Journal of Obstetrics, Gynecology and Cancer Research | ISSN: 2476-5848

The Frequency of Clinical and Demographic Characteristics in Patients Exhibiting Abnormal Pap Smear Results

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Article Info

10.30699/jogcr.10.6.475

Received: 2024/08/11;
Accepted: 2024/09/18;
Published Online: 05 May 2025;

Use your device to scan and read the article online

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ABSTRACT

Background & Objective: As the second most frequent disease in women, cervical cancer is regarded as a major worldwide health concern. The present study was conducted with aim to identify the demographic characteristics of female patients who had abnormal pap smears results.

Materials & Methods: This cross-sectional descriptive study was carried out on 400 women with abnormal pap smears results who were sent to the Alavi Hospital's oncology clinic between 2021 and 2023. A questionnaire was used to collect data, which were then analyzed using statistical SPSS software (version 21). P<0.05 was considered statistically significant.

Results: The mean age of the patients was 38.9 years. The abnormal Pap smear results were linked to ageing, smoking, having sex or marriage before turning 18, HPV infection, family history of cancer, using an intrauterine device (IUD), and menopause. Consumption of the oral contraceptive pill (OCP) was found to be protective against the lack of LSIL and HSIL in higher Pap smear classification classes, with consumption being lower in these grades than in lower grades. There was no discernible correlation found between the abnormal Pap smear results and the patients' area of residence, history of pregnancy, education, or diagnosis of Polycystic Ovary Syndrome (PCOS).

Conclusion: The current study's findings can be useful in gaining a general understanding of the pattern, prevalence, and demographic characteristics of abnormal findings in women with abnormal pap smears.

Keywords: Cervical Cancer, Abnormal Pap smear, Oncology, Screening

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1. Introduction

Cervical cancer as the second most frequent disease among women is regarded as a major worldwide health concern **(1, 2)**. The most prevalent histological subtypes of this malignancy are adenocarcinomas and squamous cell carcinoma, contributing about 25% and 70% of all cervical malignancies **(3)**. In only 2018, there were over 560,000 new cases of cervical cancer detected globally, and the illness claimed over 310,000 lives **(4)**. The incidence and fatality rates associated with cervical cancer exhibit significant regional variations over a 30-year period, its incidence and mortality rates decreased by half in developed countries **(5)**. According to the national report of the registration of cancer cases, the incidence of cervical cancer among Iranian women in different provinces has been reported to be 1.7 per 100,000 women **(1)**.

Cervical cancer is a disease with preneoplastic changes with a long natural trend, and this feature of the disease potentially provides the possibility of early diagnosis of the disease in the early stages **(4)**. In this regard, the main purpose of performing a Pap smear is to identify precancerous lesions in order to prevent progression to invasive cancer **(6)**. Pap smear is considered the best morphological screening test for cervical cancer, which reveals precancerous lesions and early stages of cervical cancer through cytology **(7)**. Most of guidelines recommended that women perform the first Pap smear test after starting sexual activity and repeat it every 1 to 5 years thereafter **(6-9)**. In affluent nations, cytology-based screening programs have significantly decreased the number of women who die from cervical cancer **(3)**. Although the incidence of cervical cancer in Iran is lower than

worldwide, most cases are discovered when the disease is already advanced, which unfortunately leads to a high death rate. In addition, the findings of more recent research indicate that in Iran, the prevalence of abnormal Pap smears has increased 2-4 times in the past few years compared to the previous year **(10)**. Furthermore, compared to industrialized nations, there is comparatively less data regarding the prevalence of abnormal results and the epidemiological traits of women in the nation who have abnormal Pap smears results **(10)**, a difference that is particularly apparent in our area. Thus, considering this informational gap, the present study was conducted with aim to examine the types of abnormal and demographic findings in women with abnormal Pap smears results who referred to the Oncology and Women's Clinic of Ardabil during the 2021-2023.

2. Materials and Methods

This cross-sectional descriptive research was conducted on 400 women with abnormal Pap smear results who were referred to the Alavi Hospital's oncology clinic between 2021 and 2023. The patients having a history of gynecological surgery and manipulation, which includes any surgeries involving cervical manipulation, such as hysterectomy and conization were excluded from the study. The type of abnormality found in the pap smear test, age, education level, employment status, economic status, body mass index, place of residence, history of smoking, history of sexual activity and marriage before the age of 18, history of PCOS, history of papillomavirus infection, history of cancer in the first degree family, history of intrauterine device, number of marriages, number of pregnancies, number of births, history of vaginal and cesarean delivery, history of using contraceptives, duration of use of contraceptive hormones and menopause status were collected. Abnormal Pap smear findings were reported according to the Bethesda classification system, which is a framework for reporting cytopathology of cervicovaginal specimens. In this system, epithelial cell abnormalities in two main squamous categories including atypical squamous cells of undetermined significance (ASCUS), low-grade squamous intraepithelial lesion (LSIL) and high-grade squamous intraepithelial lesion (high-grade squamous intraepithelial lesion = HSIL) and atypical granular cells of undetermined significance (AGCUS) include atypical NOS (not otherwise specified), atypical, favor neoplastic, endocervical adenocarcinoma in situ (endocervical adenocarcinoma in situ = AIS) and adenocarcinomas **(25)**.

The data were analyzed using SPSS (version 25). Tables and graphs were used to display the results. ANOVA test was utilized to assess the link between quantitative variables and abnormal results in Pap smears, while chi-square test was employed to assess the relationship between the two types of data. $P<0.05$ was considered significant.

3. Results

The mean age of patients was 38.9±10.2 years. The mean BMI of the studied women was 26.5±4.9 kg/m^2. Also, 69.3% of the participants lived in the city. Moreover, 20.8% of the participants had sexual intercourse and marriage under the age of 18. In addition, 15.8% of the participants had PCOS, 11.8% had HPV infection, 9% had a family history of cancer, 9% smoked and 12.8% used IUD. In this study, OCP consumption was present in 34% of women. Also, 16.5% of the women were menopause. Among women with abnormal Pap smear findings, 48.8% had ASCUS, 19.8% had ASC-H, 23.8% had LSIL, 5.5% had HSIL and 2.3% had AGCUS. The mean age in women with AGCUS abnormal Pap smear group was more than other Pap smear abnormal groups. The mean age and BMI were significantly different between abnormal Pap smear results, but the mean of Gravidity, Parity (NVD) and Parity (CS) was not significant. Also, a significant relationship was observed between smoking and sexual intercourse and marriage under 18 years with abnormal Pap smear findings. The frequency of ASCUS in women with smoking use and those who had sexual intercourse and marriage under the age of 18 were 7.7% and 19%, respectively (Table 1).

The rate of ASCUS in women with positive history of HPV and cancer were 9.2% and 6.2%, respectively. A significant relationship was observed between history of HPV infection, family history of cancer and use of IUD with abnormal Pap smear findings (Table 2).

The frequency of ASCUS in women with OCP intake and menopause women were 41% and 13.3%, respectively. Also, there was a significant relationship between OCP intake and menopause with abnormal Pap smear findings (Table 3).

Table 1. The abnormal Pap smear results by variables

Pap smear abnormal results Variables		ASCUS	ASCH	LSIL	HSIL	AGCUS	P value
Age		37.2±10.6	36.7±9.9	42.8±8.6	42.8±6.6	44.6±10.1	0.001
BMI		26.3±4.8	26.2±5.0	26.0±4.5	29.5±5.4	29.6±6.0	0.009
Gravidity		2.4±1.0	2.4±1.0	2.5±1.0	2.5±0.8	2.5±1.0	0.99
Parity (NVD)		0.8±0.6	0.8±0.6	0.8±0.6	0.8±0.6	1.0±0.5	0.96
Parity (CS)		1.2±0.7	1.2±0.7	1.2±0.7	1.2±0.6	1.2±0.7	0.99
Smoking	Yes	15(7.7%)	4(5.1%)	7(7.4%)	6(27.3%)	4(44.4%)	0.001
	No	180(92.3%)	75(94.9%)	88(92.6%)	16(72.7%)	5(55.6%)	
Sexual intercourse and marriage under the age of 18	Yes	37(19%)	17(21.5%)	16(16.8%)	9(40.9%)	4(44.1%)	0.04
	No	158(81%)	62(78.5%)	79(83.2%)	13(59.1%)	5(55.6%)	
History of PCOS	Yes	31(15.9%)	12(15.2%)	15(15.8%)	3(13.6%)	2(22.2%)	0.98
	No	164(84.1%)	67(84.8%)	80(84.2%)	19(86.4%)	7(77.8%)	

Table 2. The relationship between Pap smear abnormal findings with some variables

Variables		ASCUS	ASCH	LSIL	HSIL	AGCUS	P value
HPV infection	Yes	18(9.2%)	8(10.1%)	12(12.6%)	6(27.3%)	3(33.3%)	0.03
	No	177(90.8%)	81(89.9%)	83(87.4%)	16(72.7%)	6(66.7%)	
Family history of cancer	Yes	12(6.2%)	6(7.6%)	10(10.5%)	5(22.7%)	3(33.3%)	0.007
	No	183(93.8%)	73(92.4%)	85(89.5%)	17(77.3%)	6(66.7%)	
IUD use	Yes	15(7.7%)	8(10.1%)	19(20%)	6(27.3%)	3(33.3%)	0.002
	No	180(92.3%)	71(89.9%)	76(80%)	16(72.7%)	6(66.7%)	

Table 3. Relationship between Pop smear abnormal findings by variables

Variables		ASCUS	ASCH	LSIL	HSIL	AGCUS	P value
OCP intake	Yes	80(41%)	29(36.7%)	21(22.1%)	5(22.7%)	1(11.1%)	0.008
	No	115(59%)	50(63.3%)	74(77.9%)	17(77.3%)	8(88.9%)	
Menopause	Yes	26(13.3%)	10(12.7%)	24(25.3%)	7(31.8%)	3(33.3%)	0.01
	No	169(86.7%)	69(87.3%)	71(74.7%)	15(68.2%)	6(66.7%)	

4. Discussion

Cervical cancer is thought to be avoidable because premalignant phases of the disease can be identified by exfoliative cytology, such as a Pap screening test. In developed nations today, cytology is considered a screening test for cervical cancer in addition to HPV testing. As with other DNA viruses (including adenovirus, hepatitis B virus, etc.), polymerase chain reaction (PCR), hybridization (HC), and deoxyribonucleic acid (DNA) testing are used to identify HPV. Nonetheless, the Pap smear test is helpful as a screening tool in underdeveloped nations, with the ultimate goal of lowering mortality of cervical cancer through early identification of premalignant lesions **(11)**.

The results of this study showed that abnormal Pap smear results were related to age, smoking, marriage or sexual activity before the age of 18, HPV infection, family history of cancer, IUD use, and menopause. Higher Pap smear categorization classes consumed less OCP than lower grades, and this consumption had a protective impact on the occurrence of LSIL and HSIL.

There was no discernible correlation between the patients' place of residence, history of pregnancy, PCOS, and educational attainment and abnormal Pap smear results. Moreover, 48.8% of patients with abnormal Pap smear had ASCUS, 19.8% ASC-H, 23.8% LSIL, 5.5% HSIL and 2.3% had AGUS. In 2015 Maleki et al **(12)** in a study of 4274 married women aged 20 to 65 years reported the prevalence of cervical cytological abnormalities in Pap smear of 81 out of 173 women with ASCUS **(12)**. Jafari Shobeiri et al **(13)** study on 6024 women who underwent Pap smear indicated the presence of 62 cases (1.02%) of precancerous lesions, of which 41 (0.68%) were atypical squamous cells of undetermined significance (ASC-US) **(13)**. In the study of Karabulut et al **(14)** out of 107 smears (0.54%), the most included was ASCUS with 0.31% **(14)**.

Pap smear screening has been found to be significantly linked to a decrease in the incidence of invasive cervical cancer worldwide. Currently, liquid-based cytology and traditional cytology are the two Pap test methods employed. The routine Pap test serves as the main screening method in low-resource settings, even though liquid-based testing is widespread in developed nations. Numerous studies indicate that emerging nations account for the bulk of cervical cancer mortality. Thus, in a developing nation like Iran, it is critical to understand the typical course of epithelial cell abnormalities in Pap smears. Additionally, it is imperative to understand the pattern of pre-malignant and malignant lesions to provide counseling to women with set up a public health system **(15, 16)**.

Iran is one of the Islamic nations having a low incidence of cervical cancer but with high death rate due to non-comprehensive screening programs, and diagnosis of CC at an advanced stage **(17)**. Preinvasive cervical cancer has a lengthy latency period, but in modern nations, it is treatable because of early detection and treatment of precancerous lesions **(18)**. Therefore, Western nations had a notable decline in the incidence and mortality of cervical cancer during the past 50 years. Cervical cancer ranks as the sixth most common solid tumor in the US. But in developing countries, this cancer ranks second most common cancer in women and the leading cause of cancer-related deaths **(19)**. The risk of cervical cancer can be reduced by 45% with one negative Pap smear test and 99% with 9 negative tests. Failure to perform regular screening increases the risk of contracting this disease by 2 to 6 times **(20)**.

Pakniat et al **(21)** in a study showed that 58 women (0.38%) had abnormal cytology, among them, 37 women (63.8%) had ASCU and 20.7% had LSIL that was like the results of the present study **(21)**. Preventive measures like screening and prompt treatment of cervical cancer seem necessary, especially considering the study's higher prevalence of inflammatory and precancerous changes than other studies carried out in Iran and Muslim countries, as well as the impact of certain demographic variables and individual factors on abnormal results. Furthermore, since a sizable portion of the study's participants had never performed a Pap smear test highlights the need for an extensive screening program. These women lack adequate knowledge of cervical cancer screening procedures.

The main limitation of this study was that we did not include subjects with normal Pap smears. Therefore, it was not possible to compare the risk factors in people with normal and abnormal pap smears. Also, there was no significant evaluation between different subgroups of Pap smear with each other.

5. Conclusion

The current study's findings provided a broad overview of the pattern, prevalence, and demographic characteristics of abnormal findings in women with abnormal pap smears in the study area. These findings may serve as the foundation for more focused research in the future. To determine the prevalence of the risk variables examined in individuals with normal Pap smears and each of the subgroups of abnormal Pap smears, it is suggested to carry out follow-up research that includes individuals with normal Pap smears. Additionally, it is recommended to assess the incidence of aberrant Pap smear risk factors in various age, weight, and other categories.

6. Declarations

Acknowledgments

Authors would like to thanks all of women participated in this study.

Ethical Considerations

This study was conducted in accordance with the Declaration of Helsinki's tenets and with the authorization of the Ardabil University of Medical Sciences Ethics Committee (ethical code: IR.ARUMS.MEDICINE.REC.1401.114). The patients were not charged anything.

Authors' Contributions

All authors have equal continuation in this article. All authors read and approved the final manuscript.

Conflict of Interest

The authors declare no conflict of interest.

Fund or Financial Support

No funding was obtained.

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How to Cite This Article:

Mobaraki, N., Jalilvand, F., Amani, F., Azarinia, F. The Frequency of Clinical and Demographic Characteristics in Patients Exhibiting Abnormal Pap Smear Results. J Obstet Gynecol Cancer Res. 2025;10(6):475-80.

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