



Comparison Between Cervical Pathology Screening Techniques and Conizations

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Original Article

Abstract

Background: The initial stage of cervical cancer screening frequently involves the identification of an atypical outcome from either an HPV (human papillomavirus) test or a Pap smear. This outcome will necessitate further diagnostic testing that has the potential to identify precancerous conditions or cervical cancer.

Objective: To analyze the population characteristics and diagnostic methods of cervical pathology for the prevention of cervical cancer of three Iraqi hospitals to improve and unify screening and prevention programs.

Material and methods: A retrospective study of the demographic and clinical characteristics of 408 women with cervical uterine pathology diagnosed in 3 Iraqi hospitals in Baghdad city. The risk factors, the diagnostic process and the treatment indication of two groups are compared: those that required cervical conization (n=222) and those that did not require surgical treatment (n=186).

Results: Conized women used more hormonal contraception and have a higher smoking habit while the number of sexual partners is higher in non-conized patients. More than 50% of patients with positive cervical biopsy presented an equal or more serious result in the pathological anatomy of the surgical piece. There are significant differences in sensitivity and positive predictive value of cytology and HPV determination between hospitals.

Conclusion: In our midst, the conized women have different clinical and epidemiological characteristics than non-conized women, there are differences between the diagnostic techniques of different hospitals and however the concordance between biopsy and cone result is high. There is still a need for proper health education in relation to vaccination in women with cervical pathology.

Keywords: cytology, conization, HPV determination, cervical lesions

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1. INTRODUCTION

Cervical cancer (CC) is the fourth most common cancer among women globally in the world. Screening healthy women using cervical cytology has proven effective, due to the detection of asymptomatic premalignant lesions whose treatment prevents their progression to invasive carcinoma (1). According to current statistics in Iraq, it has been determined that an annual average of 286 women receive a diagnosis of cervical cancer, resulting in 193 fatalities attributed to this disease. Cervical cancer is positioned as the 15th most prevalent form of cancer among women. Cervical cancer ranks as the twelfth most prevalent kind of cancer among women between the ages of 15 and 44 (2). Currently, an increase in the incidence of preinvasive forms has been observed, due to improvements in early diagnosis, which is accompanied by a decrease in the mean age of onset and mortality associated with CC (3). In the last two decades, human papillomavirus (HPV) has been confirmed as the causal agent of practically all CC and its precursor lesions (4). The initial step in cervical cancer screening frequently involves the identification of an atypical outcome from either an HPV (human papillomavirus) test or a Pap smear. This outcome will necessitate further diagnostic tests aimed at identifying precancerous conditions or cervical cancer. The Pap test and the HPV test are classified as screening tests rather than diagnostic testing. The ability to definitively ascertain the presence of cervical cancer in an individual remains uncertain. Additional testing is necessary to ascertain the existence of cancer or precancer in the event of an abnormal Pap smear or HPV test result (5-7). The presence of signs such as abnormal vaginal bleeding or dyspareunia may raise suspicion of cervical cancer. Typically, medical professionals such as primary care physicians or gynecologists possess the capability to conduct the requisite examinations for the purpose of diagnosing malignancies and precancers. In addition, it is possible for them to provide treatment for precancerous conditions.

Types of cervical biopsies

There exists a diverse range of cervical biopsy procedures that are employed for the purpose of diagnosing cervical malignancies or precancers. If the biopsy is able to fully excise all aberrant tissue, it is possible that this intervention alone may suffice as the sole course of treatment (8).

Colposcopic biopsy

In this particular biopsy procedure, the cervix is initially subjected to colposcopic examination in order to identify any spots displaying aberrant characteristics. Biopsy forceps are employed for the purpose of extracting a minute segment, approximately measuring 1/8 inch, from the anomalous region situated on the external surface of the cervix. The biopsy procedure may elicit mild cramping, temporary pain, and minor bleeding following the procedure (9).

Endocervical curettage (endocervical curettage)

In cases when colposcopy fails to identify any anomalous regions or when the colposcope is unable to visualize the transformation zone, another approach must be employed to assess the presence of cancer in that specific area. A slender medical instrument, such as a curette or brush, is introduced into the endocervical canal, which refers to the region of the cervix in closest proximity to the uterus. The curette or brush is employed to mechanically abrade the inner lining of the canal, facilitating the extraction of a portion of tissue. This extracted tissue is subsequently dispatched to the laboratory for meticulous analysis and evaluation. Following the completion of this surgery, patients may have cramping sensations and may also encounter episodes of bleeding (10).

Cone biopsy

In this medical operation, popularly known as conization, the physician removes a cone-shaped section of cervical tissue. The structure in question has a conical shape that consists of two distinct parts: the exocervix and the endocervical canal. The exocervix is the outer component of the cervix, while the endocervical canal forms the apex or tip of the cone. The excised tissue obtained from the cone biopsy procedure includes the transformation zone. This zone serves as the boundary between the exocervix and endocervix and is widely acknowledged as the principal location for the occurrence of malignancies and precancerous conditions (11). A cone biopsy can serve as a therapeutic intervention for the total excision of various pre-cancerous lesions, as well as early-stage malignant tumors. Two often employed techniques for doing cone biopsies include the loop electrosurgical excision process (LEEP), which is also referred to as large loop excision of the transformation zone (LLETZ), and cone biopsy using a cold scalpel.

- **Loop electrosurgical excision procedure (LEEP, LLETZ):** This technique involves the excision of tissue using a slender wire of looped shape, which is electrically heated and functions as a little knife. The administration of local anesthesia is employed for this particular medical operation, which can conveniently take place within the confines of the physician's office.
- **Cold knife cone biopsy:** The aforementioned procedure is conducted within a medical facility commonly referred to as a hospital. In lieu of a heated wire, a surgical knife or laser is employed for the excision of tissue. During the surgical procedure, patients will be administered anesthesia, which can be either general anesthesia inducing a state of unconsciousness, or spinal or epidural anesthesia involving the injection of a numbing agent into the region surrounding the spinal cord to induce numbness from the waist downwards (13).

Potential problems associated with cone biopsies encompass hemorrhaging, infection, and cervical stenosis. The performance of any variant of cone biopsy does not generally result in infertility among the majority of women. However, in cases where a substantial amount of tissue is excised, there exists a heightened probability of experiencing premature birth (14).

2. PATIENTS and METHODS

Retrospective study that includes patients from three general hospitals (regional, general and tertiary). All patients undergoing cervical conization in the regional and general hospitals between 2016 and 2018 are collected, the first 25 operated on each year in that same period of time in the tertiary hospital and a balanced sample with patients from the pathology consultation. The age of marriage, the type of contraception, the smoking habit and the age of the first child are assessed. The results of the biopsy and the pathological anatomy of the cone in those that have been performed are compared. The degree of lesion in the biopsy, the HPV genotype, the determination technique, and the patient's age are recorded. The sensitivity and positive predictive value of cytology and the different HPV determination techniques are calculated using biopsy as the “gold standard”. All the results obtained have been compared between the different hospitals and between patients older and younger than 30 years old.

3. RESULTS

A total of 408 women have been collected, 222 conized and 186 non-conized. The average age of initiation of marriage is 18.2 years in both groups. The average age at which they had their first child is 27.1 years old in the conized group, and 25.7 years old in the non-conized group ($p < 0.0001$). 11.89% of the conized patients are smokers and 9.24% of the non-smokers ($p = 0.6$). The contraceptive methods used in the two groups are presented in (**Table 1**). The type of contraceptive in relation to the presence of cervical lesion is presented below (**Table 2**). 50% of the Pathological Anatomy studies of the conization pieces coincide with the results of the biopsy guided by colposcopy. In 21.6% of cases, the presence of a higher grade lesion is reported, so the cone would be correctly indicated. In 28.4% of patients a lower grade injury was confirmed. In the total sample, significant differences have been observed in the case of a biopsy suggestive of CIN III, and breaking down by hospital, significant differences have also been observed in the case of CIN II in the tertiary hospital, and in CIN II and III in the general hospital. In the tertiary hospital the HPV determination technique is conventional cytology with PCR, in the general hospital liquid cytology and real-time PCR determination and in the regional hospital both have been used in the study period. Among the 408 women with cervical pathology who have been typed for HPV, 69.8% have a high-risk genotype and 2.69% have a low-risk genotype, with the rest being negative. Among high-grade lesions, 83.9% of HPV is high risk and 1.4% is low risk, with low-risk lesions being 69.2% and 7.7% respectively. There are no significant differences between the presence of high-risk HPV among the three hospitals. No significant differences were found in the prevalence of HPV between those over and under 30 years of age. In the total number of patients in our sample, both cytology and HPV determination have a similar sensitivity compared to biopsy, around 82%, and a positive predictive value of 84.91% and 84.78% respectively, with no differences found. statistically significant between both ($p > 0.05$). In the tertiary hospital the sensitivity of HPV is 61%, while in the regional hospital it is 90.32 and in the general hospital it reaches 100%. The PPV of HPV in the tertiary hospital is 98.63%, in the general hospital it is 76.25% and in the regional hospital it is 87.5%. The sensitivity of cytology is 74% in the tertiary hospital, 83% in the general hospital and 98.5% in the regional hospital. The PPV of cytology in the tertiary is 94%, in the general 79.13% and in the regional 81%. The sensitivity of HPV in those over and under

30 years of age and the positive predictive values, as well as the sensitivity and predictive value of cytology in these age groups are all presented in (Table 3).

Table 1. The contraceptive methods used in the studied groups

Contraceptive	Conized	No conized	P. value
No contraception	54.8%	47.3%	0.01
Contraceptive	45.2%	52.7	0.03

Table 2. Type of contraceptive in relation to the presence of cervical lesion in the studied groups

Variable	Cervical lesion	No- Cervical lesion	P. value
Hormonal method	23.7%	7.5%	<0.005
Non- hormonal method	52.2%	16.5%	<0.001

Table 3. Sensitivity of HPV according to age

Variable	≥30 years	< 30 years	P. value
HPV sensitivity	82.1	81.01	0.91
PPV HPV	85.85	82.05	0.42
Cytology Sensitivity	82.09	84.7	0.63
PPV Cytology	87.85	78.26	0.02

4. DISCUSSION

CC is one of the tumors with the greatest relevance in terms of incidence and mortality in young women. The possibility of primary prophylaxis and cost-effective population screening poses the challenge of finding the most appropriate strategy to reduce the risk as much as possible. The current study of the state of screening serves to evaluate the strategies carried out and try to optimize future ones (15). In the patients of our sample the number of sexual partners is significantly higher in non-conized patients, which may be contradictory with the data on risk factors previously collected as those find by many researchers (16,17). It must be taken into account that this is a retrospective study, so there may be bias due to data being inconsistently collected in the histories as well as due to the lack of reliability of clinical interviews carried out outside of ideal conditions. The non-use of contraception is greater in the non-conceived patients in our sample, which could be explained by being older women, with more possibilities of having a stable partner or reproductive desire. With the results obtained, the surgical indication for conization is satisfactory given the high degree of agreement between the biopsy and the definitive pathological result. Although in some cases the observation of a lower grade lesion in the definitive pathological anatomy may be due to an overestimation of the biopsy, in other cases it may be attributed to a therapeutic action on the pathological area during sampling. This study highlights the appearance of significant differences in the sensitivity and positive predictive value of cytology and HPV determination between hospitals. The heterogeneity between screening techniques may explain these differences between hospitals in the same region, underestimating the presence of HPV with some of the methods (18). As described in other studies, the conventional cytology method makes it difficult to visualize all the cells, which makes it a more complex and less sensitive method than others such as liquid cytology. In relation to the determination of HPV, there are currently 140 methods on the market, each with different sensitivities and specificities as well as different levels of standardization, which may explain the differences obtained (19). Contrary to what is described in the Iraqi Cervical Cancer Consensus Document and the 2014 Cervical Cancer Prevention Guide, in our sample the use of HPV determination only in people over 30 years of age is not supported since we have not found statistically significant differences between these two age groups (20).

5. CONCLUSIONS

The most notable conclusions of this study are that the agreement between the biopsy and the cone result is high, that the different techniques used to determine HPV lead to different effectiveness of the screening methods, that in our sample the one of the determination of HPV as a complement to cytology only in those over 30 years of age and that correct health education in relation to vaccination in women with cervical pathology is still necessary.

Ethical Clearance:

Ethical issues were taken from the research ethics committee. Informed consent was obtained from each participant. Data collection was in accordance with the World Medical Association (WMA) declaration of Helsinki for the Ethical Principles for Medical Research Involving Human Subjects, 2013 and all information and privacy of participants were kept confidentially.

Conflict of interest: Authors declared none

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