




Contraception Use in Cancer Survivors, Clinical Practice and Patients' Preferences

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Abstract: Current literature suggests that emergency contraception, defined as a therapy aimed at preventing an unwanted pregnancy after unprotected or insufficiently protected intercourse, is used more by cancer survivors than by the general population. This may be related to reduced use of contraception in women after cancer diagnosis and, when it is used, to a choice of less effective methods, even in the absence of contraindications to hormonal options. The purpose of this review is to analyze the use of contraception in these patients, its predictors and the preferred methods, as well as to try to define timing and characteristics of an effective contraception counseling. Factors identified as predictors of contraception usage were younger age, having a partner and better sexual function, having children, past use and having received contraception counseling by a gynecologist, especially in the previous year. Contraception counseling should start before oncological therapies, together with information regarding fertility and sexual health, preferably by the gynecologist of the oncofertility unit, with a specific expertise in dealing with cancer patients. Increased awareness of oncologists and family medicine doctors is fundamental to optimize contraception use and compliance with the prescribed method. Major guidelines regarding oncological care in women of fertile age already recommend contraception counseling, but optimal timing and mode of the consultation(s) options should be further researched, to be better detailed in all relevant documents.

Keywords: cancer survivors, contraception after cancer, emergency contraception, contraceptive counseling, fertility counseling, oncofertility unit

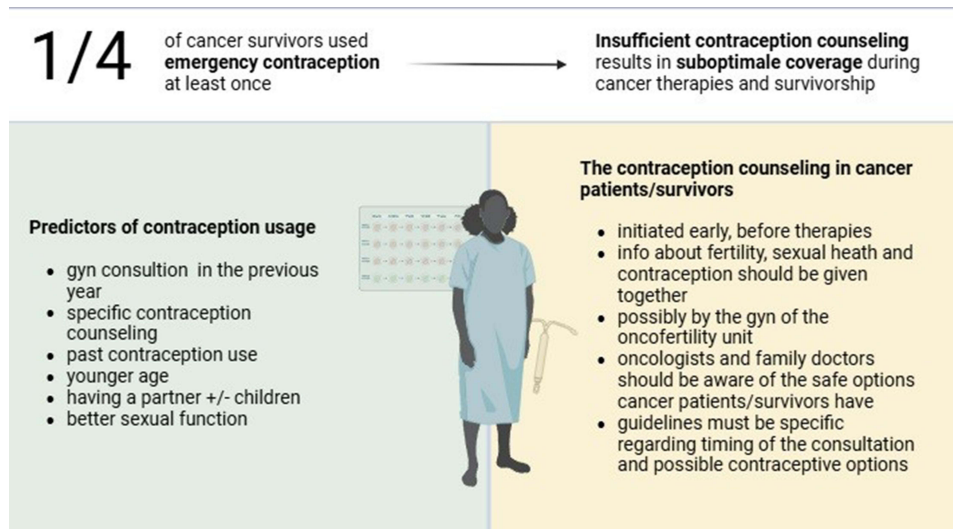
Introduction

Contraception counseling in cancer survivors is a fundamental part in the counseling of cancer survivors of childbearing age, and it is a very current topic, especially with the increasing number of woman facing cancer at reproductive age.¹ Indeed, while some oncological diagnoses are increasing, so is survival rates.^{2,3} Therefore, crucial attention should be paid to survivorship issues since the time of diagnosis and along the whole cancer care trajectory.⁴

Anticancer treatments, such as radiotherapy and chemotherapy, can affect fertility in women of reproductive age, up to inducing premature ovarian insufficiency (POI) in some patients, but most of them retain their fertility⁵⁻⁷ and the availability and consolidation of fertility preservation techniques can increase patients' chances of fulfilling their reproductive desires even after gonadotoxic treatments.⁸ The likelihood of developing POI depends on patient's age and ovarian reserve at diagnosis,⁷ on radiation therapy field (abdominal pelvic radiation; total body irradiation) and dose,⁶ as well as on type and dose of chemotherapy.⁹

Amenorrhea during anticancer therapies is common, both induced by the treatments themselves or by the treating physician using LHRH agonists to preserve ovarian function.^{10,11} Menstrual resumption may happen immediately, in a few months, or up to one or two years after completion of treatment.^{12,13} The absence of menstruations does not equate to the absence of fertility, since the first ovulation may happen before the first menstruation.

Graphical Abstract



Given that a cancer diagnosis does not always coincide with the loss of reproductive function, it is useful to provide women with a complete counseling regarding safe and effective contraception options, both during and after treatment, to avoid unintended pregnancies.

In 2018, a cohort study demonstrated that 40% of cancer survivors have used emergency contraception at least once, 26% twice, and 34% three times.¹⁴ Such rates are significantly higher than those in the general population, likely being a consequence of reduced used of contraception related to fear of hormones or incorrect beliefs regarding their fertility status.^{14,15}

Materials and Methods

The main objective of this narrative review is to examine the available data on contraception use in cancer survivors, including possible predictors of use and preferred methods.

We conducted an extensive literature search using PubMed library up to May 31, 2024. The search strategy was conducted, including multiple combinations of terms: “contraception” OR “emergency contraception” OR “contraception counseling” AND “breast cancer” OR “breast tumor” OR “cancer survivors”. All research articles reporting contraception use rates in cohorts of cancer patients/survivors were included in the review. Selected articles were verified by two separate authors, and discrepancies were discussed within the team.

According to the World Health Organization, tiers of contraceptives in relation to their effectiveness in preventing pregnancy are the following: tiers I–II include female and male sterilization, intrauterine device, oral contraceptive pill, and other hormonal methods such as implants, patch and vaginal ring; tiers III–IV include male and female condom, diaphragm, fertility awareness methods (ie abstain or use condoms on fertile days), withdrawal and spermicides.¹⁶ Even if the effectiveness of the method decreases as the tiers increase, even the least effective method is still more effective than unprotected sexual intercourse.

Results

Literature reports on how emergency contraception is used more frequently by cancer survivors compared to the general population, particularly by patients with breast cancer, older women, and those who did not receive adequate family planning services such as counseling, prescriptions, or procedures related to birth control before starting the oncological therapies.^{14,15,17,18} Medica et al, who report a rate of emergency contraception use as high as 25.5%, also explained that

the predominant reason for it was the low use of regular contraception: 60% of patients had an unprotected intercourse and 43% feared the method used would fail.¹⁴ The majority of patients included used emergency contraception more than 5 years after cancer diagnosis (69.9%).¹⁴ Two other groups report on the use of emergency contraception in this population: Dominick et al report that 10% out of the 295 surveyed cancer survivors used emergency contraception,¹⁷ and Sebbag et al had a lower 4.4% rate (online survey of 517 breast cancer survivors), detailing that the method used was a pill and not an intrauterine device and reporting the protective effect of counseling at the time of the diagnosis.¹⁸

The available data emphasize the need to understand the reasons for the more frequent use of emergency contraception among cancer survivors, which, although effective, must take second place compared to other stable and more effective contraceptive options.

We therefore review the rates of use of regular contraception, the contraceptive methods preferred by these patients and the characteristics of counseling. We identified 12 studies reporting on contraception in cancer survivors,^{14,15,17–26} of which 5 were focused on breast cancer^{18,22–24,26} and the others included all types of cancer. Table 1 summarizes all the studies examined.

Contraception Use Among Cancer Survivors and Its Predictors

Across the studies, contraceptive use among cancer patients demonstrated substantial variability, with usage rates ranging from 36% to 90%, depending on the population studied and the type of contraceptive counseling provided.

One of the first studies on this topic, although on a small sample of patients, showed that only 55% of cancer survivors used contraception and half of them relied on abstinence as a method.¹⁹ Later studies with larger samples have shown a similar trend: Quinn et al surveyed 981 patients and reported 46.6% used contraception, while 21% of the patients who did not wish to become pregnant reported having had unprotected intercourse and being therefore at high risk of unintended pregnancy.²¹ Studies including patients with breast cancer found even lower percentages of contraception use: 36% for Kopeika et al,²³ 38.9% at year 1 and 41.2% at year 2 for Lambertini et al;²⁶ 45.7% for Castro-Sanchez et al.²² This issue is not only a survivorship concern: Castro-Sanchez reported a low contraceptive use also during chemotherapy, with only 29.4% of sexually active patients using a tier I contraceptive method.²²

Other studies report a different and better experience. Mody et al, through an online survey directed to 150 breast cancer survivors, found that up to 61% of the patients discussed the safety of contraception with their oncologist, and the percentage using contraception was as high as 90%.²⁴ Regardless of the preferred method, a gynecological consultation was fundamental as a high percentage (49%) of patients who discussed contraception with their oncologist only did not then receive a prescription, which is in fact the gynecologist's job to carry out.²⁴ Coherently, in the study by Maslow et al, 76% of cancer survivors answered to an online survey they were using contraception. However, it has to be noted that when asked about the method used, one-fourth of them answered it was abstinence.²⁰ Hadnott and Sebbag also reported high rates of contraception usage (84% and 78.9%), linking it to having received correct information about their fertility status and therapies' gonadotoxicity.^{15,18}

Out of the 12 articles included, nine included predictors of contraception use.^{14,15,17,18,20,22,24–26}

Having received a dedicated contraception counseling with a gynecologist was listed as predictive factor by four of them.^{14,17,22,25,26} Lambertini et al showed in a sample of 2900 patients with breast cancer that contraceptive use decreased significantly after diagnosis, but past use was one of the factors that favored continued use.²⁶ Other factors associated with contraceptive use in literature include younger age,^{25,26} having a partner,^{25,26} having better sexual function,²⁶ and having children.²⁶ According to Hadnott et al, non-use of contraception was more common among survivors who perceived themselves as infertile.¹⁵ Factors specific for breast cancer patients that were associated with contraceptive use were receiving tamoxifen as the only adjuvant treatment²⁶ and using anti-HER2 treatment.¹⁸

Contraceptive Methods Used and Preferred by Cancer Survivors

Ten out of twelve of the included studies reported the contraception method used.^{15,17–22,24–26} The studies reviewed revealed a diverse array of contraceptive methods used by cancer patients, with a notable preference for non-hormonal options, also in patients without hormone sensitive cancers.^{17,25} Abstinence and barrier methods were only frequently listed as contraception of choice.^{19,20,25}

Table 1 Studies Reporting on Contraception in Cancer Patients

Authors, Year, Country	Design	N° of Patients	Age (Years)	Cancer Type	Contraception Use	Contraceptive Methods	Unwanted Pregnancies	Predictors of Use
Patel AR et al, 2009, USA ¹⁹	Quantitative, cross-sectional survey	20	15–44	All	55%	55% abstinence only, the others barrier methods	NA	NA
Quinn MM et al, 2014, USA ²¹	Written or online survey	918	18–40	All	46.6%	71% Tiers I/II 29% Tiers III/IV	21% of women who had resumed menstrual bleeding were at risk of unwanted pregnancies (unprotected intercourse)	NA
Maslow BS et al, 2014, USA ²⁰	Online survey	107	18–45	All	76%	25% abstinence only 35% Tiers III/IV 27% Tiers I/II	NA	Receiving contraception counseling
Dominick SA et al, 2015, USA ¹⁷	Annual online or telephone survey	295	18–44	All	57%	34% Tiers I–II 23% Tiers III–IV	10% used emergency contraception	Receiving family planning counseling
Medica et al, 2018, USA ¹⁴	Retrospective cohort study	616	18–40	All	40%	NA	25.3% used emergency contraception	Receiving family planning counseling
Castro-Sanchez et al, 2018, USA ²²	Cross-sectional survey	104	18–40	BC	51.1% during chemotherapy 45.7% during other treatments	29.4% Tier I	0 unwanted pregnancies	Receiving contraception counseling
Hadnott TN et al, 2019, USA ¹⁵	Online survey	483	18–40	All	84%	49.7% Tiers I/II	NA	Not perceiving themselves as infertile due to therapies
Mody SK et al, 2019, USA ²⁴	Online survey	150	18–50	BC	90%	27.6 Tiers I/II 72.4 Tiers III/IV	5% unwanted pregnancies among women who reported a previous pregnancy	Reassurances about safety by the oncologists
Kopeika J et al, 2019, UK ²³	Questionnaire during their follow-up visit	175	18–43	BC	36%	NA	6.8% unwanted pregnancies	NA
Massarotti C et al, 2020, Italy ²⁵	Retrospective analysis, after contraception counseling	280	27–35	All	All received counseling and a prescription	44.3% Tiers III/IV	NA	Age <33 years old Being in a relationship

Lambertini M et al, 2022, France ²⁶	Longitudinal evaluation	2900	18–50	BC	38.9% at year 1 41.2% at year 2	5.8% use hormonal methods despite breast cancer diagnosis; between nonhormonal methods: 85.2% Tiers I/II, 14.8% Tiers III/IV	NA	Prior contraceptive use Younger age Better sexual function Having children Leukorrhea Use of tamoxifen Gyn counseling
Sebbag G et al, 2022, France ¹⁸	Online survey	517	18–43	BC	78.9%	69.9% Tiers I/II 30.1% Tiers III/IV	4.4% used emergency contraception	Receiving information about gonadotoxicity at BC diagnosis Anti-HER2 treatment

Abbreviation: BC, breast cancer.

By investigating the reasons that lead patients to choose one contraceptive method over another, it was revealed that tiers I and II methods were more frequently chosen by patients who had received a dedicated contraception counseling¹⁷ and were preferred because of their greater effectiveness and ease of use.¹⁵ When hormonal contraception was used, short acting methods were preferred over long acting ones.^{18,25} Among them, one study found vaginal ring to be the preferred choice, and this was explained because it was perceived as effective but less invasive than a daily pill (fear of medicalization).²⁵ In contrast, tiers III and IV methods were frequently chosen because they are non-hormonal,¹⁵ even in a significant percentage of patients without contraindications to hormonal methods,²⁵ suggesting a fear of their use even in patients who have had non-hormonal cancers.

In both Mody's and Massarotti's cohorts a copper-IUD was recommended to breast cancer survivors during a dedicated gynecological consultation; despite this, the preferred method was barrier contraception (condom), demonstrating little preference for intrauterine devices also in this subpopulation.^{24,25}

Contraception Counseling

The available evidence suggests that contraceptive counseling increases the conscious use of contraceptives,^{14,17,18,20,22,26} especially tiers I and II types.²⁰ All major guidelines recommend contraception counseling,^{8,27,28} but without clear instruction regarding when and by who the counseling should be done.²¹ Massarotti et al showed how only 9% of cancer patients request contraception on their own initiative at the first consultation after cancer therapies, suggesting the topic should be introduced by doctors themselves and suggested to patients first.²⁵

The best time for counseling seems to be as soon as possible after cancer diagnosis, as patients prefer to get as much information as possible about their future fertility as early as possible.²⁴ To avoid overloading patients with information when they receive the diagnosis, the ideal figure to conduct this counseling appears to be the gynecologist of the oncofertility unit, if available.²⁵ Oncologists should also receive adequate training regarding contraception, as it often happens that they do not provide enough information to patients and do not refer them to a gynecologist.²⁹ Even after referral, patients wait for the advice of the oncologist before making a definitive choice: Mody et al, in their online survey, showed that patients with cancer would like to discuss the method with the oncologist, after having received the prescription, to have confirmation of its safety.²⁴

Discussion

Contraception counseling has been shown to increase the use of contraception, especially in the most effective types, thus reducing the need to use emergency contraception and the risk of unwanted pregnancies. A reproductive counseling is recommended by all the guidelines, but the timing and mode of providing such a counseling should be better defined, supporting the creations of dedicated pathways to incorporate in clinical practice.^{30,31} The Oncofertility unit, born to preserve fertility of cancer survivors, should also have a role in providing adequate awareness to make conscious choices on when to have children,¹ including contraception counseling when they cannot or do not want to have them yet. Oncologists should be aware of the availability of different methods for their patients, as they will search for their confirmation regarding their safety.²⁴

To increase compliance with time, it is important that education about contraception and cancer goes beyond highly specialized centers: general practitioners and gynecologists who work outside oncofertility units should also be trained to provide accurate information to their patients.

It has to be noted that contraception counseling cannot be the same for all patients, but it should be tailored to each patient, taking into account various factors such as her desire to have children and the type of cancer and the required therapies.

A focal point in contraception counseling is the presence of a hormone sensitive cancer, such as breast cancer, versus other neoplasms. Indeed, patients with non-hormone-sensitive tumors can be offered all types of contraception, as there is no contraindication to hormone therapy. Nevertheless, studies have found that the use of hormonal contraceptives is lower compared to non-hormonal methods due to the fear of taking hormones.^{15,25} This underlines the even greater importance of counseling this group of patients that should be adequately informed, so they know that hormonal contraception, in the absence of contraindications, is an effective and safe option.

The situation is different for patients with hormone-sensitive tumors such as breast cancer and certain types of endometrial cancer: hormone therapy is contraindicated for them due to the potential risk of disease recurrence. This should be very clear to physicians and patients, since Lambertini et al found that 5.8% of the breast cancer patients in their cohort used hormonal methods despite them being contraindicated due to their specific diagnosis.²⁶ However, this does not mean that these patients cannot use effective contraception: in addition to barrier methods (condoms), the copper intrauterine device should also be suggested.³² The final decision on which method to uptake (if any) will always be the patient's, but the physician's duty is to give the necessary information to make an informed decision.

It must be noted that the available literature on contraception in cancer patients and survivors is scarce and heterogeneous, limiting the strength of the conclusions.

First, the studies included display significant heterogeneity in terms of study design, population size, cancer types, and methods of data collection, which complicates direct comparisons and limits the ability to generalize results across different patient populations. Most of the studies relied on self-reported data for contraception use, which introduces the possibility of recall bias and social desirability bias, potentially leading to inaccuracies in reported contraceptive practices. Another limitation is the predominance of cross-sectional designs, which precludes conclusions about causality between factors such as counseling and contraceptive use. Geographic limitations also apply, as a majority of studies were conducted in the United States and Western Europe, potentially limiting the applicability of findings to populations in other regions where cultural attitudes and healthcare access differ significantly. These limitations underscore the need for further research with standardized methodologies, larger sample sizes, and longitudinal designs to better understand contraceptive use in diverse cancer patient populations.

Conclusions

A reproductive counseling is recommended by all the guidelines, but timing and mode of providing such a counseling should be better researched and defined, supporting the creations of dedicated pathways to incorporate into clinical practice. The ideal time to start talking about contraception is before the start of the oncological therapies, and it should be performed at the oncology care center, possibly by the gynecologists of the oncofertility unit. Educational initiatives directed towards oncologists, generalist gynecologists and family medicine doctors are needed to expand the knowledge about contraception methods and their safety in cancer survivors.

Data Sharing Statement

No datasets were generated or analysed in the current paper.

Acknowledgments

Pictures inside the graphical abstract are taken from the BioRender platform with a full subscription plan. Matteo Lambertini acknowledges the Italian Association for Cancer Research ("Associazione Italiana per la Ricerca sul Cancro", AIRC; MFAG 2020 ID 24698) for supporting his research in the field of breast cancer in young women and oncofertility. Claudia Massarotti acknowledges the support by the Department of Neurosciences, Rehabilitation, Ophthalmology, Genetics and Maternal and Child Health (DINOGLMI Department) of the University of Genova/Fondi Ricerca Ateneo (FRA) 2022.

Graphical abstract created in BioRender. Massarotti, C. (2024) <https://BioRender.com/m76b513>.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Disclosure

Matteo Lambertini reports advisory role for Roche, Lilly, Novartis, AstraZeneca, Pfizer, Seagen, Gilead, MSD, Exact Sciences, Pierre Fabre, Menarini; speaker honoraria from Roche, Lilly, Novartis, Pfizer, Sandoz, Libbs, Daiichi Sankyo, Takeda, Menarini, Ipsen, Knight, Gilead, AstraZeneca; travel Grants from Gilead, Daiichi Sankyo, Roche; research

funding (to the Institution) from Gilead all outside the submitted work. The other authors report no conflicts of interest related to this work.

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