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Prevalence and Risk Factors of Cervical Neoplastic Lesions in Patients Attending a Healthcare Specialty Clinic, King Abdulaziz Medical City, Saudi Arabia

Maha M. Shalabi[1], Rawaa I. Ismael[2], Saeed ur Rahman[3], Hind Al Shatry[3]

[1]Department of Obstetrics and Gynecology, King Abdulaziz Medical City, Riyadh, KSA
[2]Almarefa College, Riyadh, KAS
[3]Department of Family Medicine and Primary Health Care, King Abdulaziz Medical City, Riyadh, KSA
Email: msh1111@yahoo.com

Abstract

Background: Screening programs for cervical neoplasm among women in the Kingdom of Saudi Arabia (KSA) are very limited. **Objective:** To investigate the prevalence and risk factors of cervical epithelial abnormalities among patients attending a health care specialty center (HCSC) of King Abdulaziz Medical City, Riyadh, KSA. **Design:** A questionnaire was developed to collect information about socio-demographic variables followed by cytopathological analysis of Papanicolaou (Pap) smear. Settings: Female patients attending the gynecology clinic in the HCSC for cervical abnormalities during 2006 and 2008 were selected for the study. **Subjects and Methods:** Pap smear was collected and subjected to cytopathological analysis, which was further classified according to the revised Bethesda 2001 system. Information on socio-demographic variables, type and duration of oral contraceptives usage, active or passive smoking, history of sexually transmitted disease, or cervical cancer was collected by trained healthcare professionals. Results were analyzed using chi-square test and t-test. Main outcome measures: Lower frequency of cervical lesions among KSA females in comparison with the western countries. **Results:** A total of 495 Pap smears were studied, out of which 31 Pap smears were found to be unsatisfactory and therefore excluded. Among the remaining Pap smears, 6.5% were found to be abnormal; however, this was not statistically significant. None of the studied socio-demographic factors were found to be significantly correlated with the appearance of abnormal Pap smears, except for passive smoking. **Conclusion:** Saudi Arabia had a lower frequency of cervical lesions in comparison with the western countries. Further, this study can serve as a

pilot study for a larger national screening program for the identification of prevalence and risk factors of cervical lesions in the women of KSA. **Limitations:** Cases included in the study belong to the particular period, and patients with abnormal Pap smears were not followed up. In-extension, the included data were not restricted for a particular community.

Keywords

Screening, Prevalence, Cervical Cancer, Cervical Epithelial Lesions

1. Introduction

Cervical neoplasm has been reported as the third most common type of malignancy prevalent among women worldwide with high mortality rates [1]. This mortality index was found to be large in developing, low, and middle-income countries due to the insufficient medical amenities required for its early detection [2] [3]. In the Kingdom of Saudi Arabia (KSA), the incidence of cervical neoplasm is comparatively low, contributing approximately 2.4% of total cases of cancer [1]. Data published in Saudi Gazette (2014) reported that approximately 37% of mortality was observed in females suffering from cervical cancer.

Cervical cancer mainly involves alterations in squamous epithelial cells of the cervix (cervical intraepithelial neoplasia—CIN) resulting in the development of complex lesions, called high-grade squamous intraepithelial lesions (HSIL) [4]. While the etiology of cervical cancer is multi-faceted, human papillomavirus (HPV) stands as the most important risk factor for CIN. Studies revealed that HPV is prevalent in approximately 85% - 99% of cervical neoplasm cases worldwide and a similar trend was observed in KSA [5]. Other risk factors include age at first intercourse and the number of sexual partners [6] [7] [8]. Smoking, socio-economic status, abnormal Papanicolaou (Pap) smears history, previous exposure of vulnerable vaginal diseases, inflammation, poor genital hygiene, multiple pregnancies, malnutrition, use of oral contraceptives, and lack of awareness also increase the risk of HPV infection [3] [9].

Although the prevalence rate of cervical cancer is low in KSA, the existing cases were diagnosed at a more advanced stage where extensive chemo-radiation therapy was needed [10] [11]. This is perhaps due to the absence of proper screening programs [6]. Despite the great advancements in the healthcare services in KSA, no organized screening program was developed either in KSA or at King Abdulaziz Medical City (KAMC). Cervical cancer can be effectively prevented, if the precancerous lesions can be screened at a much earlier stage, followed by their earlier treatment. In ideal circumstances, vaginal screening should be performed every 6 months to detect abnormalities and initiate secondary treatment for complete cure. The screening modalities commonly used in cervical neoplasm include cytology, visual inspection, and HPV test [3]. In

cytological assessments, Pap smear test is most widely used in which the cells from the squamo-columnar junction of the cervix were scrapped and fixed on a glass slide for evaluation [12]. Despite its limitations, such as high false-negative rates, low sensitivity, subjective interpretation, and low predictive value [13], this screening method has continued to be the significant contributor in the reduction of mortality rates by 70% in developing countries. However, in the case of KSA, limited studies are available describing the frequency and detection of CIN and carcinoma through Pap smears [5] [14] [15]. To bridge this gap, the present screening program was conducted at a health care speciality center (HCSC) of King Abdulaziz Medical City, which may also act as a pilot study for development of a national screening program.

2. Methods

Married female volunteers aged between 18 - 70 years were included in the study. Pregnant women, women menstruating at the time of test, and elderly women were excluded from the study. Pap smear samples were collected from 495 females attending the HCSC of King Abdulaziz Medical City, Riyadh, KSA between January 2006 and December 2008 under the primary program of basic cervical lesions screening using cytology.

The guidelines followed for the screening were similar to those adopted by the American College of Obstetrics and Gynecology. According to the guidelines, the Pap smear test should begin at the age of 18 years or once sexual activity started. A woman with 3 normal Pap smears in a year can decrease the frequency of the test based upon her gynecologist's suggestion. The maximum duration for elapse between 2 Pap smears should be 3 years. Also, women aged 70 years or more with 3 normal Pap smears along with no abnormal report in the last 10 years can stop the practice [16]. Women who have undergone hysterectomy were selectively included for screening based upon the presence of high risk factors and symptoms like vaginal discharge, abdominal pain, dyspareunia, and backache.

The study was conducted after obtaining ethical approval from the Institute's Family Medicine department. All female participants were informed about the study procedures, occurrence of possible abnormalities including cervical cancer, and use of further invasive procedures if required, based upon the results of Pap smear screening. Proper documented consent was obtained from all the participants.

Data was collected from all the participants through a developed questionnaire, which included questions regarding their background, age, parity, marital status, number of sexual partners, years of marriage, social class, education level, type and duration of use of oral contraceptives, smoking habits, passive exposure to smoking, history of sexually transmitted disease, and family history of cervical cancer. The interviews were conducted by trained healthcare professionals, and the results were analyzed using chi-square test and t-test.

For cytopathological examinations, the smear from the cervix was collected by a gynecologist using the endocervical brush, and the liquid based sample was carefully transported to the main lab in the hospital for further screening by the cytopathologist. The smears were classified according to the revised Bethesda 2001 system [17]. According to this system the collected specimens were classified as satisfactory or unsatisfactory for evaluation mentioning the specific reason for sample exclusion. Further the selected samples were categorized as negative or positive for intraepithelial lesions or malignancy, as well as cases that are at higher risk for malignancy development. Specimens designated as negative for intraepithelial lesions or malignancy were checked for several factors such as presence of pathogenic microorganisms, non-neoplastic findings, cellular changes associated with inflammation, radiation, or intrauterine contraceptive device, status of glandular cells after hysterectomy, atrophy, etc. On the contrary, specimens designated as positive for intraepithelial lesions or malignancy were appropriately identified for atypical squamous cells (ASC), low-grade and high grade squamous intraepithelial lesion (LSIL, HSIL), atypical glandular cells (AGC); adenocarcinoma or other factors of importance.

The women with ASCUS (atypical squamous cell of undetermined significance) were advised to repeat the Pap smear after 3, and 6 months. Cases with persistent ASCUS and LSIL (low-grade squamous intraepithelial lesion) on repeated Pap smearswere recommended to King Fahad Hospital (KFH), Riyadh, KSA for colposcopic evaluation and biopsy, if required. Similarly, females with ASCUS and HSIL were referred for immediate colposcopic evaluation and biopsy confirmation. All the biopsies were taken within 1 - 3 months of the final diagnosis.

In the present study, HPV testing was not undertaken as the test facility was not available at the reference lab during the study conduct.

3. Results

3.1. Cytopathological Outcomes

Table 1 represents the results of investigated Pap smears evaluated in the HCSC. A total of 495 Pap smears were studied, out of which 31 (6.3%) Pap smears were excluded as they were found to be unsatisfactory. Among the remaining 93.7% Pap smears, 6.5% showed prevalence of pre-cancerous lesions; however, this was not statistically significant. Further, among 6.5% of positive specimens, 89.7% showed ASCUS, whereas 3.4% and 6.8% were found to be with ASC-H, and LSILHPV (low-grade squamous epithelial lesion encompassing human papilloma virus and other lesions), respectively (data not shown). No cases were reported with cervical cancer.

3.2. Relation between Pap Smear and Socio-Demographic Factors

The relationship between the results of the Pap smear (normal or abnormal) and the studied socio-demographic variables were analyzed using Chi-square test.

Table 1. Prevalence of abnormal Pap smears.

	Normal	Abnormal	Total
Frequency	434	30	464
Valid percent	93.5	6.5	100

None of the studied socio-demographic factors like history of sexually transmitted disease or cervical cancer, smoking habits, social status of women, and educational level were found to be significantly correlated with the appearance of abnormal Pap smears. Interestingly, passive smoking was found to be statistically correlated ($P < 0.05$) with the prevalence of abnormal Pap smear, indicating its effect over the cervix of females. Table 2 demonstrates the effect of passive smoking on appearance of abnormal Pap smears. The results indicate that among the total cases of abnormal Pap smears, 12.4% falls into the group that was exposed to passive smoking.

T-test was applied to evaluate the relationship between the results of the Pap smear (normal or abnormal) and the duration of contraceptives use; however, it was also found to be statistically insignificant.

4. Discussion

In the present study, data for abnormal Pap smears for the years 2006-2008 were retrieved from the Pathology Department of KAMC, Riyadh, KSA and classified according to the updated Bethesda 2001 system. The current study also reported the limited prevalence (6.5%) of pre-cancerous lesions, which are in accordance with the previously published reports [5]. In these studies, the prevalence of cervical cancer was found to be lower in Muslim women from Middle Eastern countries and other nearby geographical areas when compared with other countries. This may be due to the Islamic Shareeah law, which strictly prohibits any pre-marital sexual relationship with severe punishments. A partial increase in the cervical lesions incidence in this study was maybe due to the usage of advanced Pap smear test, which is comparatively more sensitive than the conventional smears used in the previous published reports. 18 Moreover, the provision of multiple marriages, or early marriage, still continued to be an important risk factor for the increased vulnerability of HPV infection and thereby cervical cancer progression among Muslim women [10].

Further, among all the studied socio-demographic variables, a significant association between the abnormal Pap smears and passive smoking was observed. However, this finding might have been influenced with the selection of sample size as most of the female participants were already attending the health care center and therefore have restricted exposure to the adverse conditions as a precautionary measure.

Although the study had its own limitations, such as the cases included in the study belong to the particular period, patients with abnormal Pap smears were not followed up, and the data included is not restricted to a particular

Table 2. Exposure to cigarette smoking.

	Exposure to cigarette smoking		Total
	Yes	No	
Pap smear result			
Normal	89	332	421
Abnormal	11	16	27

community, it fulfills all the requirements needed to be considered as a pilot study for a national screening program. Another limitation of the study was the lack of DNA testing for HPV due to unavailability of the services during the study tenure. Although the World Health Organization has declared HPV as a causative agent for cervical cancer, Pap smear screening continues to be the primary method for basic screening of cervical lesions and HPV testing may be used as a next step in cervical cancer screening [14]. However, at present many reference labs in KSA have started working towards the establishment of the HPV test as a part of future cervical lesion screening programs.

5. Conclusion

Based upon the present study findings, it is concluded that Saudi Arabia had a lower frequency of cervical lesions in comparison with western countries, which could be related either to the stringent Islamic rules regarding sexual relationships, or to other environmental and genetic factors that require further investigations.

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