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Utility of cervical pap smear study in cancer screening, to specify the strategy for cervical cancer control

Pathology

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ABSTRACT

Papanicolaou cytological (Pap) test is a tool for screening for cervicalcancer. In India, cancer cervix is the most common cancer among females.In India, cancer cervix is the most common cancer among females.Cervical intra-epithelial neoplasia (CIN) and cervical cancer remain important health problems for women worldwide. Awareness among public regarding the Pap test will detect precancerous changes in cervix before they progress to frank malignancy.This was a retrospective study of 1137 conventional cervical Pap smears reportedfrom the Department of Pathology, Hassan Institutional Medical Sciences, Hassan.The time period wasfrom July 2011 to September 2016.The smears werereported using The Bethesda system 2001. By our observations, we noted that Pap smearis a simple, cheap, safe and practical diagnostic tool for early detection of cervical cancer in highrisk group population and therefore should be established as routine screening procedure.

KEYWORDS:

Papanicolaou smear, Bathesda system, Cervical intraepithelial neoplasia, Cervical cancer,

Introduction:

Papanicolaou smear test is named after Dr. George Papanicolaou whointroduced it in 1941. It is most useful tool for detectionof abnormal cells that may be due to preneoplastic lesions or frankmalignancy. Cervical malignancy is one of the most preventable and curable of allcancers [1].Globally, 500,000 newcases of cervical cancer are diagnosed annually and 280,000 women die of thedisease[2].World-wide data shows that cervical cancer is thesecond most common cancer in women, comprising ofapproximately 12% of all cancers, and being the mostcommon in developing countries [3].The role of the Pap smear as a cancer screening tool forthe cervix has been substantiated by several studies in thelast 50 years [4]and the method has resulted in a decreasein the incidence and mortality rates of cervical cancer inthe developed world [5].Cervical cancer is the most common form ofcancer among Indian females. Usually 70% or more of these cases present in stage 3 or higherat the time of diagnosis [6]. It is estimated that inIndia 126,000 new cases of cervical canceroccur annually [7]. The mortality rate of cervical cancer can be significantlyreduced if a woman is screened once when she is betweenthe ages of 40-45 years [8].Currently Pap test has gained wide popularity not only as adiagnostic test in patients but also as an important routinescreening test in asymptomatic women due to its simplicity and cost effectiveness [9].Thereis a need for well-organized screening and educationalprograms for the control and prevention of cervical cancerin this country. Greater awareness amongclinicians regarding this test is required to carryout screening for cancer of cervix amongwomen in both rural and urban areas in India.The objective of this study was to determinethe prevalence of abnormal cervical epithelial lesions.

Materials and Methods:

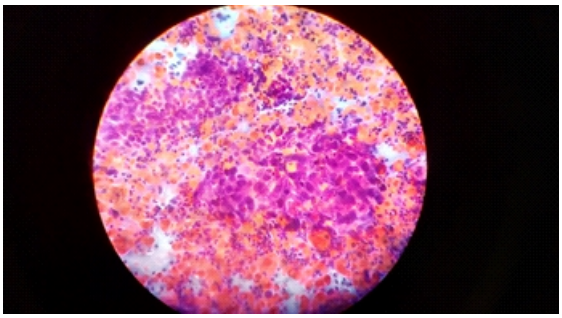
This was a retrospective study of all cervical Pap smearcases reported from the Department of Pathology, Hassan Institutional Medical Sciences, a teaching hospital from Hassan.The time period wasfrom July 2011 to September 2016. The relevant clinical data were collected by gynecologists,including the day of menstrual cycle, age of patients, parity,presenting symptoms etc.Those who presented withexcessive white discharge per vaginum, bleedingper vaginum, irregular menstruation, pelvic painand dyspareruniа were considered assymptomatic.The age of thescreened patients was in the range of 25-65 years.Cervical smears were collected by gynecologist with spatula.Bothectocervix and endocervix were sampled. Slideswere prepared, labeled, fixed in 95% ethylalcohol immediately and subsequently stainedby Pap stain. After staining, slides weremounted with DPX (distrene dibutyl phthalatexylene), screened.Findings were recorded and classified according tothe 2001 Bethesda System reporting Pap smear cytology.The epithelial cell abnormalities particularly the squamous epithelial abnormalityhas been categorized into atypical squamouscells (ASC) including ASC of undetermined significance (ASC-US), ASC, cannotexclude high grade squamous intraepitheliallesions (ASC-H) and squamous intraepitheliallesion (SIL). SIL was again subdivided into lowgradesquamous intraepithelial lesion (LSIL)and high-grade squamous intraepithelial lesion(HSIL). Frank invasive malignancy was termedas squamous cell carcinoma. Similarly, glandularcell abnormalities were categorized into atypicalendocervical cells not otherwise specified,atypical endometrial cell not otherwise specifiedand atypical glandular cell not otherwisespecified. Those with LSIL and HSIL werecounselled and were advised to undergocolposcopic examination and biopsy forhistopathological examination.

RESULTS

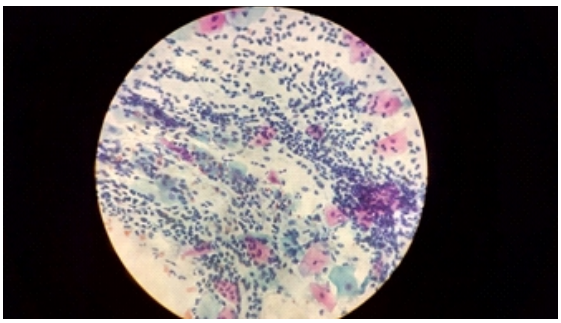
Total number of Pap smear study during the period of July 2011 to September 2016 were1137. Maximum number of patients 492 cases (42.4%) were in the age group of 31-40 years (fourth decade) followed by 424 cases (36.8%) in third, 203 cases (19.4%) in fifth, 10 cases (0.9%) in sixth decade and 08 cases (0.7%) in seventh decade . The most common presenting complaint was discharge per vaginum present in 653 cases (57.4%) patients. History of pain in the lower abdomen was present in 241 cases (21.2%), inter menstrual bleeding in 111 cases (9.8%), and 84 cases (7.4%) patients had complaint of dyspareunia. Post-coital bleeding was the chief complaint in 36 cases (3.2%) patients. Only twelve patients (1%) presented with post-menopausal bleeding.

Seventeen cases (1.49%) were positive for malignancy (Fig 01), 140 cases (12.31%) were negative for malignancy. Out of the 140 smears negativefor any intra epithelial lesion or malignancy, 80 (7.03%) showed normal cytological findings and 752 cases (66.14%) were inflammatory (Fig 02). Diagnosis of atypical squamous cells of undetermined significance (ASCUS) was made in 34 cases(3.0%). Squamous intraepithelial lesion was seen in 85 (7.47%) patients, out of which, 56(4.92%) had low grade squamous intraepithelial lesion (LSIL) (Fig 03). In 29 cases (2.55%) of high grade squamous intraepithelial lesion (HSIL) (Fig 04), the smears showed severely dyskaryotic cells with irregular hyperchromatic nuclei with coarsely clumped chromatin. Seventeen(1.49%) smears showed squamous cell carcinoma features.

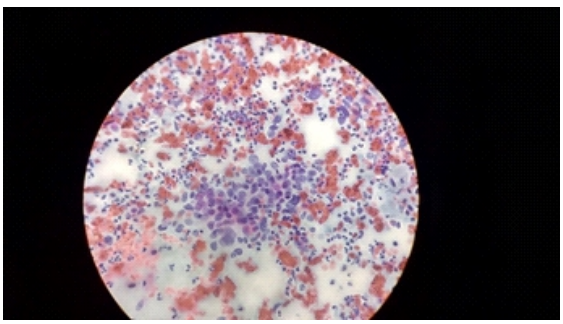
Mean age of cases with low grade squamous intraepithelial lesion (LSIL) was 34.2 years and those with HSIL and invasive carcinoma were 41.4 years and 58 years, respectively. There was sequential progression in the development of LSIL to HSIL to invasive carcinoma with advancing age. The most common presenting complaint associated with SIL and carcinoma was vaginal discharge (78.4%) followed by post menopausal bleeding (12.4%). Most common clinical lesion seen in patients with SIL and carcinoma was erosion (39.2%) followed by cervix bleeding on touch (21.4%). The average age of patients for all the epithelial abnormalities was 46 years.



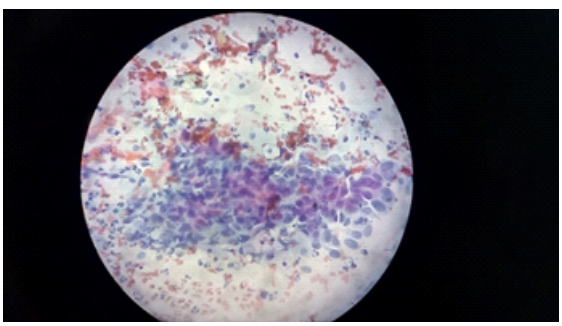
(Fig 01) Cytomorphological features displaying features of carcinoma of cervix



(Fig 02) Cytomorphological features displaying features of nonspecific inflammation



(Fig 03) Cytomorphological features displaying features of LSIL.



(Fig 04) Cytomorphological features displaying features of HSIL.

Discussion:

With the changes in the life styles and demographic profiles in developing countries, non-communicable diseases are emerging as an important health problem which demand appropriate control program before they assume epidemic propagation [10]. Cancer has been a major cause of morbidity and mortality. According to National Cancer Registry Program of India, cancers of uterine cervix and breast are the leading malignancies seen in females of India [11]. There should be an effective mass screening program aimed at specific age group for detecting precancerous condition before they progress to invasive cancers [12]. In India incidence rates of cancer of the cervix is very high especially in rural areas [6]. The age- standardized incidence rates have ranged from 16-55 per 100,000 women in different regionsof India. Although control of cervical cancer by early detection and treatment remains a priority of the National Cancer Control Programme of India, organized cytology screening programmes are definitely lacking. One possible reason is the technical and financial constraints to organize cytology screening [7]. Therefore the Pap test is designatedas the "single best cancer screening procedure".[13] Introduction of conventional Pap screening services reduces cervical cancer rates by 60% to 90% within 3 years of implementation; andthese reductions in incidence and mortality are consistent.The past failures of cervical screening in developing countries are attributable to failures in programme quality rather than to technological limitations of the screening test [14]. In fact successful implementation of Pap test screening in southern Vietnam, which recorded reductions in cervical cancer incidence from 29.2 per 100,000 in 1998 to 16 per 100,000 in 2003 reiterates these view [15]. A study from neighbouring Bangladeshshowed a higher prevalence (8.2%) of epithelial cell abnormalityin the Pap smear in contrast to other studies [16].

There are various screening test for cervical cancer like Pap smear, liquid Pap cytology, automated cervical screening techniques, visual inspection of cervix after Lugol's Iodine and acetic acid application, speculoscopy, cervicography. Out of all these, exfoliative cytology has been regarded as the gold standard for cervical screening programs [17]. The role of HPV in development of cervical cancer is proved beyond doubt. If Pap screening is associated with HPV-DNA testing than we can increase the sensitivity. World Health Organization (1992) recommended screening every woman once in her lifetime at 40 years [18].

In countries like India with predominant rural population is having low socio-economic status, marriage at an early age and poor medical facility, Pap smear examination is widely accepted screening method [19]. It is also important to set clear and realistic long term goals and to formulate a uterine cervical screening program that is easily available, within existing resources, to a large section of society[20].

Cancer cervix is considered to be an ideal gynaecological malignancy for screening as it meets both test and disease criteria. It has a long latent phase during which it can be detected as identifiable and treatable premalignant lesions which precede the invasive disease and the benefit of conducting screening for carcinoma cervix exceeds the cost involve [21]. The incidence of cervical cancer has decreased more than 50% in the past 30 years because of widespread screening with cervical cytology. In 1975, the rate was 14.8 per 100,000 women in the United States and by 2006, it had been reduced to 6.5 per 100,000 women. Mortality from the disease has undergone a similar decrease [22].

More education programs should be created to increase the awareness of the benefit of cervical Pap smears.In our study, mean age of patients with LSIL was 34.2 years, and those with HSIL and invasive carcinoma were 41.4 years and 58 years, respectively. Elhakeemet al.,[23] also recorded a progressive increase in development of LSIL to invasive carcinoma with increasing age. LSIL had peak between 20-29 years, HSIL between 30-39 years and invasive carcinoma had peak incidence in age group of 50-59 years. Afrakhtehet al.,[24] found mean age of patients with LSIL, HSIL and invasive cancer to be 37.7, 41.7 and 54.5 years, respectively. The results are in concordance with present study.Present study emphasized the significance of vaginal discharge and its association with neoplastic changes in the cervix. The results correspond with many previous studies [25].

In present studies, prevalence of ASCUS was 34 cases (3.0%).SIL was seen in 85 cases (7.47%), out of which LSIL was 56 cases(4.92%) and HSIL accounted for 29 cases (2.55%). Invasive cancer was seen in 17(1.49%) cases. The results are comparable to those obtained by Patel et al.,[28] and Anuradha and Sinha.[26] Few studies[27] have documented a lower prevalence rate for SIL and invasive carcinoma. Possible cause for difference is that we screened only symptomatic women and thus more chances of positive results.

Conclusion:

Cervical cytology by Pap smear is a simple, safe and effective screening tool to detect premalignant and malignant lesions of cervix at an early stage, and thus help the clinicians in early and more efficient management of the patients.Based on the findings of this study we recommendat least a single life-time Pap screening cytology of theuterine cervix of all the women aged 40 to 50 years.We can develop a cost effective screening method by training medical and paramedical staff at primary health centre level. PAP smear examination should begin at 30 years.It should be subsequently followed with HPV-DNA testing at higher centres. We conclude that regular counselling and screening should be conducted among vulnerable age groups. Better awareness also should be created with the co-operation of media, non-government organizations, government and above all with the active participation of the people concerned to treat this cancer which can be detected at an early stage.

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