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Pap smear in Early Detection of Cervical Precancerous Lesions in Erbil

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Abstract

Background and objectives: Cervical cancer remains common. This may be because Iraq has no cervical cancer screening or human papilloma virus vaccination program. The goal of the study is to figure out how well the Pap smear works as a way to find cervical precancerous lesions also identify the prevalence of cervical cancer among women and to identify the potential risk factors for cervical cancer.

Methods: A prospective cross-sectional study conducted using closed end questionnaire tool for the purpose of data collection which started from 1st of October 2021 until 1st of September 2022. Convenient type of sampling was used in collecting data which include 470 women attending to cervical screening unit in Maternity Teaching Hospital, Erbil, Kurdistan Region /Iraq. The questionnaire composed of two main parts including the socio-demographic data of the patients such as age, gender, occupation, education level, religion, income status, age at the marriage, duration of marriage…etc. The result of pap smear and cone biopsy performed during colposcopy procedure to match the accuracy of pap smear.

Results: The findings revealed that 36% of the women aged between 40-49 years, the majority (80%) of them were married at the age of 15-24 years, 30% of their marriage lasted from 4-14 years, and most (72.6%) of them were housewives. The result of sensitivity, accuracy, positive and negative predicted value was equal to 45.6%, 97.7%, 80%, 89.9% respectively. The kappa test was 0.52 which indicate agreement between screening and gold standard test is a diagnosis of cervical cancer is still colposcopy-guided biopsy, which is then staged on the basis of the clinical examination and the outcome of imaging procedures, most obtained results were statistically significant.

Conclusion: Pap smear had a lower sensitivity, but a higher specificity in the current study. The most common complaint of the women was post-coital bleeding. Severe acute cervicitis was the most common finding for the Pap smear.

Keywords: Cervical cancer, Pap smear, Precancerous conditions, Screening.

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Introduction

Cervical cancer is considered the fourth most common type of cancer in women worldwide. In 2020, there was an estimated

604,000 new cases globally. This issue is of particular concern in low- and middle-income countries where about 90% of

Incidence and mortality from invasive squamous carcinoma of the cervix has declined in the past few decades primarily as the result of the introduction of Papanicolaou (Pap) smear screening. In contrast, there has been an increase in the relative incidence of adenocarcinoma as it is less likely to be detected by exfoliative cytology obtained with the Pap smear.[3, 4]

Cervical carcinoma is often presented as a precancerous lesion with a spectrum of intraepithelial neoplastic alterations called cervical intraepithelial neoplasia (CIN). The ability of cytological screening of the cervix to identify more than 90% of pervasive cervical cancer has led to the early detection and diagnosis of cervical cancer.[5,6]

The world health organization has recognised cervical cancer as a public health problem and subsequently established a global strategy to accelerate the elimination of cervical cancer with pre-set goals and target for 2020-2030. The strategy consists of three main pillars: prevention through HPV vaccination, regular screening and effective treatment of pre-cancerous lesions; and management of invasive cervical cancer.[7]

Cervical cancer, unlike most of other cancer, can be easily detected through screening which helps to identify and treat it in its early precancerous lesions stage; hence preventing its progression to cervical carcinoma. Both traditional and novel technologies can be used as screening methods to detect women with cervical precancers and cancers.[8]

estimated 342,000 total deaths due to cervical cancer in 2020 occurred.[1,2]

There are two main types of cervical cancer: squamous carcinoma (accounts for 85%) and adenocarcinoma (accounts for 15%). In addition, cervical cancer could also be subdivided into preinvasive and invasive lesions.

Uptake and participation in cervical screening program is found to be different among various ethnic and socioeconomic groups.[9] In resource-limited settings, there is an urgent need for non-cytological types of screening to identify carcinoma and its precursor lesions whereby cervical carcinoma keeps causing major morbidity and mortality.[10]

In Iraq, the WHO estimated a crude incidence rate of cervical cancer of about 1.4 per 100,000 women of all ages, with an estimated total death of 70,000 in 2019.[11] In 2020, Iraq had 193 annual number of deaths from cervical cancer, with about 286 new cases being diagnosed in each year; making cervical cancer the 12th most prevalent cancer among women aged 15-44 years.[12]

Therefore, the aim of this study to find the accuracy of Pap smear test in detecting early precancerous condition of cervix; and when any abnormal cells are detected, the confirmatory test (colposcopy and cone biopsy) would be performed.

Materials and methods

A prospective cross-sectional design was used for this current study. A closed ended type of questionnaire tool was used for the purpose of collecting the data that started from 1st of October 2021 until 1st of September 2022 assessing the Pap smear for early detection for cervical carcinoma. The data collected from the Maternity Teaching Hospital, Erbil governorate, Kurdistan Region /Iraq.

A convenience sampling technique was used and the sample size was calculated using Epi Info software, considering the following measures: population size= 1500, estimated frequency= 50% acceptable error (absolute precision) = 5% and confidence level= 99%. For the above data, the sample size was calculated to be 460. The total number of patients participated in the study eventually was 470 cases.

All women aged 21-65, who were sexually active and willing to participate were included in our study, while pregnant women and women with history of hysterectomy, as well as women aged above 65 years were excluded from the study.

A questionnaire tool was designed after reviewing literature, in order to be used for data collection from patients in Maternity Teaching Hospital. The questionnaire composed of two main parts including the socio-demographic data of the patients such as age, gender, occupation, education level, religion, income status, age at the marriage, duration of marriage…etc. The second part of the collected data comprised information about the assessment of the pap smear for early detection for cervical carcinoma such as Pap smear diagnosis, colposcopy and con biopsy for histopathological result.

The data were analyzed through the application of statistical Package for Social Science (SPSS, version 25). Frequencies and percentages were applied to calculate the categorical variables. Mean and SDs were calculated for continuous variables. Chi squared test was used to find the association between the categorical variables. A p value ≤ 0.05 was considered as statistically significant. Prior to conduct the study, ethical approval was obtained from the Research Ethics Committee at Kurdistan Higher Council of Medical Specialties and consent of DOH and maternity hospital to conduct the study. During the study, confidentiality and anonymity of patients were protected and prior to their participation in the study verbal consent was obtained from them.

Results

Out of 470 participant women in current study, 36% of them were from 40-49 years, 34.7% of subjects were from 30-39 years, only 5.1% of them aged between 60-69 year. Table (1) shows that, according to PAP smear diagnosis, nearly a quarter (25.5%) of participants had severe acute cervicitis, followed by 10.9% of them had moderate cervicitis and only 3% of them had mild acute cervicitis, 12.% of the cases diagnosed to have ASCUS, patients diagnosed with CIN type 1,2 and 3 with percentages of 17.9%, 4% and 9.6% respectively, only 0.9% of sample subjects had moderate chronic cervicitis and severe chronic cervicitis .

According to histopathological diagnosis; 7 of the participants had severe acute cervicitis, followed by 0.9% of who had moderately sever acute cervicitis and only 2.1% of them had mild acute cervicitis, patients diagnosed with CIN type 1, 2 and 3 most (66.4%) of them diagnosed with CIN 1, only 1.9% of cases had CIN 2 and 16.8% of them was CIN 3 finally, only 1.1% of patients had erosive cervicitis. Table (1).

Table (2) reveals that we used PAP smear as screening tool for cervical pre-cancer and compared it with the gold standard test (histopathology). The sensitivity was 45.6%, specificity was 97.7%, PPV was 80%, and NPV was 89.9%**,** Kappa test was 0.52 measure of agreement between screening and gold standard test, all these findings were statistically significant and p-value was <0.001.

Results of Table (3) reveal that there was significant statistical association between PAP smear and age, positive PAP smear

increased by increasing age 5.5% of positive cases were 30-39 years, 13.6% of them were 40-49 years, 50-59 years patients participated in 11.3% of positive PAP and the maximum amount among age group was 16.7% positive cases were 60-69 years, all (100%) of negative samples were 20-29 years. There was significant statistical association between PAP smear and duration of marriage, among duration of marriage the most common years were 25-34 years, 15-24 years and 35-44 years with 11.8%, 11.9% and 16% respectively showed how many years the marriage last in positive PAP smear cases. There was statistically significant association between PAP smear and economic status, 12.6% of positive PAP had moderate economic status and only 10% of them were in low status while all (100%) of negative PAP subjects were in high economic status. There was statistically significant association between PAP smear and occupation, 11.7% of positive PAP samples identified as housewives while only 3.9% of them were employee. There was statistically significant association between PAP smear and educational level, among them highest positive PAP (16.2%) had basic degree, 12.2% of positive cases were illiterate while only 3.7% of them hold higher education degree. There was significant statistical association between PAP smear and contraceptive method, all (100%) of positive cases used injection in reverse to all (100%) of negative PAP smear cases used local method, 16.4% of positive samples took pills, 10.4% of them used IUCD while 6.8% of positive PAP utilized more than one method. There was significant statistical association between PAP smear and PMH, all (100%) of negative PAP smear sample sizes had HTN, DM and IHD, 16% of positive cases had more than one disease while 8.2% of them had no past medical history. Chi square test was used and p-value was <0.05.

Table (1): PAP smear and histopathology diagnosis.

Variables	Categories	Frequency	Percent
PAP smear diagnosis	mild acute cervicitis	14	3
	moderate acute cervicitis	51	10.9
	severe acute cervicitis	120	25.5
	moderate chronic cervicitis	4	0.9
	severe chronic cervicitis	4	0.9
	ASCUS	57	12.1
	CIN 1	84	17.9
	CIN 2	19	4
	CIN 3	45	9.6
	Erosive Cervicitis	58	12.3
	Endocervical Polyp	5	1.1
	Moderate HSIL	9	1.9
	moderate acute cervicitis	4	0.9
	severe acute cervicitis	33	7

histopathology diagnosis	mild chronic cervicitis	10	2.1
	moderate chronic cervicitis	9	1.9
	CIN 1	312	66.4
	CIN 2	9	1.9
	CIN 3	79	16.8
	Erosive Cervicitis	5	1.1
	Endocervical Polyp	9	1.9
	Total	470	100

Table (2): Sensitivity, specificity, PPV and NPV of PAP smear as screening test for cervical pre-cancer.

			Histopathology			
			positive	negative	Total	p-value
PAP smear	positive		36	9	45	<0.001
	negative		43	382	425	
Total			79	391	470	

Table (3): Association of PAP smear and age, duration of marriage, economic status, occupation, educational level, contraceptive method and PMH.

Variable	Categories	PAP smear		p-value
		Positive	Negative	
Age	20-29 years	0 (0%)	34 (100%)	0.021
	30-39 years	9 (5.5%)	154 (94.5%)	
	40-49 years	23 (13.6%)	146 (86.4%)	
	50-59 years	9 (11.3%)	71 (88.8%)	
	60-69 years	4 (16.7%)	20 (83.3%)	
Duration of marriage	4-14 years	4 (2.8%)	137 (97.2%)	0.010
	15-24 years	19 (11.9%)	141 (88.1%)	
	25-34 years	14 (11.8%)	105 (88.2%)	
	35-44 years	8 (16%)	42 (84%)	
Economic status	Low	9 (10%)	81 (90%)	0.001
	Moderate	36 (12.6%)	249 (87.4%)	
	high	0 (0%)	95 (100%)	

Occupation	Housewife	40 (11.7%)	301 (88.3%)	0.010
	Employee	5 (3.9%)	124 (96.1%)	
Education level	Illiterate	9 (12.2%)	65 (87.8%)	0.003
	Basic	23 (16.2%)	119 (83.8%)	
	Secondary	9 (6.2%)	136 (93.8%)	
	higher education	4 (3.7%)	105 (96.3%)	
Contraceptive method	no contraceptive use	14 (9%)	142 (91%)	<0.001
	local method	0 (0%)	15 (100%)	
	Pill	9 (16.4%)	46 (83.6%)	
	IUCD	5 (10.4%)	43 (89.6%)	
	Injection	4 (100%)	0 (0%)	
	more than one method	13 (6.8%)	179 (93.2%)	
PMH	None	22 (8.4%)	241 (91.6%)	0.008
	HTN	0 (0%)	39 (100%)	
	DM	0 (0%)	19 (100%)	
	IHD	0 (0%)	5 (100%)	
	more than one disease	23 (16%)	121 (84%)	
Total		45 (9.6%)	425 (90.4%)	

Discussion

Cervical cancer is prevalent and this may attributed to reason that Iraq has no national screening program for cervical cancer and no HPV vaccination program as a preventive measure.[11] An effective method to prevent the development of cancer of cervix is through the use of Pap smear test as a screening tool to identify precervical cancer.[13, 14]

Present study found that 17% of our sample were in the age group of 50-59, 36% of the sample were in the age group of 40-49 years, and 34.7% of subjects were in the age group of 30-39 years. This is precisely in accordance with the findings of a study by Bhattacharyya[15] in which 16% of the cases were between 50-59, 36% of the cases were between 40-49 years, and 34% were between 30-39 years. In addition, the same result of study reported in Bihar (India) which revealed 39% of the sample were between 31–40 years which was the most common age group in the study. [14]

The duration of the marriage of the majority of the cases in the current study lasted 25 years and more and this is comparative to another study in India where the duration of the marriage was more than 20 years for most of the cases.[15]

In the present study, the chief complaint of the women was post coital bleeding (34.5%). and 7% with intermenstrual bleeding which is in contrary to result of study that done in India which revealed postcoital bleeding and intermenstrual bleeding in rate 3,09, 13% respectively.[13]

In the current study depending on pap smear and histopathology diagnosis represent, 84 (17.9%) patients diagnosed with CIN type 1, 19 (4%) patients diagnosed with CIN type 2

and 45 (9.6%) patients diagnosed with CIN type 3. However, another study in turkey reported that the total of 51% of cases had CIN type 2 and 47% had CIN type 3 or cancer.[16] In addition, Ibrahim et al reported that 8 (22.9) cases had CIN type 1 and 12 (34.3) cases had CIN type 2, and 12 (34.2) patients diagnosed with CIN type 3 depending on pap smear.[17]

The current analysis identified that around 26% of participants diagnosed with severe acute cervicitis and 57 (12.1%) diagnosed with ASCUS. Barut et al found that the Pap smear results were ASCUS for 29 patients (6.4%).[18]

The sensitivity and specificity obtained from present data was 45.6% and 97.7% respectively while in previous studies like Bhattacharyya et al [15] found that sensitivity was 52%, and the specificity was 95%. Additionally, another study in Rawalpindi, reported the 38.8% sensitivity and 71.8% specificity for Pap smear. Akhter et al and Cheserem et al[19, 20] also reported 50% sensitivity and 57% specificity for Pap smear. However, Consul et al[21] documented that sensitivity was 84.2%, and the specificity was 62.1%. Huy et al[22] found higher (58.0%) sensitivity and lower (85.2%) specificity. Mostly the sensitivity of previous researches higher than what obtained by current study on the other hand the specificity of present study is higher than the specificity of all mentioned pervious study.

Conclusion

Pap smears can be categorized as very effective screening tool for cervical cancer and histopathological examination remains the mainstay. Pap test in terms of its sensitivity, specificity, positive predictive value, negative predictive value, and accuracy. It can serve as a primary screening alternative test for cervical cancer. For Kurdistan region in which people mostly had poor economic outcomes it will be very good test because its cost less comparing to visual inspection with acetic acid (VIA) which is very cost effective.

Conflict of interest

The researchers declare that there is no any conflict of interest.

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