Research Article

Expanding Horizon of Cervical Cancer Screening by Involving Antenatal Patients

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Abstract

Objective: *To study the risk factors, types, incidence and prevalence of cervical cytopathological features that may be present in pregnant women on Pap Smear and expand cervical screening through Pap smear in pregnant females.*

Materials and Methods: *Three hundred antenatal women attending the antenatal outpatient department were subjected to a Pap smear. History was taken and survey conducted as per a proforma in order to obtain data regarding participants' socio-demographic characteristics, gynecological, obstetrical history, habits, and their knowledge, if any, of pap tests and cervical cancer.*

Results: *There were 168 abnormal Pap smears in this study out of the 300 taken and analyzed. The prevalence of abnormal smears was 56%. The abnormal smears included inflammation (50.67%), monilial pathology (3.33%), trichomonas infection (2%). No epithelial cell abnormality, such as ASCUS, LSIL or HSIL, was seen.*

Conclusions: *A significant number of pregnant women have abnormal smears. A screening programme during pregnancy may be ideally be suited to the population type as in India, as antenatal visits are often the first point of contact with a gynaecologist in developing countries.*

Keywords: *Pap Smear, cervical cancer, antenatal, pregnancy, cervical screening.*

Introduction

Cervical cancer is one of the most common malignant pathologies in females. Every year, more than 493,000 women are diagnosed, and 274,000 die from cervical cancer worldwide.[1] In India, cervical cancer ranks first among all female cancer types.[2] The peak age of incidence of precancerous lesions of the cervix is in the age range 25–35, and thus, antenatal subjects present an opportunity to offer a Pap smear to women who otherwise might not report for screening.[3,4] Cervical cytological abnormalities are found in up to 5% of all pregnancies.[5,6] The majority of these cases are in developing countries. In most

Western countries, cytological screening is a standard part of antenatal protocols, but no such screening programme exists in India. The incidence of invasive carcinoma ranges between 1-10/10,000 pregnancies.[6] The population at risk for the development of cervical cancer in India is 365.71 million women above the age of 15. Estimates indicate there are approximately 132,000 newly diagnosed cases each year and 74,000 deaths annually, nearly 1/3rd of the global cervical cancer deaths.[7] Indian women face a 2.5% cumulative lifetime risk and 1.4% cumulative death risk from cervical cancer.[7] Cervical cancer in India accounts for ~20 per cent of all cancer related deaths in women and is the number one cause of death in middle aged women.

Reproductive health is often related to sexual behavior, therefore embarrassment, lack of information and accurate knowledge are barriers to utilization of screening by Pap smears.[8] Age and level of education, in particular, influence the perception of Pap smears screening.[9] Lack of education and adolescence together magnify the fears and misconceptions women have about the procedure and purpose of Pap smears.[10,11] There is anxiety and hesitation at initiating conversations about genital health.

Prenatal visits are an ideal time for initiating screening for cervical cancer in developing countries. One in every hundred cervical cancer patients are pregnant when diagnosed.[12] Women are likely to avail antenatal care services, thus making it an opportune time to perform cervical screening. Antenatal visits are also convenient for informing the target population about the risks of cervical cancer and the benefits of screening. Therefore, it may be possible to decrease cervical cancer incidence and mortality through strategies that target pregnant women.

Materials and Methods

The study consisted of hundreds of antenatal women, irrespective of age, parity and gestational age, attending the antenatal outpatient department at SGRDIMSR. Only those subjects who had history of at least 7 days of abstinence, no use of vaginal ovule, and no vaginal lavage in the last 48 hours were subjected to a Pap Smear examination. If these conditions were not met, they were asked to return after a week's time. History was taken and survey conducted as per the proforma prepared in order to obtain data regarding participants' socio-demographic characteristics, gynecological, obstetrical history, habits, and their knowledge, if any, of pap tests and cervical cancer. Lastly, informed consent was obtained for the conduction of the test. The subjects were excluded if there was unexplained vaginal bleeding, established labor, premature rupture of membranes, greater than 36 weeks gestation and if findings showed frank carcinoma cervix.

Papanicolaou smear was done with Ayre's spatula. In good illumination with the patient in dorsal position, Cusco's speculum was gently inserted to visualise vaginal walls and fix the cervix. First inspection of the cervix was done and any of the findings, especially type of discharge, were noted. Ayre's spatula was softly inserted and placed at the cervical os, with the larger protruding part of the spatula in the cervical canal and the small resting on the ectocervix. A rotation of 360 degrees with adequate force, not too much to cause bleeding, was done while maintaining contact with ectocervix. Both sides of the spatula were smeared on the slides and fixed. Fixation was done immediately to avoid air drying. All smears were immediately sent to the department of Pathology of SGRDIMSR.

The results of Pap smear were analysed according to Bethesda classification 2001. The patients with infectious and inflammatory smears were managed medically with aid of vaginal tablets and were counselled on local hygiene of vaginal area. However, in the population studied no epithelial cell abnormality, such as, ASCUS, LSIL or HSIL was encountered, so no therapeutic procedures were required.

Results

Three hundred Pap Smears were done on women meeting the criteria for study. 168 smears were abnormal on examination. 152 (50.67%) of these showed inflammatory cytology, while 10 (3.33%) had Monilial and 6 (2%) Trichomonal pathology (Table 1). No epithelial cell abnormality, such as, ASCUS, LSIL or HSIL was seen.

The mean age for abnormal Pap smears is 25.86±3.52 years. The maximum abnormal Pap smears were seen in those 25 year or younger, which accounted for 91 (54.17%) of Pap smears, followed by 58 (34.52%) abnormal smears in the 26-30 year age group. Primigravidas had 68 (40.47%) abnormal smears and 100 (59.52%) abnormal smears were in multigravidas (Table 2).

There were 104 (61.90%) abnormal smears in those 21 years or younger at first intercourse as compared to 64 (38.10%) in those over 21 years of age at time of sexual debut (Table 3).

One hundred and fifty five (92.26%) abnormal smears were present in those with one sexual partner as compared to 13 (7.73%) abnormal smears in those with more than one partner (Table 4). In addition, 151 (89.88%) abnormal smears were seen in those with husband with one sexual partner and 17 (10.11%) abnormal smears in those with husband having more than one sexual partner (Table 5). Increasing number of sexual partners of the women and their husbands were both associated with abnormal smears.

Smokers were much more likely to have abnormal smears, in non-smokers and 28 of 29 in smokers. There was a significant association between smoking and abnormal smears (Table 6).

There were 7 (4.17%) abnormal Pap smears in those with history of use of oral contraceptives (OCP), 9 (5.36%) abnormal smears in those using condoms and 9 (5.36%) abnormal smears in those with history of copper T use (Table 7).

Rural residence was associated with abnormal smears. 118 (70.23%) abnormal Pap smears were in those with a rural background. Those with urban background had 50 (29.76%) abnormal smears. Whereas, 110 (83.33%) normal Pap smears were from rural residence and 22 (16.67%) of normal Pap smears were from urban residence (Table 8).

Per speculum finding of unhealthy cervix were present in 35 women and 31 (18.45%) of these had abnormal smears. 128 (96.97%) of 265 with healthy cervix had normal smears. Only 4 (3.03%) with an unhealthy cervix had a normal smear. Unhealthy cervix on per speculum examination was associated with abnormal cervical smears (Table 9).

The questionnaire was graded from 0-8, with 0-4 regarded as having little to no knowledge and those with scores from 5-8 regarded as having adequate knowledge about carcinoma cervix and utility of Pap smears. Out 300 patients only 9 patients had a score between 5-8. There were 165 (98.21%) abnormal smears in those with a score between 0-5 and 3 (1.78%) abnormal smears with those scoring between 5-8 (Table 10).

Table 1 Distribution of smears according to Cytology. (n=300)

Percentage	No.	PAP smears
44.00	132	Normal
50.67	152	Inflammatory
3.33	10	Monilial
2	6	Trichomonas

Table 2 Distribution of smears in relation to age (years)

Abnormal (n=168)		Normal (n=132)		Age Group
Percentage	No.	Percentage	No.	
54.17	91	53.79	71	18 – 25
34.52	58	34.85	46	26 – 30
8.33	14	9.85	13	31 – 35
2.98	5	1.52	2	36 – 40

Mean age (normal) = 26.11 ±3.93
Mean age (abnormal) = 25.86 ±3.92

Table 3 Distribution of smears in relation to age at First Intercourse (years)

Abnormal (n=168)		Normal (n=132)		Age at intercourse
Percentage	No.	Percentage	No.	
61.90	104	69.70	92	≥21
38.10	64	30.30	40	<21

Table 4 Distribution of smears according to number of Sexual Partners of woman

Abnormal (n=168)		Normal (n=132)		No. of sexual partners
Percentage	No.	Percentage	No.	
92.26	155	99.24	131	1
7.73	13	0.76	1	> 1
6.60				X^2
0.010[*]				P value

[*]P value <0.05 significant, [**]p value <0.001 highly significant

Table 5 Distribution of smears according to Husband's Partners

Abnormal (n=168)		Normal (n=132)		No. of sexual partners
Percentage	No.	Percentage	No.	
89.88	151	100.00	132	1
10.11	17	0.00	0	> 1
12.33				X^2
0.0004[**]				P value

[*]P value <0.05 significant, [**]p value <0.001 highly significant

Table 6 Distribution of smears in Smokers

Abnormal (n=168)		Normal (n=132)		Smoking
Percentage	No.	Percentage	No.	
83.33	140	99.24	131	No
16.66	28	0.76	1	Yes
19.64				X^2
0.0009[**]				P value

[*]P value <0.05 significant, [**]p value <0.001 highly significant

Table 7 Distribution according to type of Contraceptive

Abnormal (n=168)		Normal (n=132)		Contraception
Percentage	No.	Percentage	No.	
4.17	7	3.79	5	OCP
5.36	9	11.36	15	Condom
5.36	9	0.00	0	CuT

Table 8 Distribution of smears according to Geographical Residence

Abnormal (n=168)		Normal (n=132)		Area
Percentage	No.	Percentage	No.	
70.23	118	83.33	110	Rural
29.76	50	16.67	22	Urban
6.25				X^2
0.012[*]				P value

[*]P value <0.05 significant, [**]p value <0.001 highly significant

Table 9 Distribution of smears according to Per Speculum findings

Abnormal (n=168)		Normal (n=132)		Per Speculum
Percentage	No.	Percentage	No.	
81.55	137	96.97	128	Healthy
18.45	31	3.03	4	Unhealthy
15.60				X^2
0.0007[**]				P value

[*]P value <0.05 significant, [**]p value <0.001 highly significant

Table 10 Distribution according to awareness Questionnaire regarding Pap smear and Carcinoma Cervix

Abnormal (n=168)		Normal (n=132)		Questionnaire
Percentage	No.	Percentage	No.	
98.21	165	95.45	126	0 – 4
1.78	3	4.54	6	5 – 8

Discussion

Pap smear examination is a useful tool to diagnose premalignant lesions of the cervix and various infectious pathologies. The diagnosis of candida, trichomonas, herpes simplex virus, and human papilloma virus can be reliably diagnosed on Pap smears on the basis of specific criteria.[13] Inflammation itself is not necessarily indicative of infection, and an inflammatory changes are commonly seen on Pap smears from pregnant women.[14,15] Although, Bedrossian et al. found inflammatory cells covering more than 50% of smear, on Pap smears in pregnant women to be at high risk for sexually transmitted diseases and pregnancy-related complications.[16]

In this study, prevalence of abnormal smears was correlated with the risk factors including age, parity, residence area, gestational age, gravidity, socio-economic status, occupation, age at first intercourse, number of sexual partners, smoking, history of contraception.

There were 152 (50.67%) abnormal smears including inflammatory smears, whose significance has been a matter of much interest in relation to pregnancy complications and is being currently studied. 10 (3.33%) smears were suggestive of fungal infection and 6 (2%) showed trichomonas infection (Table 1). However, in the population studied no epithelial cell abnormality such as ASCUS, LSIL or HSIL was present. These results were in accordance with Ngaojaruwong N et al., who reported the prevalence of abnormal smears at 38% in their study, which included smears indicative of candida infections (23.4%), bacterial vaginosis (14%), trichomonas infection (0.2%) and LSIL (0.4%).[17]

The mean age of the patients with abnormal smears was 25.86±3.92 years. The maximum abnormal pap smears were seen in age group of 18-25 years which accounted for 54.17% of the abnormal smears, followed by 26-30 year age group with 34.52% of the abnormal smears, 31-35 year age group with 8.33% abnormal smears and lastly, 35 or older age group had 2.98% abnormal smears. The difference between the ages of women in the normal and abnormal smear group was not statistically significant (Table 2). Seda J et al, reported a similar prevalence of abnormal smears in the 20-24 year age group.[18]

The study found no association between gravidity and abnormal smears. 40.47 % patients with abnormal smears were primigravida and 59.52 % were multigravida. This is also in contrast with work done by Seda J et al., and Ozgun G et al., who reported high gravidity as a risk factor for having a lesion in the uterine cervix.[18,19]

This study did not find an association between age at first intercourse and abnormal smears (Table 3). 61.90% of the abnormal smears were in those 21 years or older at first intercourse, compared to 38.10% abnormal smears in those 21 or younger. In contrast, Ngaojaruwong N et al., and Seda J et al., found a significant relation between abnormal smears in pregnant women and early age at first intercourse.[17,18]

Multiple sexual partners, both of the women or their husbands were significantly associated with abnormal smears (Table 4 and 5). 14 women had more than one sexual partner and only 1 of them had a normal smear. Similarly, 100% of the women with normal smears had a husband with one sexual partner while, all 17 women with husband with more than one partner had abnormal smears. Remschmidt C et al, also noted the significance of multiple sexual partners and cervical lesions.[20] Ngaojaruwong N et al.,

considered husbands with multiple sexual partners as the main risk factor for abnormal smears.[17]

The relationship between smokers and abnormal smears was significant (Table 6). Only one smoker had normal smear, 28 of the 29 smears of smokers were abnormal. Daly et al. discovered the correlation between number of cigarettes smoked and abnormal cervical smears.[21] The mechanism may be that smoking decreasing immune resistance and the ability of the immune system to clear the body of infections.

The number of patients with abnormal Pap smear who used condoms as a contraceptive measure was 5.36%, while 4.17% used oral contraceptive pills (OCP), and 5.36% used copper T. OCP intake was not associated with increased risk of abnormal smears in this study (Table 7). Ajah LO et al., also noted no association between cervical neoplasia and hormonal contraceptives.[22] Both studies contradict much of literature which shows a significant relation between OCP use and cervical neoplasia.

Abnormal smears were associated with rural residence (Table 8). 70.23% patients with abnormal smears had a rural residence as compared to 29.76% abnormal smears which belonged to patients from urban area. This was in accordance with the study by Ajah LO et al., who proposed rural dwellers as a risk factor for cervical neoplasia.[22]

An unhealthy cervix per speculum is highly suggestive of cervical pathology and is an independent risk factor for an abnormal Pap smear (Table 9). 128 (96.97%) with healthy cervix had normal smears, while only 4 (3.03%) out of 35 participants with an unhealthy cervix had a normal smear.

A questionnaire was provided to the participants on knowledge of carcinoma cervix and its prevention by regular Pap Smear screening. The answers were scored on a scale from 0-8 and divided into two groups. Group one with a score of 0-4 were judged to have little to no awareness of preventive measures, while group two scored from 5-8 had adequate knowledge of screening and cervical cancer. Only 9 patients out of 300 scored between 5-8, 291 had a score of 0-4 (Table 10). The emphasis on a need to educate the general population about the prevention of cervical cancer and the utility and ease of Pap smear screening cannot be overstated.

Socioeconomic status and gestational age had no link to abnormal smears in this study.

Conclusion

A significant number of pregnant women have abnormal smears. The study showed a significant association between abnormal Pap Smears and the number of sexual partner of women and their husbands, smoking, urban residence and unhealthy cervix on per speculum examination. The questionnaire showed a near absolute lack of knowledge of cervical carcinoma or its prevention.

Screening programme during pregnancy may be ideally suited to the population in India, as antenatal visits are often the first point of contact with a gynaecologist. This opportunity for screening and counselling should not be missed. India suffers an undue burden from cervical neoplasia and great efforts must be made to decrease the morbidity and mortality from this preventable disease. Education and counselling are essential to make the population more aware of the utility of cervical smears. We recommend Pap Smear screening in all antenatal women as part of a routine screening program.

Declarations

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