

# The Effect of Intrauterine Contraceptive Device and Oral Contraceptive Pills Use on Pap Smear Results

1- Hadeer Jabbar Dakhal<sup>1</sup>

3- Esam Shyaa khudhair<sup>2</sup>

5- Salam Sahib Abaid<sup>4</sup>

2-Haider Jebur Kehiosh<sup>2</sup>

4- Wasan G. Alsafi<sup>3</sup>

6- Ali A. Abutiheen<sup>3</sup>

E-mail: [aliabutiheen@uokerbala.edu.iq](mailto:aliabutiheen@uokerbala.edu.iq) , [aliabutiheen@yahoo.com](mailto:aliabutiheen@yahoo.com)

## Abstract

### Background:

Intrauterine contraceptive device (IUCD) oral contraceptive pills (OCP) are widely used contraceptive methods by women. Some concerns had been raised about the role of IUCD and OCP in the development of cervical dysplasia and cancer. And cervical cancer is the fourth most frequent cancer in women, with over half million new cases reported each year.

### Objectives:

To evaluate the effect of IUCD and OCP use on pap-smear results among women in Karbala city. And to assess some factors associated with cervical dysplastic changes.

### Subjects and methods:

A case-control study. Three groups of women were categorized according to the use of OCP, IUCD, or other contraceptive methods for one year accordingly. Pap smears were taken for them and reports were reviewed by a consultant cytopathologist. A total of 237 cases were collected.

### Results:

The three groups had no significant difference in age, parity, or duration of contraceptive method used. Most Pap smear results were normal, 29 (12.2%) had inflammation and only 7 (3%) showed dysplastic changes and no malignancy change identified among the sample.

Inflammatory changes were more prevalent among IUCD users while benign dysplastic changes were more prevalent among women who used other methods of contraception. Dysplastic changes were significantly associated with older age of above 35 years.

### Conclusion:

No association between OCP and IUCD use with abnormal pap-smear results as a significant risk factor for cervical cancer. Inflammatory changes were more prevalent among women who use IUCDs. Dysplastic changes are associated with age over 35 years.

**Keywords:** Intrauterine contraceptive device (IUCD), Oral contraceptive pill (OCP), Pap smear, Contraception, Cervical carcinoma, Dysplastic changes.

1 Al-Hur primary health care Sector- Karbala Health Directorate\ Karbala\ Iraq

2 Al-Hussein Teaching Hospital -Karbala Health Directorate\ Karbala\ Iraq

3 College of Medicine – University of Kerbala\ Karbala\ Iraq

4 Public Health department- Karbala Health Directorate\ Karbala\ Iraq

Corresponding author: Ali A. Abutiheen

Family & Community Medicine department\ College of Medicine – University of Kerbala\  
Karbala\ Iraq

## Introduction

Client-centered contraceptive counseling is an essential approach that achieves the need for contraception with caring for women's rights and dignity. However, despite various efforts to optimize counseling, little is known about what individuals themselves value. Various forms of contraception are available, However, each person should select a suitable form for use. As some might not be fit for her situation. The choice of the appropriate type of birth control depends on the general health of the person, age, sexual activity, the number of partners, the future intention to have children, and the family history of certain diseases (1, 2).

Intrauterine contraceptive device (IUCD) is an effective and widely popular mode of contraception. IUCD insertion is an outpatient procedure that should be performed by trained healthcare providers (3-5). The increase in popularity may be attributed to its efficacy, handy reversibility, client satisfaction, and its long-term use. IUCD use reduces endometrial cancer risk, but little is known about its association with cervical cancer risk (6,7)

Oral contraceptives (OCPs) were commonly used by women for decades. Although women have access to different contraceptive methods (condom, skin patch, diaphragm, vaginal ring, injections, spermicidal substance, and others), OCPs still the most common reversible contraceptive method used. OCPs if properly used will generate secure and reliable birth control. Progestin-only pills (POPs) and combined oral contraceptive

pills (COCs) are the two well-known classes of OCPs (8,9). COCs as a contraceptive tool might be preferred for their non-contraceptive advantages, as COCs can decrease the symptoms of endometriosis, polycystic ovary syndrome, dysmenorrhea, premenstrual syndrome. As well as the risk reduction for ovarian and endometrial cancers, improvement in acne, and a positive impact control of the menstrual cycle. Alternatively, COCs can cause several side-effects, including deep venous thrombosis (DVT), change in mood, and might also raise the risk of breast tumors. However, known side effects are self-limiting and diminish with prolonged use, while major adverse reactions, as DVT, are unusual among healthy women (10,11). Further, some evidence suggests that long-term use of combined oral contraceptives is associated with a small increased risk of cervical cancer (12).

Cervical cancer is the fourth most frequent cancer in women with over half a million new cases that constitute 6.6% of all female cancers reported in 2018. Further, about 90% of cervical cancer deaths take place in low and middle-income countries. Cervical cancer is developed by a sequence of epithelium modification called cervical intraepithelial neoplasia (CIN). The biological and genetic features of in situ cancer cells are irreversibly modified and malignant cells can disseminate to other body organs (13,14).

However, the optimistic issue is that more than 90% of cervical cancers are

preventable. Inclusive control strategies for cervical cancer include vaccination against human papillomavirus (HPV) as primary prevention, screening and treatment of pre-cancer lesions as secondary prevention, and tertiary prevention through the diagnosis and treatment of extensive cancer cases and palliative care (13,15). HPV vaccination helps prevent infection with the HPV types that cause most cervical cancers. The center of disease control and prevention (CDC) recommends that 11 to 12-years old females take two doses of HPV vaccine to protect against HPV induced cancers, with 6–12 months apart between the first and second doses. To reduce mortality from cervical cancer, early diagnosis and treatment of women are essential approach. For this reason, the mortality due to cervix cancer has fallen dramatically in developed countries since the advent and widespread application of screening with the Pap smear test (13,16,17).

The preferable approach to diagnose cervical cancer in the early stage is to have routine Pap smear screening, which might be in conjunction with a test against specific strains of the HPV, which causes most cases of cervical cancer. Employing Papanicolaou staining of cervical swab or cytobrush specimens containing exfoliated cervical cells (the Pap smear). This cytological staining process enables microscopic detection of cellular changes characteristic of HPV infection (koilocytosis, dyskariosis) and is associated with various stages of the development of dysplasia and, CINs (18,19).

The objective of this study is to identify the effect of OCP and IUCD use morphological findings of Pap smear results and factors associated with it.

### **Subjects and methods:**

A cross-sectional study. The women participants involved in this study were selected by systematic random approach from those who attended to Karbala obstetrics and gynecology (OBG) hospital and family planning services in the three primary health-care centers (PHCCs) of Al-Hur district at Karbala city in Iraq. The study was conducted over seven months from 1st of November 2014 to 15th of September 2015.

Women aged 15–49 years with a history of contraceptive methods use either IUCD or OCP for at least one year were eligible for the study. Women with a history of sexually transmitted disease, being smokers, had undergone a previous pap-smear screen, diagnosed with any other malignancy, had done hysterectomies or using other hormonal methods were excluded from the study.

Women subjects were divided into three groups according to the method of contraceptive use. Group 1 consisted of current or past OCP users, Group 2 consisted of women with IUCD usage, while the women who used other methods of contraceptive were considered in the control group.

Ethical approval was obtained from the research ethics committee at Karbala Health Directorate, and from the department of Family Medicine at the Arab of health specialization- Baghdad office. Further, the patients were informed about the aim of the study and verbal consent on participation was obtained from them with assuring the confidentiality of the patient's information.

Patients were directly interviewed using a specially designed questionnaire form that was prepared for the study and been tested in a pilot study. The questionnaire includes

some socio-demographic information, questions related to the general health condition, obstetric history, menstrual history, contraceptive use, previous PAP smear, and any related medical conditions including malignancy. Further, 23 women with inadequate smear or non-conclusive histological evaluation were excluded from the study.

Patients then were requested to take a pap smear test after taking a consent preceded by an explanation of the procedure and the objectives. A pap smear procedure was done by trained physicians at the time of pelvic examination. The patient was informed about the start of the procedure, a bivalve plastic speculum was inserted in the vagina and then placing the tip of the cervical brush into the outer cervical os and rotate three

times by 360 degrees to ensure that it is in contact with the cervix. Remove the brush to make sure it does not wipe against anything. Tap the brush several times on the edge of the pot of cytology medium. All Pap smear reports were reviewed by a histopathology specialist at Cytopathology Department of Al-Hussein Teaching Hospital.

Data were entered and analyzed using statistical package for social sciences (SPSS) program version 18. Qualitative data were expressed as frequency (N) and percentages (%), while quantitative data were expressed as mean and standard deviation (SD). Chi-square, fissure exact test, t-test, and ANOVA test were used accordingly for data analysis. A p value of < 0.05 was considered statistically significant

### Results

A total sample of 237 women with adequate histological results was achieved. Who were distributed according to the 3 groups, 74 (31.2%) in Group 1 f the client who gave the history of OCP use. 74 (31.2%) in Group 2 clients with IUCD use. And 89 (37.6%) in Group 3 (control) client who used other methods of contraceptive as shown in figure 1.

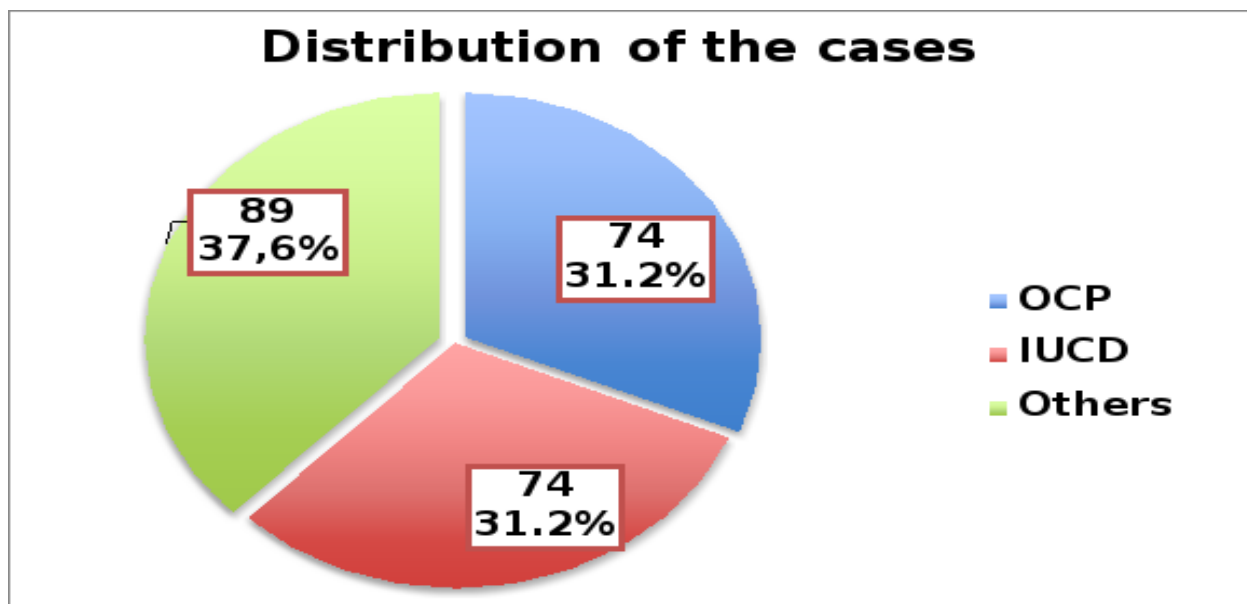


Figure 1. Distribution of the study population according to the contraceptive method used

The age of clients ranged between 17 and 47 years with a mean age  $\pm$  SD in years of  $32.54 \pm 7.67$  years. Where 95 (40.1%) of the clients were in the age group 25 - 34 years, 108 (45.6) % of the clients had 3-4 children. While 118 (61.6%) secondary school education category as shown in table 1.

Table 1: The age, parity, and educational level of the total clients.

Variable		N	(%)
Age\years	< 25	50	21.1%
	25-34	95	40.1%
	35-44	82	34.6%
	$\geq 45$	10	4.2%
	Total	237	100%
Parity	< 3	60	25.3%
	3-4	108	45.6%
	> 4	69	29.1%
	Total	237	100%
Education level	Illiterate\ Primary	111	46.8%
	Secondary	118	49.8%
	Higher Education	8	3.4%
	Total	237	100%

The mean age  $\pm$  SD of the OCP, IUCD, and other groups are shown in table 2. And there was no significant difference between the means of age of the three groups, p value  $> 0.05$  as shown in table 2. Further, there was no statistically significant difference between the means of the parity and duration of contraceptive method used between the groups.

Table 2: The association between the clients' age, parity and duration of contraceptive usage with the type of contraceptive method used.

	Total	OCP	IUCD	Others	P value
Age in years Mean $\pm$ SD	$32.54 \pm 7.67$	$32.4 \pm 8.31$	$31.23 \pm 6.73$	$33.73 \pm 7.98$	$> 0.05$
Parity Mean $\pm$ SD	$3.63 \pm 1.74$	$3.49 \pm 1.58$	$3.42 \pm 1.41$	$3.95 \pm 2.11$	$> 0.05$
The duration of contraception use in years Mean $\pm$ SD		$3.42 \pm 1.57$	$3.58 \pm 1.46$		$> 0.05$

The grossest findings by visual inspection during pelvic examination were cervical erosion, which was noticed among 74 (31.2%) of the sample as shown in figure 2.

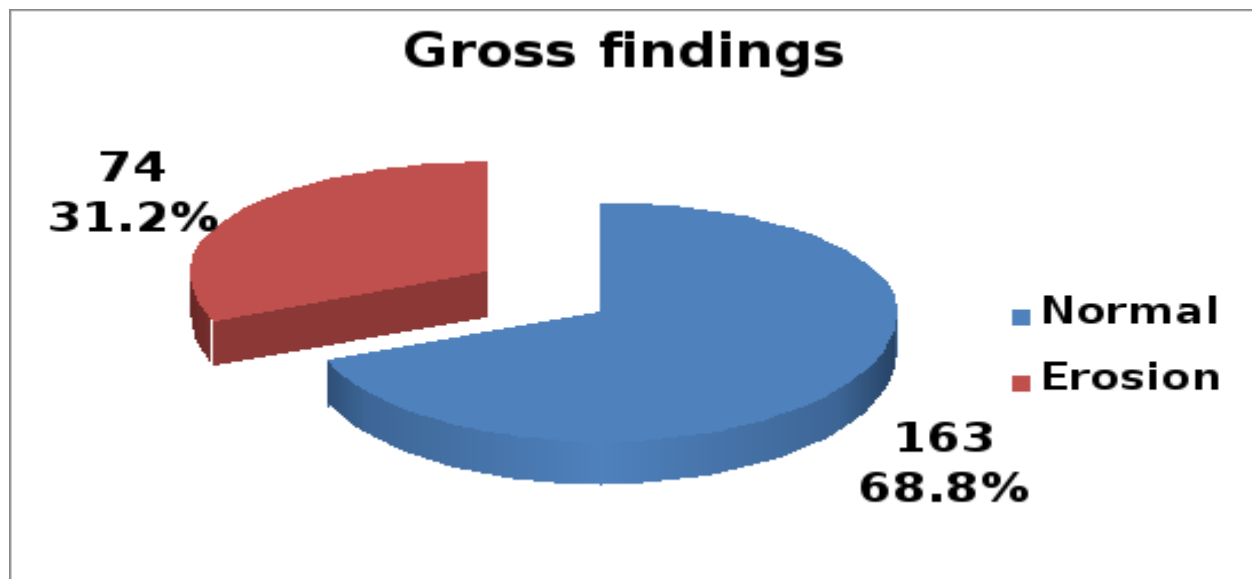


Figure 2. Prevalence of cervical erosion among the total sample by visual inspection. From total 237 smears with an adequate histological evaluation that were included, 201(84.8%) showed normal smears, 29 smears (12.2%) had inflammatory changes and 7(3%) showed cervical dysplasia (ASC-US). While no epithelium of malignancy changes was reported in Pap smears of the 3 groups, as shown in Figure 3.

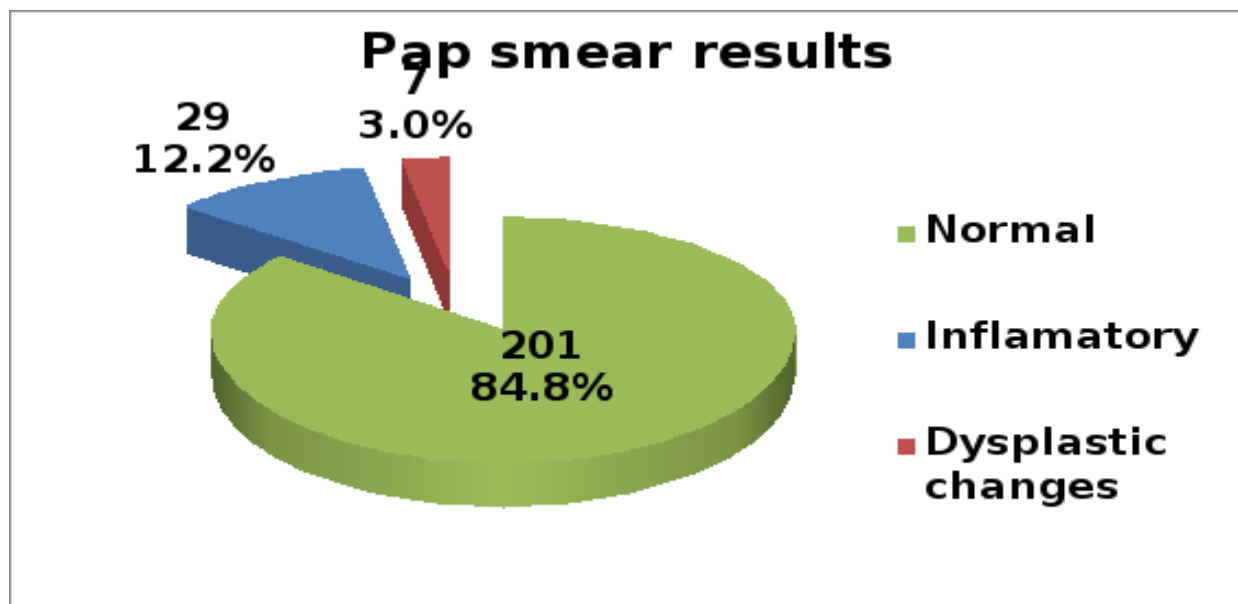


Figure 3. The Pap-smear results for the total sample. The pap-smear results vary between the 3 groups with statistical significance. Where the inflammatory changes show a higher percentage among the IUCD group, while the cervical dysplastic changes were higher among the other group as shown in Table 3.

Table 3: The association between the types of contraceptive with cervical abnormality

		The type of contraceptive method used			P value
		OCP	IUCD	Others	
Normal	N	67	57	77	0.003
	(%)	90.5%	77%	86.4%	
Inflammatory	N	7	16	6	
	(%)	9.5%	21.6%	6.7%	
Dysplastic changes	N	0	1	6	
	(%)	0%	1.4%	6.7%	
Total	N	74	74	89	
	(%)	31.2%	31.2%	37.6%	

The cervical dysplasia (ASC-US) was significantly associated with older age of  $\geq 35$  years of client. Also, cervical dysplastic abnormality was higher among women with high parity  $> 4$  but with no statistical significance, as shown in table 4.

Table 4: The association between the age and parity of client with cervical dysplasia.

		Dysplastic change		P value
		Yes N (%)	No N (%)	
Age group in years	$< 35$ years	0 (0%)	145 (100%)	0.001
	$\geq 35$ years	7 (7.6%)	85 (92.4%)	
Parity	$\leq 4$	3 (1.7%)	165 (98.2%)	0.198
	$> 4$	4 (5.8%)	65 (94.2%)	

## Discussion

Cervical cancer is one of the leading cancers among women. Periodic pap screening is the simplest way to diagnose precancerous lesions (20). Being an Islamic and oriental country, Iraq due to religious rules, cultural traditions, and the ban on sex work. Women with multiple partners are limited or rare. So all women in this study maintain a single partner who is their husband. These facts by themselves decrease the possibility of HPV infection, other sexually transmitted infections and as a result the cervical cancer prevalence. Another related fact is the low rate of smoking among Iraqi women (21).

There was no significant difference between the three groups in relation to age, parity, and duration of contraceptive usage and this increase the homogeneity of the groups and validity of results.

During the pelvic examination by speculum, about one-third of clients have cervical erosion, while others appear normal. This finding is consistent with other previous studies done in China and Nigeria (22,23).

The Pap smear results of all three groups showed that more than 12.2% of the sample

had inflammatory changes. While only 7 smears (3%) showed Pap smear abnormalities such as cervical dysplasia as ASC-US. However, vaginal samples for Trichomonas vaginitis and other sexually transmitted diseases were not obtained as part of this study. A report of inflammatory changes on Pap smear cannot be used to reliably predict the presence of genital tract infection especially in asymptomatic women, but these clients will need a follow-up pap smear if inflammatory persist to be excluded. Cervical inflammation was present in 12.2%, and the largest proportion was observed in women using IUCD, with a statistical significance between groups. These findings are similar to a study conducted in Egypt (24) but, differ from a study in Nigeria which showed no association between cervical inflammatory changes in Pap smear and IUCD using (25).

Regarding the cervical dysplasia and malignancy cell smear in all groups shows that one in the IUCD group and 6 in the others group had dysplastic cell changes in their pap-smear as (ASC-US), with no malignancy changes in all 3 groups. So probably, we can conclude that the IUCD and OCP did not affect the morphological pattern of the Pap smears. While, previous studies have suggested that people having an IUCD are at increased risk for cervical cancer, more recently found that IUCD use may play a further role in the path of cervical cancer by suppressing the growth of precancerous lesions of the cervix or improving the removal of generated precancerous lesions. Besides, IUCD using women had nearly half the risk of cervical cancer than those who never used IUCD (26,27).

Further, the link between oral contraceptives and cancer cannot definitively establish that

OCPs cause cervical cancer. Some studies concluded an association whatever a weak positive between combined oral contraceptives (COCs) use and the risk of cervical dysplasia (28,29). Other researchers show that COCs have long been considered to be associated with a small increased risk of cervical cancer. This association may be attributed to bias and confounding, like smoking sexual behavior socioeconomic and human papillomavirus. on the other hand, some study suggests that the longer a woman uses oral contraceptives, the greater the increase in her risk of cervical cancer (30,31). A significant association between dysplastic changes and age over 35 years was identified. This is consistent with was documented that older age had a significant effect on cervical dysplasia (32).

Cervical dysplasia appeared to occur somewhat more after the fourth delivery births as shown, but it was not statistically significant. Another study also concluded that no consistent association emerged between cervical dysplasia or cancer and parity (33). While a relation of cervical cancer and multiparity was observed in some other studies that consider that high parity had a significant association with cervical cancer (32,34,35). This may be related to the pregnancy induced cervical changes that predispose to malignant transformation.

## Conclusion

No association between OCP and IUCD use with abnormal pap-smear results as a significant risk factor for cervical cancer. Inflammatory changes were more prevalent among women who use IUCDs. Dysplastic changes are associated with older age.



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## تأثير استخدام اللولب الرحمي وحبوب منع الحمل على نتائج مسحة عنق الرحم

- 1- د. هدير جبار دخل<sup>1</sup>
  - 2- د. حيدر جبر كحيوش<sup>2</sup>
  - 3- د. عصام شياع خضير<sup>2</sup>
  - 4- د. م. د. وسن غازي الصافي<sup>3</sup>
  - 5- د. سلام صاحب عبيد<sup>4</sup>
  - 6- د. م. د. علي عبد الرضا ابو طحين<sup>3</sup>
- 1 قطاع الحر للرعاية الصحية الاولية- دائرة صحة كربلاء المقدسة
  - 2 مدينة الامام الحسين (ع) الطبية- دائرة صحة كربلاء
  - 3 كلية الطب – جامعة كربلاء
  - 4 قسم الصحة العامة – دائرة صحة كربلاء المقدسة

### الخلفية:

اللولب الرحمي وحبوب منع الحمل من أكثر وسائل منع الحمل استعمالا بين النساء. ولأجل ذلك أثرت مخاوف عدة حول دور كلا منهما في تكوين الخلل النسيجي المرضي وسرطان عنق الرحم. وسرطان عنق الرحم يأتي بالمرتبة الرابعة من بين السرطانات الأكثر انتشارا بين النساء. حيث يتم تسجيل أكثر من نصف مليون حالة جديدة في كل عام.

### الهدف:

لتحديد أثر استخدام اللولب الرحمي وحبوب منع الحمل على نتيجة مسحة عنق الرحم بين النساء اللواتي يعشن في مدينة كربلاء و تقييم العوامل المرتبطة بالتغيرات النسيجية الرحمية.

### طرق البحث:

دراسة عرضية مقطعية. تم تقسيم النساء المشاركات بالدراسة إلى 3 مجاميع بحسب وسائل منع الحمل المستخدمة من قبلهن (حبوب منع الحمل، اللولب الرحمي، انواع اخرى غير هرمونية). تم إجراء مسحة عنق الرحم لجميع النساء المشاركات بالدراسة والبالغ عددهن ٢٣٧ مشاركة، وتم تقييم نتائج المسحات من طبيب مختص بالنسيج المرضي

### النتائج:

لم يكن هنالك فرق احصائي مميز بين المجموعات الثلاث بما يخص العمر أو عدد الولادات أو مدة وسيلة منع الحمل المستخدمة. كانت معظم نتائج مسحة عنق الرحم طبيعية، فيما كان لدى 29 (12.2%) تغيرات التهابية و فقط 7 (3%) أظهرن تغيرات الخلل النسيجي ولم يتم تحديد أي تغيرات نسيجية خبيثة لدى العينة. كانت التغيرات الالتهابية أكثر انتشاراً بين من استخدمن اللولب الرحمي، بينما كانت تغيرات خلل التنسج أكثر انتشاراً بين النساء اللاتي يستخدمن طرقاً أخرى لمنع الحمل. وارتبطت تغيرات الخلل النسيجي بشكل مميز مع تقدم العمر فوق 35 عامًا.

### الاستنتاج

لم تظهر الدراسة اي ارتباط بين استخدام اللولب الرحمي او حبوب منع الحمل ونتائج مسحة عنق الرحم. وبالتالي لا يعتبران عوامل خطر للإصابة بسرطان عنق الرحم. كما أن التغيرات الالتهابية كانت أكثر شيوعاً عند النساء اللاتي يستخدمن اللولب الرحمي، بالإضافة الى ذلك فان تغيرات الخلل النسيجي في عنق الرحم تكون أكثر حدوثاً بعد عمر ال ٣٥ سنة.