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Relation between Intrauterine devices and endometrial cancer

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ABSTRACT

Background: Cervical cancer is a global public health issue that requires early management and has a causal relationship with the Human Papillomavirus (HPV). HPV types 16 and 18, which cause around 70% of precancerous lesions and cervical malignancies, are the two high-risk HPVs. According to research on intrauterine devices, they do not affect the prevalence of HPV infection, but rather its development to cervical cancer. Many research on intrauterine devices (IUDs) reveal that they cannot change the prevalence of HPV infection, but they can change the progression of cervical cancer. Objective: The goal of this study was to look at the relationship between recent IUD use (by type) and cervical intraepithelial neoplasia.

Conclusion: Intrauterine devices (IUDs) are among the most successful means of contraception available today, with failure rates comparable to other forms of sterilization. IUDs have various advantages, including efficacy, ease of use, reversibility, and patient satisfaction, especially when it comes to time commitment for long-term use and cost. In addition, the influence of contraception on the development of precancerous cervix lesions and cervical cancer may provide information useful to women in making contraceptive decisions.

Keywords : Intrauterine devices, Cervical cancers , endometrioid carcinoma, Endometrioid tumours

INTRODUCTION

IUDs are plastic contraceptive devices that are put into the uterine cavity. There are several different types of IUDs, but this manual will discuss the usage of two commonly used forms, the Lippes loop (the loop) and the copper T[1].

Although IUDs are one of the oldest and most extensively used forms of contraception worldwide, their possible long-term consequences on the uterus have received little attention. Since the early twentieth century, occasional attempts have been undertaken to develop an intrauterine device (IUD) that would prevent conception without causing major harm[1].

The IUD is thought to cause an intensive local inflammatory response, which leads to the recruitment of phagocytic cells and mast cells, as well as lysosomal activation and the release of proteolytic enzymes from these cells into the uterine cavity[2]. Furthermore, scanning

electron microscope studies of the endometrium in IUD-wearing women reveal changes in the surface morphology of cells, particularly the microvilli of ciliated cells, as well as a reduction in ciliated cells with impaired secretory activity in the epithelium next to the device. Other studies have found changes in the composition of proteins within the uterine cavity, as well as changes in endometrial responsiveness to estrogen and progesterone [3, 4].

An IUD is a tiny, generally plastic device that fits inside your uterus (or womb) and alters the environment so that conception is not possible. [4]

Inside your uterus, a progestogen IUD delivers a small amount of a synthetic female hormone. This type of IUD is commonly used as a contraceptive or to treat heavy periods (menstrual bleeding). Progestogen IUDs can also assist to thin the uterine lining (the endometrium), which is why they may be beneficial in treating endometrial cancer in some cases[4].

The epidemiological evidence on the association between IUD use and endometrial cancer is limited, and few studies have looked into the likelihood of such a correlation, so the goal of this study was to look at the relationship between recent IUD use (by type) and cervical intraepithelial neoplasia.

cancer of the endometrium:

Endometrial cancer is classified into two types: type I (also known as endometrioid carcinoma) and type II (table 1). Endometrioid carcinoma is the most prevalent type of endometrial cancer and the most common type of uterine malignancy in general. Endometrioid tumors are typically adenocarcinomas that develop in the endometrium's glandular cells. Endometrioid carcinomas are often well-to-moderately well-differentiated and low-grade. This form of endometrial cancer has a good prognosis and usually manifests up early with irregular uterine bleeding.[2]

Endometrioid carcinoma is related with oestrogenic stimulation that is unopposed and may be preceded by an intraepithelial tumor (atypical and/or complicated endometrial hyperplasia). This is assumed to be due to long-term unopposed oestrogen exposure, which causes endometrial hyperplasia, which raises the risk of developing atypical hyperplasia and, ultimately, type I endometrial cancer.[3]

Type II tumors, in contrast to type I tumors, are not oestrogen-driven and are mostly caused by endometrial atrophy caused by factors such as increasing age. It is uncommon to find a precursor lesion. Endometrial malignancies of type II are either weakly differentiated (grade 3) endometrioid lesions or non-endometrioid lesions such as serous carcinoma, clear cell carcinoma, and mucinous carcinoma.[3] These tumors are frequently high-grade, have a bad prognosis, and have a proclivity to deeply infiltrate and metastasize in the myometrium.Women who have type II endometrial cancer are at a high risk of developing relapse and metastatic illness are both possibilities.[5]

Table 1: shows the distinctions between type I and type II endometrial cancer. Passarello et al. (2019)10 adapted [5]

Characteristics	Type I	Type II
% of cases	80% to 90%	10% to 20%
Risk factors	Unopposed oestrogen	Age (postmenopausal women)
Precursor	Endometrial hyperplasia	Unknown, but often occurs in atrophic endometrium
Grade	Low	High
Histology	Endometrioid adenocarcinoma (grades 1 and 2)	Non–endometrioid (i.e. serous, clear cell) & poorly differentiated endometrioid (i.e. grade 3)
Molecular features	PTEN mutations; KRAS overexpression; microsatellite instability (MSI)	KRAS overexpression; HER2 overexpression; TP53 mutations
Metastasis	Uncommon, but often regional metastasis if this does occur	More common and can be regional and/or distant metastasis Prognosis Favourable Not favour
Prognosis	Favourable	Not favourable

IUD Mechanism and Role in Lower Cervical Cancer:

One of the most efficient kinds of contraception is the intrauterine device. Over the last two decades, the use of intrauterine devices has expanded in the United States. In the United States, two formulations are commercially available: the levonorgestrel-releasing intrauterine device and the copper intrauterine device. The levonorgestrel intrauterine device produces progestin, which causes endometrial suppression and thickening of cervical mucus, preventing sperm from accessing the fallopian tubes. IUDs may also act by blocking ovulation, but this is only partially effective [6].

The basic mechanism of action of the copper intrauterine device is to induce a local inflammatory response in order to prevent conception. While the benefits of combination hormonal contraception against ovarian and endometrial cancer, as well as tubal sterilization against ovarian cancer, are widely acknowledged, little is known regarding the impact of current intrauterine devices on the development of gynecologic malignancies. Although studies imply that both copper intrauterine devices and levonorgestrel intrauterine devices reduce endometrial cancer risk, the best evidence for a protective impact of intrauterine device use against cancer incidence pertains to levonorgestrel intrauterine devices and endometrial cancer. The postulated multiple modes of action, which include both endometrial suppression and a local inflammatory response, support this. Investigations examine the link between intrauterine device use .[6]

Although the use of intrauterine devices reduces the risk of cervical intraepithelial neoplasms, the effect of levonorgestrel intrauterine device use on cervical cancer is unknown. Older studies connected its usage to an increased risk of cervical dysplasia, while more current

research has demonstrated a reduction in cervical cancer risk with intrauterine device use. Several protective mechanisms have been proposed, including a device-related inflammatory response in the endocervical canal and prostaglandin-mediated immunosurveillance. Overall According to the existing evidence, both levonorgestrel intrauterine devices and copper intrauterine devices minimize the incidence of gynecologic cancer. While there is evidence to support the use of hormonal and copper intrauterine devices to reduce endometrial cancer risk, and copper intrauterine device used to reduce cervical cancer risk, evidence to support the use of levonorgestrel intrauterine device used to reduce cervical and ovarian cancer risk is less consistent.[7]

Conclusions

(IUD) is associated with a lower incidence of cervical cancer. The study was unable to demonstrate that the use of IUDs caused the drop, but the connection was strong. Women who utilized IUDs had one-third (about 33%) fewer cervical cancer than women who did not. Importantly, the study's authors caution that women should not interpret these findings to indicate that they should rely on IUDs as protection against HPV infection. IUDs are one of the most successful methods of birth control, and this may be a factor to consider when selecting a birth control technique.

Conflict of interest: none

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