



Research Article

Pattern of Changes in Papanicolaou Smears for Patients Visiting Alwazart PHC, Riyadh, Saudi Arabia

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Abstract

Tests such as the Papanicolaou smear are considered the gold standard for cervical cancer screening, which is available in almost every public health center and very effective in early detection of malignant or even premalignant lesion. **Aim:** Promote early detection of changes in pap smears and improve services in well women health clinics. **Methods:** This descriptive cross-section study was conducted in Alwazart primary healthcare center, Riyadh, Saudi Arabia for all women whose age above 21, and pap smear test done in July 2015-July 2020 were included. **Results:** In our study, pathological cervical cell changes begin at an earlier age, with atypical squamous cells of undetermined significance starting at a median age of 28. Nonetheless, low grade squamous interepithelial lesions were common in 35-year-olds. Atypical glandular cells and low grade squamous intraepithelial lesions were found in 1.4% of Pap smears. The median age of the study group was 44.88. **Conclusion:** Pap smears in our community show abnormal cellular changes at an earlier age. The most effective preventive methods for cervical cancer are routine screening and vaccination against HPV.

Keywords: Primary care; Women health; Pap smear screening; HPV vaccine; Human papillomavirus

Introduction and Literature Review

In women, cervical cancer refers to an abnormal proliferation of cells in the cervix that can spread to adjacent tissues or organs or even beyond when metastases occur. Cancer of the cervix is the fourth most common cancer among women globally, with an estimated number of new cases from 2020 to 2040, from 604,000 to 798,000 [1,2]. And, according to Saudi Arabian statistics, it is the eighth most common cancer among women. With an estimated number of new cases from 2020 to 2040, 179 to 416.2 Almost all cases of cervical cancer (99%) can be attributed to Human Papillomavirus infection [3,4]. Human Papillomavirus vaccination and screening are effective measures to prevent cervical cancer. It is expected that HPV vaccinations will prevent around 3% of cervical cancers in Saudi Arabia [5]. There are three types of Human Papillomavirus vaccines that have been licensed by U.S. Food and Drug Administration (FDA) which protect against Human Papillomavirus type 16 and 18 which are the cause of most

of Human Papillomavirus cervical cancer. Types of vaccines are; bivalent (Cervarix) which protects against Human Papillomavirus types 16 and 18, quadrivalent (Gardasil) which protects against Human Papillomavirus types 6, 11, 16 and 18, and, Gardasil-9 (Merck) which protects against Human Papillomavirus types 6, 11, 16, 18, 31, 33, 45, 52, and 58 [6]. Vaccines are available in some tertiary governmental and private hospitals in Saudi Arabia and are offered with or without fees and prescribed by physicians upon patients request. Human Papillomavirus can be easily detected by pap smear which is the gold standard for cervical cancer screening [7]. Pap smear screening has shown an impressive reduction in incidence and mortality of cervical cancer worldwide [8,9]. In this procedure, a small brush is used to gently remove the cells from the surface of the cervix and the surrounding area will be examined under a microscope to determine if there is cervical cancer or if cell changes leading to cancer have occurred. Additionally, a Pap test may help detect other conditions, such as infection or inflammation. Despite the low incidence rate of cervical cancer in Saudi Arabia, which accounts for 2.4% of all new cases with a mean age of 53 [10,11]. Cervical cancer screening has been proved to be effective

in detecting pre-invasive stages of the disease and attempting to decrease its associated mortality. To use an elimination strategy, we must know how serious the disease is. Although there is little data regarding Human Papillomavirus prevalence in Saudi Arabia, a plan to eliminate cervical cancer in the country is still needed [7]. More research is required to determine the prevalence of Human Papillomavirus in Saudi Arabia [7]. And it is necessary for the Saudi health services to start public education and screening programs nationwide to achieve one of Saudi health sector goals in transformation strategy of vision 2030 which encourages primary and secondary prevention [12].

Using this research, we aim to compute abnormal pap smear prevalence as a way to raise awareness about the importance of early detection of pap smear changes and improve women's health clinic services.

In developing countries, cervical cancer is one of the major death causes in women [9]. "Cervical cancer is a major public health problem that continues to be one of the leading female genital cancers worldwide [12]." Cervical cancer ranks as seventh most common cancer among females in Saudi Arabia between age 15-44 years [16]. "Prevalence of abnormal pap smears is low, whereas advanced glandular abnormalities prevalence was observed to be high in central Saudi Arabia [14]."

Papanicolaou (Pap) smears is an effective screening tool for cervical premalignant and malignant conditions [9]. "Cancer of the cervix has been considered as one of the preventable cancers [15]." "Cervical carcinoma is an important women's health problem in the Western countries. There are only few published data on this disease in the Kingdom of Saudi Arabia (KSA) [18]."

A study was done in Department of Obstetrics and Gynaecology, Government Medical College, Patiala, Punjab, India showed mean age of the patients with invasive carcinoma was 57 years [9]. A study was done at King Abdulaziz Medical City showed abnormal pap smear prevalence was 4.3% which was found to be atypical epithelial cells abnormalities [14].

A study was done in Departments of Obstetrics and Gynecology, and Histopathology at the Maternity and Children Hospital (MCH), Madinah, KSA. "This study showed a relatively low prevalence of epithelial cell lesions, these lesions were mainly squamous cell lesions harbored by females who have an abnormal cervical appearance, and those with high parity who were lacking cervical screening program [13]."

"A study was done in Department of Obstetrics and Gynecology, Al Ahsa Maternity Hospital, Kingdom of Saudi Arabia showed: a relatively high prevalence of epithelial abnormalities in cervical smears in the studied population. The squamous cell carcinoma represented a higher than the overall prevalence compared to

World Health Organization (WHO) factsheets about Saudi Arabia [15]."

A study was done in Al-Baha region of KSA, showed that pap smear changes are less in Saudi women compared to western countries [20]. "This high prevalence of abnormal cervical cytology in subfertile Saudi women emphasizes the need for screening in patients whom are suitable for *in vitro* fertilization [16]."

"A study was done at Department of Pathology of King Abdulaziz Medical City, Jeddah, concluded that although this study showed a lower incidence and a wider age range of cervical epithelial cell abnormalities than others published internationally [17]."

At the King Abdul-Aziz University Hospital, Jeddah, KSA: "Cervical intraepithelial neoplasia and invasive cervical carcinoma are less common in KSA compared to the Western countries, however, cervical screening programs are necessary nationwide to estimate the actual magnitude of cervical carcinoma and its precursor lesions [18]."

"A Review of multicenter studies concluded that unified national programs for diagnosing cervical precancerous lesions should be established covering different region of the Kingdom to evaluate the magnitude of the problem [19]."

"Fewer women are screened for this disease in Al-Baha region of KSA, and health education is very important to encourage more Saudi female to have this important screening test particularly in this region of KSA [20]."

Materials and Methods

This study was carried out at Alwazart primary healthcare center in Riyadh, Saudi Arabia. Alwazarat PHC is one of 18 primary health care centers run by Prince Sultan Military Medical City (PSMMC) in Riyadh, Saudi Arabia. The target population was Saudi women visiting Alwazart PHC in Riyadh, Saudi Arabia.

In Alwazart PHC, pap smears are done with cyto-brush by a specialized women health physician and competent family physician in the well women clinic, then sent to PSMMC's pathology laboratory for analysis. All Pap smear screening results are documented on a medical computer system accessible by all PSMMC staff members. In this study, we gathered data from the past five years. Sample size calculator was used to determine sample size by using Al-Kadri et al. 2015 population proportion which was 4.3% and population size which was 5000 with 95% confidence level and 5% margin of error which resulted in 68 sample size. This means 68 or more measurements are needed to have a confidence level of 95% that the real value is within $\pm 5\%$ of the measured value. Pap smear reports were based on Bethesda classification. All women whose age above 21, and did pap smear test between July 2015 and July 2020 in Alwazart PHC were

included. Electronic medical records were reviewed thoroughly to fill the data form manually. Then data were analyzed using Statistical Package for Social Studies (SPSS). Data form include the following; patient MRN, age, marital status, educational level, number of children, when was the pap smear done, and results of pap smear. All types of pap smear results were included. The research ethics committee approval were obtained from Prince Sultan Military Medical City, Scientific Research Center. Patients' data was confidential and secured, as consent was inconvenient in this research as data was extracted from the medical computer system.

Results

A total number of 497 data were randomly selected out of the 1372 data set that were identified by inclusion criteria from the original set of 5008. Pap smear prevalence for atypical glandular cells and low grade squamous intraepithelial lesion was 1.4% (n=7/496), negative for intraepithelial lesion or malignancy 94.2% (n=467/497), and unsatisfactory for diagnostic evaluation 4.4% (n=22/497). Mean of age in this study group is 44.88 and the minimum age was 22, and the maximum age was 73, with standard deviation of 10.408 (Table 1). Atypical squamous cells of undetermined significance were more common in age group 21-40 years old, which the mean of age is 28. But low grade squamous interepithelial lesion were common in age group 31-50 years old, which the mean of age was 35 (Figure 1). Mean number of children was 5.12 which was the most common number of parity 13.4% (Figure 2). Atypical squamous cells of undetermined significance and low grade squamous interepithelial lesion was

related to less than 5 number of children; in atypical squamous cells of undetermined significance, number of children mean was 2.33; in low grade squamous interepithelial lesion, number of children mean was 4. (Figure 3). In Marital status out of 497 only 194 data was available, most of answered were married 98.5%, then widowed (1%), then divorced .5% (Figure 4). No data was found regarding income. All included data was for those who did pap smear so answer of data collecting sheet regarding did pap smear or not is 100% with standard deviation .000. Prevalence of pap smear done per year was as the following: 2015 (n=18/497) with a prevalence of 3.6%; 2016, (n=29/497) with a prevalence of 5.9%; 2017 (n=23/497) 4.9%; 2018 (n=51/497) 10.3%; 2019 (n=360/497) 72.7%; finally, 2020 (n=14/497) 2.8% (Figure 5).

Age	Statistics
N Valid	496
Missing	0
Mean	44.88
Median	45.50
Mode	47
Standard Deviation	10.408
Variance	108.318
Range	51

Table 1: Mean and standard deviation of age table.

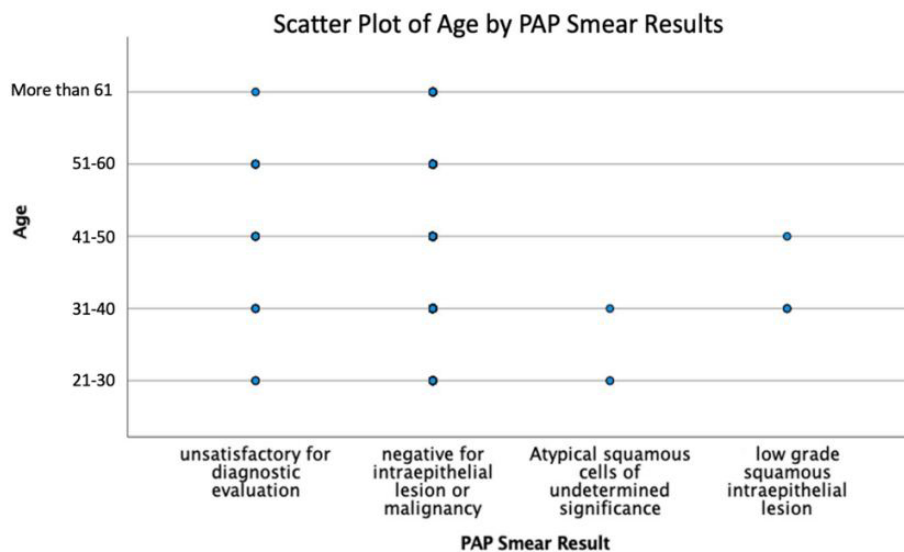


Figure 1: Age by pap smear results scatter plot.

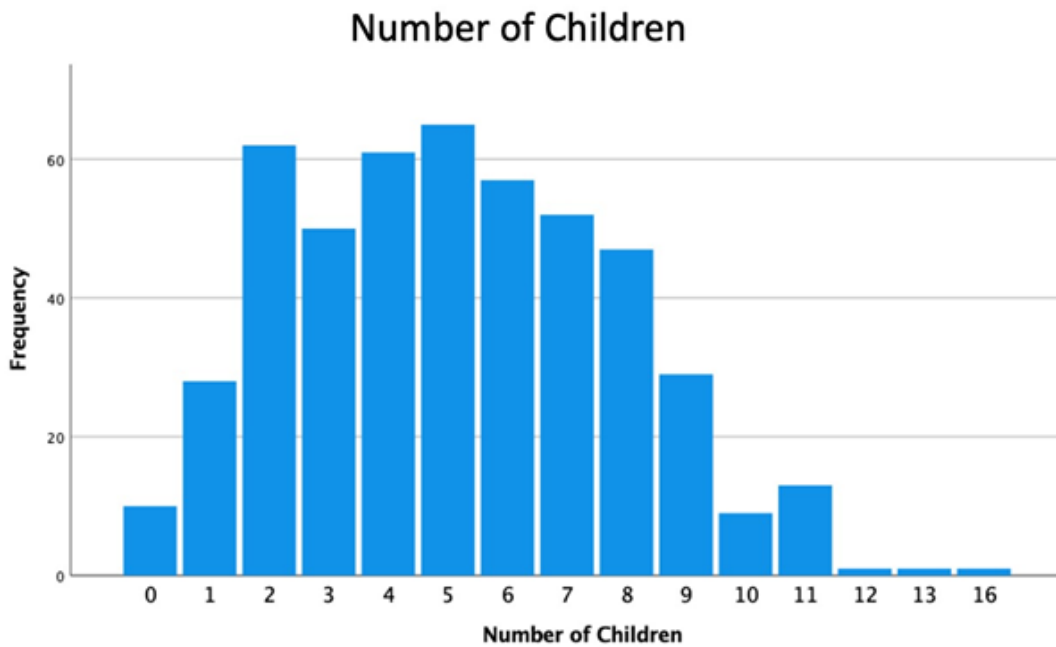


Figure 2: Mean number of children bar chart.

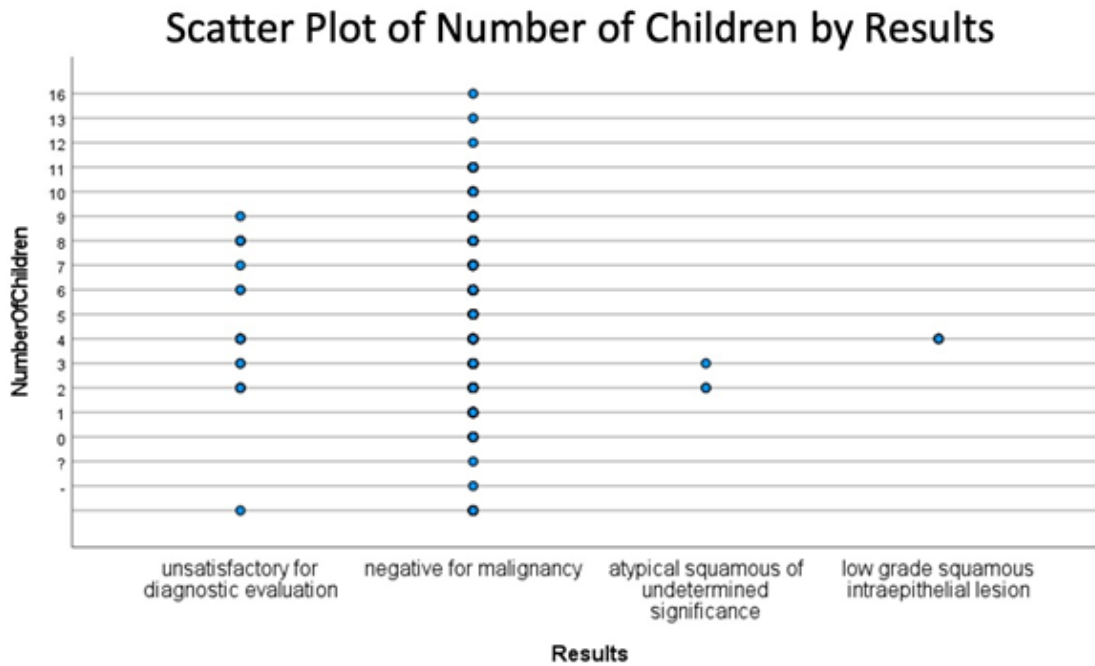


Figure 3: Number of children by results scatter plot.

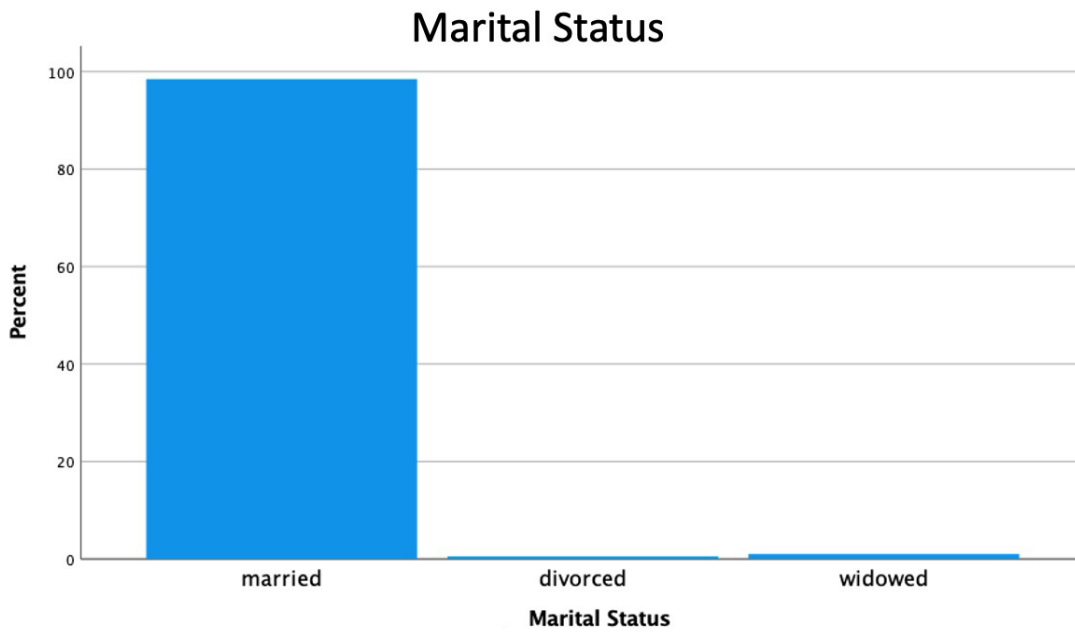


Figure 4: Marital status bar chart.

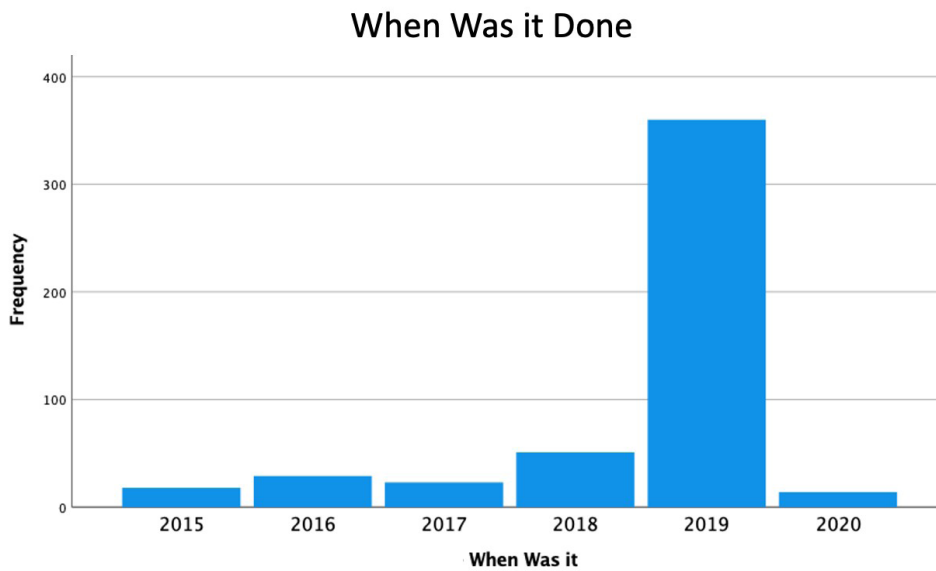


Figure 5: Prevalence of pap smear done per year bar chart.

Discussion

Saudi health sector is already making an impressive effort regarding preventive health care. All researches are supporting the evidence of how important is to do cervical cancer screening in order to achieve early detection and act according launched guidelines. Early detection by screening has shown significant reduction of invasive cervical cancer incidence. In our study, we focused on prevalence and pattern of pap smear changes in women who visits well women clinic in one of the main tertiary hospitals in Saudi Arabia which is PSMMC.

Comparing prevalence to other studies our study showed the least of cervical cell changes which is 1.4%. A study was done in Almadinah, KSA showed lowest rate of epithelial cell lesion prevalence in KSA, Gulf countries, and other countries, which was 2.4%, whereas our study showed much less prevalence [13]. Other studies prevalence were as the following, 4.3%, 4.95%, 29.5%, and, 5% [14-17]. In our study low parity was associated with atypical squamous cells of undetermined significance and low grade squamous. A study was done in Central Saudi Arabia showed the same results which was abnormal pap smear associated with lower parity [14]. However, a study was done in Madinah Region of Saudi Arabia, showed an opposite results, which is, abnormal pap smear was associated with higher parity [13]. Mean of age is 53 in women whose diagnosed with cervical cancer [4]. Comparing mean of age with other study which was done in King Abdul-Aziz University Hospital, Jeddah [18]. Atypical squamous cells of undetermined significance mean of age was 39 whereas in our study it was 28, mean of low grade squamous interepithelial lesion was 37 whereas in our study was 35.18 So, change in pattern of pap smear is starting earlier which indicated earlier screening. By comparing and analyzing other studies we conclude that secondary prevention of cervical cancer is evolving in Saudi Arabia, but yet, we should raise awareness regarding vaccination and proper screening.

Conclusion and Recommendation

We found in our study that pathological cervical cell changes start at earlier age in Saudi women than in other Saudi literatures, although the prevalence of abnormal cervical cell changes in Saudi Arabia is low, it is imperative to promote Pap smear screening earlier in life by raising awareness about its importance. Women should have access to screening and vaccination at all primary health care centers and hospitals. Pap smear screening can be motivated through multiple strategies, including continuing professional development for family physicians on the importance of early Pap smear screenings and vaccination against Human Papillomavirus, and motivating them to educate their patients. Waiting areas might be used to distribute messages to patients during waiting time. There are also opportunities to increase

awareness at malls by running community campaigns. The next step in research could include, for example, measuring the virulence of human papillomaviruses in Saudi Arabia and their most common genotypes.

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