsening or the lack of changes could lead to discontinuation [25].

3.2. *Vaginal Ring and sexuality*

The contraceptive vaginal ring (CVR) is an appropriate method for women with indications for hormonal contraception (HC) who have previously experienced sexual dysfunction using oral contraceptives [26].

Many studies that compare COCs and CVR report that there is no difference in terms of efficacy to inhibit ovulation. The only difference is the compliance of women, maybe also thanks to the elimination of daily intake [27].

Some authors have shown that CVR, in addition to contraceptive efficacy, could promote a positive effect on the couple's sexuality as a whole, and amplify the complicity and satisfaction of both the partners. [28].

Furthermore, in previous studies, women using CVR had better outcomes in relation to desire and sexual satisfaction than compared with women that were using oral hormonal contraceptives. In fact, CVR users had higher sexual desire than those were using oral contraceptive combined to EE or desogestrel-only pill [29].

In addition, other authors evaluated sexual efficacy and function by a prospective study involving a prolonged regimen of CVR. An improvement in sexual function and a reduction in sexual discomfort were observed after two months of use [30].

Unlike these, other investigation obtained conflicting results. Indeed, decreased sexual desire was observed more frequently in women using CVR than in those that were in-taking oral contraceptive containing 30 µg EE and 3 mg DRSP [31]. Today, new polymer compositions are produced for their use in the manufacture of CVRs. Their characteristic is to give greater stability and a better withdrawal of steroids from the CVR. In addition to having reduced adverse events, such as spotting, the users report a better QoL and sexual function when interviewed [32].

In favor of these data there are many comparisons between the vaginal ring, other types of contraception, and no hormonal contraception. Women who use an HC through any route of administration experience an improvement in their sexuality, evidenced by positive variations of sexual interest and fantasies, orgasm intensity and satisfaction; however, they report a reduction in their anxiety and discomfort of unprotected sexuality [17,33].

3.3. Progestin-only pill (POP) and sexuality

During breastfeeding, the most common contraceptive used in Europe is a POP that contains low doses of desogestrel. Clinical trials on POPs has proved no effects on breastfeeding performance and consequently no harmful events on breastfed newborns [33]. Authors noted in a double-blind, placebo-controlled study that POP users have no adverse effects on sexual function, compared to women using HC. Overall, data provide reassurance that POP are improbable to have a major impact on sexual desire [34]. However, some authors have postulated that progestogen POPs having antiandrogenic activity may adversely affect sexual interest and fantasies. The findings of the studies reinforce the hypothesis that the effect on sexual function depends on the particular type of progestin, and not its dosage [35]. Reports correlating a levonorgestrel-containing combined contraceptive with a desogestrel-containing one have shown different impacts on SHBG concentrations [36]. Moreover, it has been proposed that desogestrel, for its androgenic activity, may have exert positive effects on libido [37]. The question about a different dose or the type of progestins could in a different way affect female sexuality is worthy of additional research.

3.4. Intrauterine devices and sexuality

The high contraceptive efficacy of long-acting reversible contraceptives (LARC) are the most important characteristics of this kind of contraceptive. For this reason they are widely used in current programs and policies of family planning [38]. Nowadays, nowadays, women who use SARCs, such as oral, patch or vaginal combined hormonal contraceptives, or non-hormonal contraceptives, and who have had incorrect or discontinued use in their history, with the risk of having an unwanted pregnancy, could adopt a LARC [39].

An important aspect that could influence happiness with and prolongation of LARCs is sexual acceptability. Cramps, pain, and bleeding are the most commonly cited reasons from women for discontinuation within the first 12 months, even if they are adverse events that usually appear during the first months of use [40]. The partner could also influence the acceptability of the LARC when he experiences a bad sexuality due to the perception of the LARC string during intercourse [41]. Conversely, the absence of systemic hormonal repercussions makes these LARCs neutral on sexual libido compared to other hormonal methods [42]. However, authors have shown by their investigation that

the QoL and sexual function improve after LNG-IUS placement. Moreover, the reduction of dysmenorrhea is another important reported aspect [38,43].

Both frequency of sexual activity and sexual enjoyment are positively related to satisfaction with a contraceptive method, as is demonstrated in other studies [44,45]. High standards of satisfaction [44] and a better QoL [46,47] have been described in LARC users who previously have had unwanted pregnancies using a SARC. Furthermore, Authors observed that women with sexual dysfunction experience significant improvement in sexual desire, arousal, orgasm and overall sexual function while using LNG-IUS. Based on this finding, LNG-IUS could be a proper choice for women who have had sexual dysfunction with the use of oral hormonal contraceptives [48]. Moreover, a cross-sectional investigation, studying 402 women, observed that sexual symptoms in those using a LNG-IUS were the same as those of women who adopted a copper intrauterine device (IUD) [49].

These data are also supported by other recent studies in which healthy women who were using LARC for long-term contraception were enrolled. Among them, half used LNG-IUSs as the study group and the other half used copper IUDs. There was no significant difference in the individual score and total scores of questionnaires used to investigate sexual function between the groups [44,50]. At first, intrauterine LARCs were not thought to be proper for adolescents until observational studies showed not only their contraceptive safety but also their positive role on sexuality. Therefore, new, smaller devices have allowed the doctor to suggest and the adolescents to be able to use intrauterine contraception. Finally, intrauterine device does not appear to have negative interference during sexual experience, due to the absence of systemic steroid effects: it maintains the natural expression of sexuality and enjoyment during sexual intercourse. [51].

3.5. Progestin contraceptive implant and sexuality

Progestin only contraceptive implants (POI) are subdermal devices composed of a total of 68 mg of etonogestrel (ENG), which is liberated daily at low doses 25–70 μ g on the subdermal tissue of the arm. It has the advantage of being discreet and easy to use and it is classified as a LARC [52]. Some studies showed an improvement of QoL and no negative effects on libido and sexual function [49,53]. Relevant benefits on sexual function were also observed, consisting in increase in sexual pleasure, personal initiative, orgasm experience, and satisfaction; authors argued that these benefits were due to decreased anxiety and discomfort [54]. In comparative studies, a greater sexual interest was observed in users of RNG implants than in users of oral contraceptives [55].

4. Conclusions

During the counseling to prescribe a contraceptive, the health care practitioner (HCP) should investigate the woman's quality of sexual life, so as to work out together the method that could maintain or improve her sexuality. At the follow-up, shared with the user in time and manner, it will be necessary to reassess the impact of the adopted method on sexuality and, if disturbing effects on sexuality are highlighted, opt for another contraceptive. Again, the choice of the new method must take into account the woman's propensity, and its impact on sexual function. Not infrequently, women may manifest anxiety when they experience their sexuality disturbed by the hormonal contraceptive. A review of a temporal association between the baseline of female sexual dysfunction and the introduction of contraception is warranted, as is an assessment of the bio-psycho-social exemplar of other implicit contributing elements. When direct disturbing effects of the adopted contraceptive on sexuality are not recognized, a multidisciplinary approach becomes necessary. In fact, pain during vaginal intercourse, marital conflict, or medical surgical comorbidities, or a history of sexual abuse may emerge during contraceptive counseling. A specialist consultation must be requested for each of them.

For all these reasons developments in oral contraception are continuing. One hormonal contraceptive cannot be the solution to all problems. In our experience, COCs containing E2 are an innovation that avoids CHC discontinuation in women suffering from acquired hypoactive sexual desire disorder during CHC intake having hypoandrogenic effects [15]. Consequently, the concept that all women are distinct and variably sensitive to COC steroids has to be emphasized; in fact, we are going into a historical period in which the principal concept is to advise a tailored COC to a particular woman. Therefore, the first step in prescribing a COC is to understand the needs of the subject and to explore her current sexual health.

Therefore, if healthcare professionals are adequately trained to treat endocrine and gynecological disorders with hormonal contraceptives, such as chronic pelvic pain, dysmenorrhea, or hyperandrogenism, on the other hand they have evident gaps in addressing their patients' sexual distress or sex disorder. To overcome these gaps, it is necessary to train in sexual medicine and to promote better sexual well-being, including in the contraceptive field.

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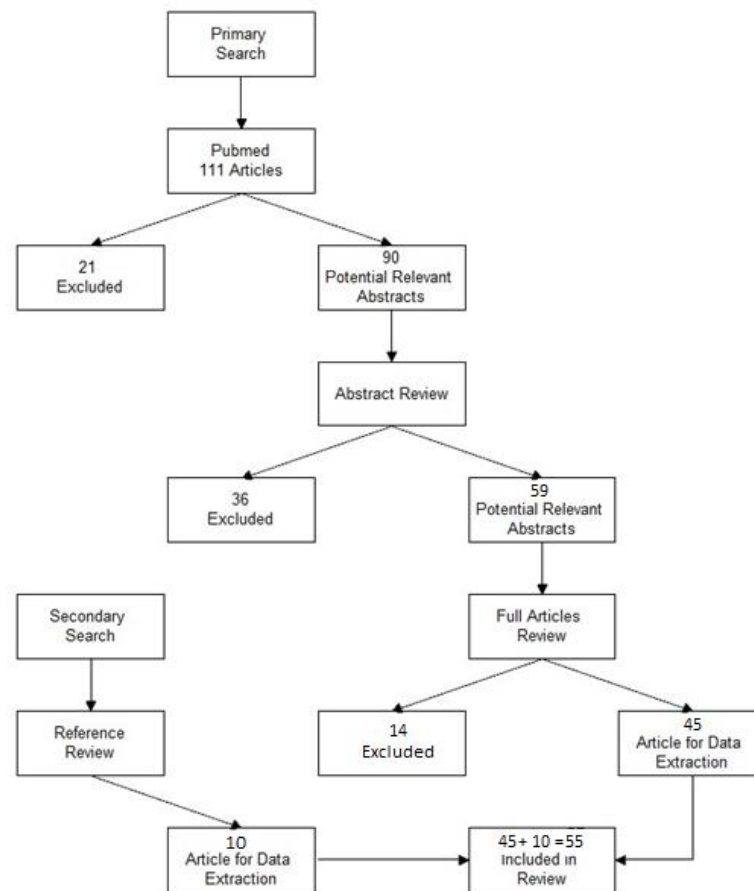
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Appendix A



Appendix A: PRISMA Flow Diagram. References

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