

A Prospective Analytical Study of Cervical Cytology in Pregnant Women Attending a Tertiary Hospital in Pondicherry

Prathusha.K.

Received: 15 December 2019 Accepted: 4 January 2020 Published: 15 January 2020

Abstract

Background: This study was done to analyse the cervical cytological changes in pregnant women, to screen and down stage cervical cancer, to identify and treat cervical infections and to create awareness about the need for regular screening. Methods: A prospective analytical study was conducted on 500 pregnant women during their first antenatal visit irrespective of gestational age after taking informed consent. Pap smears were taken, stained and interpreted according to Bethesda-III system (2001). Results: Mean age of the patients was 25.98 ± 3.56 years.

Index terms— cervical cytology, cervical cancer, Papanicolaou smear, cancer screening, epithelial cell abnormality.

1 Introduction

n women aged 21 to 35 years, pregnancy provides a window of opportunity to screen the cervix for neoplastic as well as infectious diseases and create awareness in women about the need for regular screening. Carcinoma of the cervix is the most common malignancy among Indian women between 15-44 years of age. 1 The crude incidence rate for cervical cancer is 23.5 per 1,00,000 population. About 30% of cervical cancers are diagnosed during the reproductive years and 3% of cervical cancers are diagnosed during pregnancy. 2 The incidence of abnormal Pap smear is reported to be 5-8% and 1.2% of these patients end up having cervical cancer during pregnancy. 3 The Pap smear is most successful screening test for carcinoma cervix. It is also used to detect inflammation and infections in asymptomatic women. Early diagnosis and treatment of such infections results in prevention of premature rupture of membranes, premature birth, chorioamnionitis etc.

This study was conducted to analyse cervical smear abnormalities in pregnant women attending the antenatal clinic of our hospital.

2 II.

3 Methodology

A prospective analytical study was conducted in 500 pregnant women attending the antenatal OPD at a District Hospital in the Department of Obstetrics and Gynecology in Puducherry for a period of one year fulfilling the inclusion criteria, after obtaining written, informed and valid consent. a) Inclusion Criteria 1. Pregnant women presenting for the first antenatal visit. 2. Aged between 21-35 years.

The study was done after obtaining the clearance from the institutional ethical committee.

4 b) Exclusion Criteria

Pregnant women presenting with 1. Threatened abortion. 2. Vaginal bleeding due to any other cause. 3. Not consenting to be a part of the study.

Pap smear with cotton tipped swab was taken, conventional smears were made and fixed in 95% alcohol, dried, stained and interpreted according to Bethesda-III system (2001).

In patients where the Pap smear was satisfactory with normal findings, a routine screening was advised postnatally.

Patients with unsatisfactory Pap smear, a repeat Pap was taken after 8 weeks.

Patients whose Pap smear showed infections, were treated with appropriate antibiotics and again it was repeated after 6 weeks.

Pap smear which showed abnormal cytology or premalignant lesions, were followed up with repeat cytology, colposcopy or biopsy.

5 c) Statistical Analysis

The data obtained from the study was analysed using SPSS 15.0 software. Results on continuous measurements were presented on Mean SD(Min-Max) and results on categorical measurements were presented in Number(%). Chi-square/Fisher Exact test was used to find the significance of study parameters on categorical scale between two or more groups. A P value <0.05 was considered to be significant. 62.8% of the study population belonged to socioeconomic class IV.(Figure 1). The mean age at marriage was 22.66 ± 3.24 y, 27.6%(138) were married and 9.2%(46) had their first child at or before 20 years of age. (Table 2, 3) Knowledge regarding Pap smear was very poor as out of 500, only 0.6% (3) patients had undergone a Pap smear in the past, while just 5.2% patients had previously heard of a Pap smear test. (Figure 4) ??? 00 (00) 00 (??)

6 III.

7 Results

1 (100) 1 (0.2)

Out of the 240 primigravida patients, only one patient had used any method of contraception i.e condom whereas out of 169 second gravidas, 25.4%(43) used Cu T and 0.6%(1) used condom and OC Pills each respectively. (Table 4) Of the 462 patients who had healthy cervix, Pap smear revealed that, infection was noted in 11.6%(55) patients where as inflammation and epithelial cell abnormality in 54.1%(250) and 0.2% (1).

Out of the 38 patients with unhealthy cervix, Hypertrophy was seen in 0.2% (1), Polyp in 0.4%(2), growth in 0.4%(2), cervical ectropion in 6.6%(33) and their pap smear showed inflammation in 78.8%(26), infection in 6.1%(2). Among the growth, 1 Papsmear showed inflammation while other was reported as HSIL. (Table6) 449 patients were asymptomatic and clinically no discharge was documented but 5.4%(24) of these had infection on Pap smear which were treated. 10.2%(51) patients were asymptomatic and clinical examination revealed Discharge. Infection in both the groups were treated and repeat Papsmear was negative.(Table7) Overall Pap smear revealed Inflammation in 55.6%, Infections such as Candidiasis in 2%, Bacterial vaginosis in 4% and Trichomoniasis in 5.6%. Epithelial cell abnormality was reported in 0.4%(2) cases i.e, Atypical squamous cells of undetermined significance(ASCUS) (Figure6) and High grade squamous intra epithelial lesion (HSIL) (Figure7). (Table8). create awareness regarding Carcinoma cervix and the need for regular Pap smears so that carcinoma cervix can be down staged and infections if any can be treated early preventing its associated maternal and foetal complications.

In the present study, the mean age of the patient was 25.98 years with a standard deviation of It is observed that there is significant increase in frequency and grade of cytological change with increasing parity due to cervical trauma, hormonal and the present study, 55% patients were nulliparous while 35.2% were second gravidas, having one full term delivery which may be the reason for lower rate of abnormal smears, similar to the study by Singh P et al. 5 It was seen that, 37% belonged to first trimester, 58.2% belonged to second trimester and 4.8% belonged to third trimester at the time of examination out of which the 2 atypical cytological reports obtained were in second trimester similar to the study by Jones et al 13 This emphasizes on the need of education and awareness in patients regarding cervical cytological screening in early pregnancy similar to the study by Jones et al. 13 Poor use and awareness of contraceptive practices was observed in our study as 87.8% of study population did not use any kind of contraception and was significantly associated with abnormal cervical cytology ($P < 0.001$) in accordance to the study conducted by C.Kurian et al where 84% patients did not use any method of contraception while 11% used condoms, 4% used Cu-T and 1% used oral contraceptive pills. 8 Our study in accordance with other studies conducted in India Hande CM et al and C Kurien et al also showed very poor awareness and knowledge about of Pap smear, female health negligence as well as inadequate use of health resources in our country.5.2% of study population had heard of Pap smear test and only 0.6% had previously undergone a Pap smear test 15,8 (Table 10) while a study conducted in Vietnam by Nguyen et al 14 identified that 74% had heard of the test, and 76% had undergone a smear test. 14 Though in the study population it was seen that there was a trend of early marriage($27.6\% < 20$ years vs $55.4\% < 25$ years) there was a low incidence of cervical cancer, In a number of case control studies the risk of cervical cancer was found to be inversely related to age at 1st sexual intercourse, with approximately 2 fold differentials between those with consummation before 16 years of age and those having it after 20 years of age. 9 The mean age at marriage was 22.66 ± 3.24 yrs in the present study. Thus the low incidence of cervical cancer in present population could be due to no promiscuity and delay in consummation of sexual activity.

In the present study, only (9.2%)46 patients had their first child below the age of 20 years indicating low incidence of early sexual activities, one of the main predisposing factor for abnormal cervical cytology. Sexual behavioural characteristics were considered independent risk factors for precancer and invasive cancer in Indian women in the study by Cuziks et al and Juneja et al. 10,11 nutritional changes during pregnancy and labour. 12

In During pregnancy, as transformation zone is better exposed due to physiological eversion of cervix, cervical sampling becomes easier which is evident in the present study in which 99% patients had satisfactory Pap smear in accordance to the study carried out by C.Kurian et al. 8 At times, patient may have asymptomatic vaginal discharge. In the present study, asymptomatic Present study had a lower incidence of abnormal cytological smears (0.4%). This may be because of limited number of patients studied.(Table 11) In the present study, patients whose smears showed infections were treated with appropriate antibiotics. After 6 weeks these smears were repeated and were found to be normal. Pap smear of one of the cervical growth on speculum examination was suggestive of dense inflammation and after a course of antibiotics repeat smear taken 6 weeks later was normal. Among the abnormal cytology, the patient with ASCUS was 30 year old primigravida and other patient with HSIL was 24 years second gravida with one full term normal delivery. The patient with ASCUS was followed up till delivery and a repeat Pap smear was taken 6 weeks postnatally which was normal. Patient was advised for regular follow up. Only one patient on per speculum examination had growth with Pap smear suggestive of HSIL, biopsy was taken which showed Squamous cell carcinoma. (Figure ??) Patient had spontaneous abortion at 24 weeks of pregnancy. Patient was then referred to Regional Cancer Centre (RCC), where she was staged as IIb cervical cancer and started with radiotherapy. (Figure 9)

In asymptomatic pregnant women, a simple speculum examination of the cervix provides an opportunity to down stage cervical cancer and detect the disease at an earlier, treatable and curable stage¹⁶. In the present study, 2 patients had growth on the cervix out of which one had HSIL. Though 94%(462) patients had healthy cervix, 11.9%(55) showed infection like *Trichomonas vaginalis* 5.6%, Candidiasis 2%, Bacterial vaginal discharge was seen in 10.2%(51) of the patients, out of which 66.7%(34) patients had Pap smear suggestive of infections like *Trichomonas vaginalis* (5.6%), candidiasis (2%) and Bacterial vaginosis (4%). In remaining 89.8%(449) patients without discharge, 5.4%(24) patients had infections. This showed additional advantage of Pap smear examination in asymptomatic women as they being asymptomatic, they are unlikely to be diagnosed or treated for such conditions which otherwise leads to premature rupture of membranes, premature birth or chorioamnionitis. There was significant correlation between discharge per vaginum and abnormal cervical cytology ($P<0.001$).

Vaginosis 4% while 0.2%(1) patient had epithelial cell abnormality (ASCUS) similar to studies by C.Kurian et al and Singh et al. 8,5¹

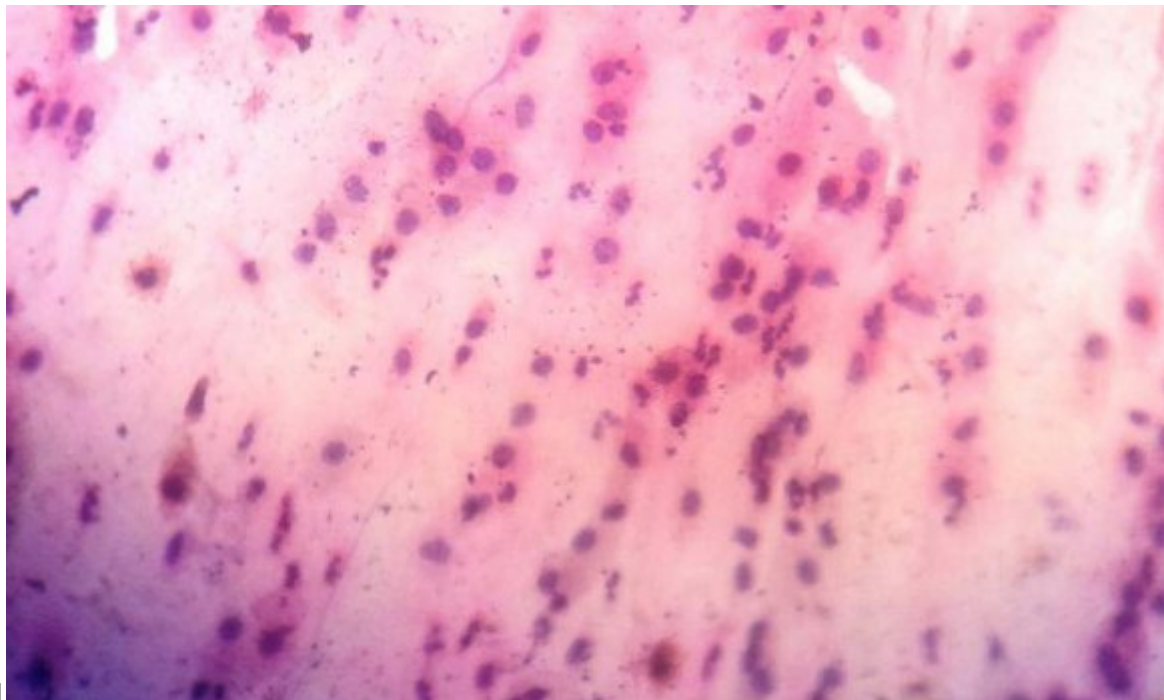
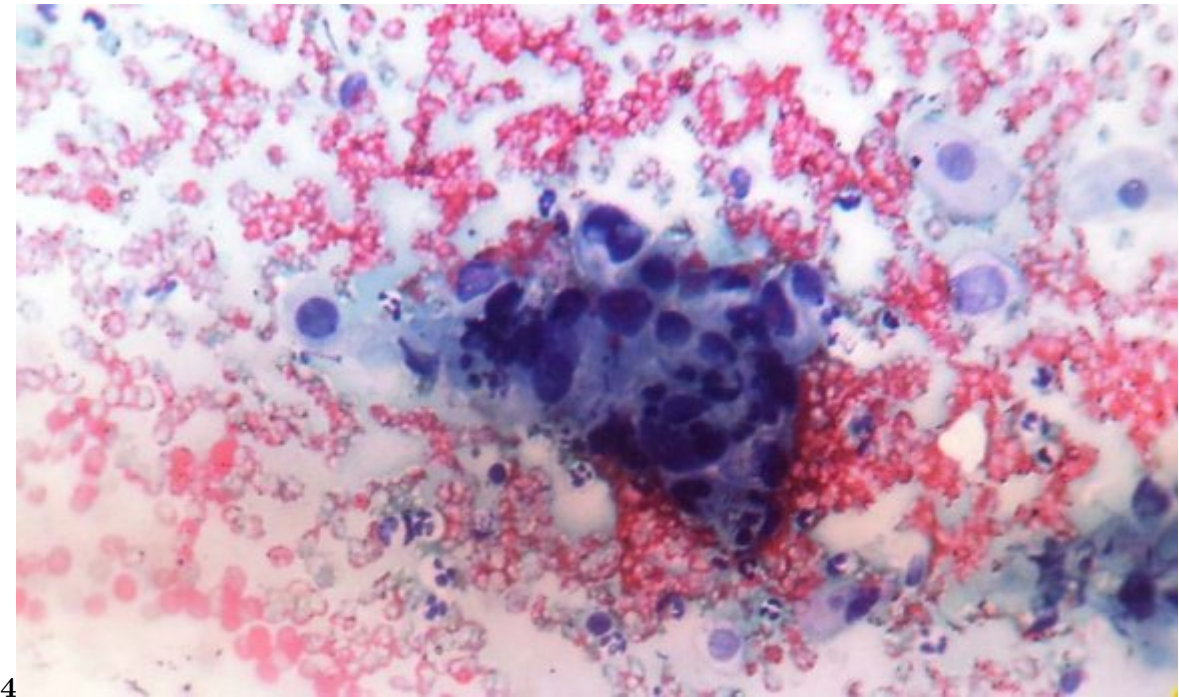


Figure 1: Figure 1 :



4

Figure 2: Figure 4 :



6

Figure 3: Figure 6 :A



9

Figure 4: Figure 9 :



2

Figure 5: Figure 2 :A



Figure 6: Figure 3 :Figure 5 :

1

*Range of age: 22-39 years
Mean age: 25.98 + 3.56 years (mean + SD)

Figure 7: Table 1 :

2

*Range: 17 -37 years
Mean age at marriage: 22.66 + 3.24 years (mean + SD)

Figure 8: Table 2 :

		500 antenatal patients participated in the study and the mean age was 25.98 ± 3.56 years with 51% of the patients in 21-25years age group.(Table 1).
Year 2020	Age in years	No. of patients (%)
	21-25	255 (51)
	26-30	191 (38.2)
	31-35 36-40 To-	49 (9.8) 5 (1) 500 (100)
	tal	
Volume XX Issue VII Version I D D D D) E (Medical Research Global Journal of		
Age at marriage in years		No. of patients (%)
<20		138 (27.6)
21-25		277 (55.4)
26-30		77 (15.4)
31-35		6 (1.2)
36-40		2 (0.4)
Total		500 (100)
© 2020 Global Journals		

Figure 9: No. of patients (%) Socioeconomic status Distribution of socioeconomic status in patients

3

Age at 1 st child birth in years	No. of patients (%)
<20	46 (9.2)
21-25	301 (60.2)
26-30	137 (27.4)
31-35	14 (2.8)
36-40	2 (0.4)
Total	500 (100)
Range: 19 -38 years	
*Mean age at 1 st child birth: 24.31 ± 3.39 years (mean + SD)	

Figure 10: Table 3 :

4

Gravida	Condom	Contraceptive methods (%)			Total no. None	of patients
		Cu-T	OC Pills	* ST Failed		
Primi gravida	1 (0.4)	00 (00)	00 (00)	00 (00)	239 (99.6)	240 (48)
Second gravida	1 (0.6)	43 (25.4)	1 (0.6)	00 (00)	124 (73.4)	169 (33.8)
Third gravida	1 (1.4)	11 (15.3)	00 (00)	2 (2.8)	58 (80.5)	72 (14.4)
Fourth gravida	00 (00)	00 (00)	00 (00)	1 (6.7)	14 (93.3)	15 (3)
Fifth gravida	00 (00)	00 (00)	00 (00)	00 (00)	3 (100)	3 (0.6)
Six gravida						
Total	3 (0.6)	54 (10.8)	1 (0.2)	3 (0.6)	439 (87.8)	5 00 (100)

[Note: $P < 0.001^{**}$, Significant, Fisher Exact test; *Sterilisation failed]

Figure 11: Table 4 :

5

Per speculum Findings	Cervix (%)	Vagina (%)
Healthy	462 (92.4)	500 (100)
Hypertrophy	1 (0.2)	00 (00)
Erosion	33 (6.6)	00 (00)
Polyp	2 (0.4)	00 (00)
Growth	2 (0.4)	00 (00)
Total	500 (100)	500 (100)

Figure 12: Table 5 :

6

$P = 0.656$, Not significant, Fisher Exact test

US-Unsatisfactory

Inf-Infection

Inflam-Inflammation

*Epi cell abnormality-Epithelial cell abnormality

Total no. of patients

		Infection present (%)	Infection absent (%)
Discharge present	51 (10.2)	34 (66.7)	17 (33.3)
Discharge absent	449 (89.8)	24 (5.4)	425 (94.6)
Total	500 (100)	58 (11.6)	442 (88.4)

$P < 0.001^{**}$, Significant, Fisher Exact test

Figure 13: Table 6 :

7

Figure 14: Table 7 :

9

Study	Observations regarding age
Singh P et al 5	
Ayten Dinc 4	
Kaplan et al 6	26 years
Cronje et al 7	27 years
Present study	
The incidence of abnormal cervical cytology was more in low socioeconomic classes(62.8%) based on B G Prasad's classification comparable to a study by C.Kurian et al 8 .	

Figure 15: Table 9 :

Year 2020
28
Volume XX Issue VII Version I
D D D D)
(
Medical Research
Global Journal of

[Note: E© 2020 Global Journals]

Figure 16:

10

Study	knowledge about Pap smear	Previous Pap smear
Nguyen et al 13	74%	76%
Ayten Dinc 4	60.7%	30.1%
Hande CM et al 14	90.7%	-
C.Kurian et al 8	-	0.39%
Present study	5.2%	0.6%

Figure 17: Table 10 :

11

	No. of study population	Incidence of ab- normal smear	Abnormal smear details
Present study	500	0.4%	1 ASCUS 1 HSIL
Kaplan et al 6	6248	2.5%	129 LSIL 28 HSIL
C.Kurian et al 8	1002	0.19%	1 ASCUS 1LSIL
Singh P et al 5	590	0%	-

Figure 18: Table 11 :

.1 Acknowledgements

We express our gratitude to all the patients who participated in the study.

.2 Declarations Funding: No funding sources

.3 Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

[Cuzick et al. ()] 'A case-control study of cervix cancer in Singapore'. J Cuzick , B De , D Mc Cance , T H Ho , G Tan , H Cheng , Y M Salmon . *Brit J Cancer* 1989. 60 p. .

[Hande Celik Mehmetoglu and Sadikoglu ()] 'Alis Ozcakil, Nazen Bilgel. Pap smear screening in the primary health care setting: A study from Turkey'. Ganime Hande Celik Mehmetoglu , Sadikoglu . *N Am J Med Sci* 2010. 2 p. .

[Jones et al. ()] 'Cervical carcinoma and pregnancy: A national patterns of care study of the American college of surgeons'. W B Jones , H M Shingleton , A Russell , A M Fremgen , R E Clive , Dprk Winchester . *Cancer* 1996. 77 p. .

[Ananth ()] 'Down staging of cervical cancer'. R Ananth . *J Indian Med Assoc* 2000. 98 p. .

[Hoskins et al. ()] W J Hoskins , C A Perez , R C Young , R Barakat , M Markman , M Randall . *Principles and practical of Gynecologic oncology*, (Philadelphia) 2005. Lippincott Williams and Wilkins. (4th ed)

[Nguyen et al. ()] 'Management of stage I cervical cancer in pregnancy'. C Nguyen , F J Montz , R E Bristow . *Obstet Gynecol Surv* 2000. 55 p. .

[Kurian and Cyriac ()] 'P0015 Cervical cytological changes detected by papanicolaou smear in antenatal patients attending a tertiary care centre'. C Kurian , S Cyriac . *European Journal of Cancer* 2014. 50 p. .

[Ayten ()] 'Pap Smear Screening Results for Turkish Pregnant Women'. D Ayten . *Asian Pacific J Cancer Prev* 2012. 13 p. .

[La et al. ()] 'Parity as a risk factor for cervical cancer'. Brinton La , W C Reeves , M M Brenes , R Herrero , R C De Britton , E Gaitan . *Am J Epidemiol* 1989. 130 p. .

[Nguyen et al. ()] 'Predictors of cervical Pap smear screening awareness, intension and receipt among Vietnamese-American women'. T T Nguyen , S J Mcphee , T Nguyen , T Lam , J Mock . *Am J Prev M* 2002. 23 p. .

[Kaplan et al. ()] 'Prognosis and recurrence risk for patients with cervical squamous intraepithelial lesions diagnosed during pregnancy'. K J Kaplan , L A Dainty , B Dolinsky , G S Rose , J Carlson , M Mchale . *Cancer (Cancer Cytopathol)* 2004. 102 p. .

[Juneja et al. ()] 'Role of degree of sexual activity in cervical carcinogenesis'. A Juneja , N S Murthy , S Sharma , A Sehgal , V Singh , R Menon , R K Tuteja , D K Das . *Cancer journal* 1995. 8 p. .

[Singh and Baghel ()] 'Screening of pregnant women for cervical malignancies'. P Singh , V Baghel . *Int J Reprod Contracept Obstet Gynecol* 2013. 2 p. .

[Kaminski et al. ()] 'Significance of atypical cervical cytology in pregnancy'. P F Kaminski , D S Lyon , J I Sorosky , J B Wheelock , E S Podzasky . *Am J Perinatol* 1992. 9 p. .

[WHO/ICO Information center on HPV and Cervical Cancer (HPV Information Centre). Human Papillomavirus and related cancers. WHO/ICO Information center on HPV and Cervical Cancer (HPV Information Centre). *Human Papillomavirus and related cancers in India. Summary*, 20.