Original Research Article

Cervical pap smear study and its utility in cervical cancer detection and prevention

Vijaya Karra[1], Pamu Shiva Ramulu[2], Rajanikar[3], Boinapalli Sudhakar[4],*

[1]Dept. of Obstetrics and Gynecology, Surabhi Institute of Medical Sciences, Siddipet, Telangana, India
[2]Dept. of General Surgery, Surabhi Institute of Medical Sciences, Siddipet, Telangana, India
[3]Dept. of Pathology, Surabhi Institute of Medical Sciences, Siddipet, Telangana, India
[4]Dept. of Biochemistry, Surabhi Institute of Medical Sciences, Siddipet, Telangana, India

A R T I C L E   I N F O

A B S T R A C T

Objectives: The objective of present study to find out women for precancerous lesions with the help of pap smear test as early identification marker. Determine the percentage of cervical cancer in relationship with demographic, education and occupation. To find out pap smear effectiveness in various infections. To find out correlation pap smear findings with symptoms.

Materials and Methods: This is a cross-sectional study involving the screening of women from the rural population of Siddipet district for the assessment of health status using pap smear test who have attended the outpatient department of Obstetrics and Gynecology conducted during the period of August 2019 to May 2021.

Results and Discussion: The present study included 1500 Pap smears, of which the most common abnormality was inflammatory smear, which is followed by atrophic smear. Among all the study respondent's majority (64.5%) of the women were home makers and not working, remaining participants were either self employed or working women. Percentage of abnormal smear reports was reported in group 2 (31-40 years) subjects followed by group 3 (41-50 years) women. In 22 patients, Atypical Squamous Cell of Undetermined Significance (ASCUS) was observed. The present study reported very less cervical cancer prevalence in our study population.

Conclusion: Pap smear testing is a sensitive and effective screening test which can be used for identification of precancerous epithelial lesions. Pap smear test should be recognized as a routine screening method to decrease Mortality and Morbidity due to the cervical cancer. This study also regard us as paps smear is a gold standard for cervical screening. This study also suggests that every woman above the age 30 years should undergo screening programs for cervical cancers. So Morbidity and Mortality due to cervical cancers can be prevented by early identification of cervical cancer by doing screening at regular intervals.

1. Introduction

Cervix cancer is a rising health issue and significant cause of mortality in Women across the globe. The incidence of cervical cancer increased in worldwide. Pap smear is the most important test which is used to assess the women health and early detection of cervical cancer. Cervical screening has been one of the most successful public health program practiced for the prevention of cervical screening. Cervical Cytology forms the basis for this screening. Therefore, this test is recommended by the gynecologists to all women who are sexually active. Pap smear test is a cytological screening test introduced by George Papinicolaou in 1940 in the diagnosis and prevention of cervical cancer.[1]

* *Corresponding author.*
E-mail address: boinapallisudhakar@gmail.com (B. Sudhakar).

Though many studies have reported less prevalence of cervical cancer in women who are screened annually, it is recommended that, pap smear test can be repeated at least once in every year to check the health status of a women.[2,3] Pap smear test is not recommended for those women who are below the age of 21 years because of low incidence of cervical cancer and is also associated with high false positive.[4,5]

The American College of Obstetricians and Gynecologists (ACOG) in 2009, recommended that pap smear test can be advised for the married women who are above theage of 21years.[5] It also stated that women aged in between 21-29 should be screened for the same every three years. The organization noted that women ages between 30 to 65 years should undergo pap smear with HPV testing every 5 years, and screening should stop after age 65.[6,7]

As mentioned earlier pap smear screening is important to assess the health and in the diagnosis of cervical cancer. There is limited data available on the health status of the women from rural population of Tamil Nadu, India. Hence, the present study was designed to understand the health status of the women of rural population of Siddipet and Siddipet district of the Telangana, India. The results of this study can help to design the necessary educational programs and counseling services, also to reduce the gaps and barriers to improve the quality of health services for women in the society.

2. Materials and Methods

2.1. Study design

The study was a cross-sectional study involving the screening of women from the rural population of siddipet district for the assessment of health status using pap smear test who have attended the outpatient department (OPD) of Obstetrics and Gynecology (OBGY) at Surabhi Multispecialty Hospital, Mittapally, Siddipet, Telangana, India. The study was conducted during the period of August 2019 to May 2021.

2.2. Inclusion criteria

Married women from the rural areas of Siddipet district and belongs to siddipet district of Telangana, India, attending OPD of Obstetrics and Gynecology Department at Surabhi Multispeciality Hospital, were included in this study.

2.3. Exclusion criteria

Women who have undergone pap smear test within a period one year, pregnant women, who were in menstruation, and those who are already diagnosed with cervical cancer were excluded from the study.

Demographic, educational, and socioeconomic factors, sexual behavior, use of contraceptives, pap smear testing and other related gynecological and obstetrics history was collected from the patients during their visit to the OPD. A total of 1500 patients were recruited for the study during the study period. All the participants were subjected to pap smear test after obtaining informed consent. The samples were sent to the central clinical lab for processing, evaluation, and diagnosis. For those smears found to be satisfactory for evaluation, cytological abnormalities were reported based on the Bethesda System.[8] The slides were examined, and results were reported by the pathologist. Since 1988, the Bethesda System for Reporting Cervical Cytology has been the accepted reporting system in the United States. The 2014 revision is the most recent.[8] The reporting format includes Specimen type, Specimen adequacy, General Categorization, Interpretation/Result, Epithelial Cell Abnormalities and other malignant neoplasms.[7,8]

2.4. Ethics approval

The study protocol was approved by the Institutional Ethics Committee of Surabhi institute of Medical Sciences, Mundrai, Mittapally village, Telangana, India. Written and oral consent was obtained from the individuals who participated in the screening before registration and were ensured of the confidentiality of their report. Participation in the study is purely voluntary and did not have any financial burden for the participants.

2.5. Statistical analyses

Descriptive indices including mean and standard deviation for quantitative variables and number and percent for categorical variables were reported. Logistic regression was performed to investigate the associated factor with behavior. All analysis was performed in SPSS version 16.0.

3. Results

This cross-sectional study was conducted at Surabhi multispecialty Hospital, Telangana, India. Study includes participation of 1500 women who are willing to take part in the study. Demographic data like age, marital status, education, occupation, and parity of all the study subjects was noted and tabulated in Table 1. There are total of 1500 participants in this study. Based on their age the participants were categorized into five groups. Group 1 consists of participants aged between 21 – 30 years, Group 2 consists of participants aged between 31 – 40 years, Group 3 consists of participants ranged between 41 – 50 years, Group 4 consists of 51 – 60 years and Group 5 consists of women aged above 60 years (Table 1). Highest number of participants (485 – 32.3%) were in the age group of 31 – 40 years, followed by 41 -50 years (443 – 29.5%) and least number

of participants (79 – 5.3%) were in the age range of >60 years. All the participants who took part in the pap smear screening test were married (Table 1) and above the age of 21 years (Figure 1). The mean age of the study population is 38 ± 9 years and highest numbers of participants were in the age group of 31 – 40 years.
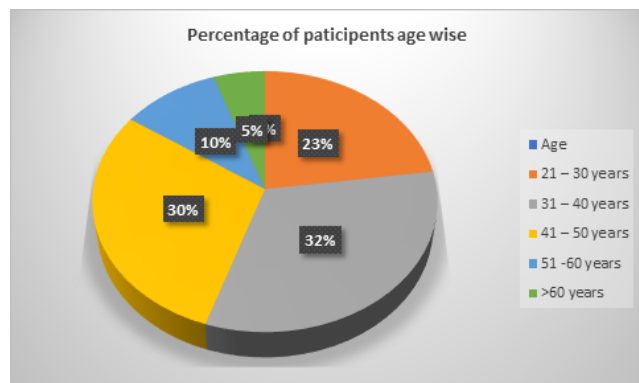

Fig. 1: Shows the percentage of participants as per the age group categorized in the study

Of all the study participants 15.3% women were not having the formal basic education, 23.9% had primary school education, 33.5% of the women have completed secondary school education, 20.4% of the women have higher secondary education and 6.8% of the women were having degree and above educational qualification (Table 1, Figure 2).
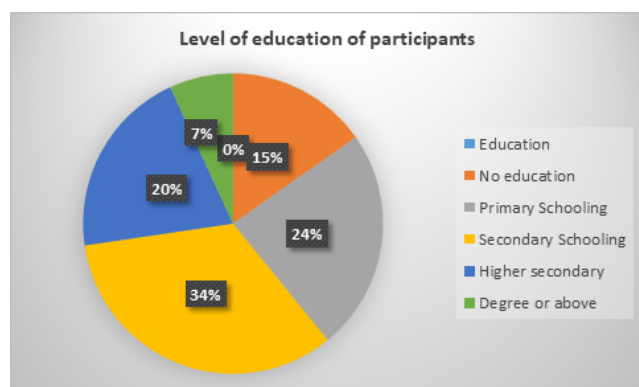

Fig. 2: Shows the level of education of study participants

Symptoms present in the women selected for the study include Urinary Tract Infection (UTI) in 9.5% of the population, bleeding vaginum in 24.3%, white discharge in 66.2%, and 9.2% women were asymptomatic. Among all the participants 3.1% of the women were nulliparous and remaining 96.9% of the women are primi or multiparous (Table 3, Figure 3). PAP smear findings were tabulated in (Table 3) and categorized as per the age group of the women. In group 1 there are total 342 women, of

them 208 women presented with normal smear report, inflammatory smear was seen in 106 women, 5 women were presented with candidiasis, 1 presented with Ascus, 10 people showed bacterial vaginosis, 4 people showed Trichomonas Vaginalis and 8 samples were inadequate so no diagnosis was confirmed for those samples (Table 3, Figure 3) Group 2 includes a total 485 women, of them 255 pap smear reports were normal, 156 women presented with inflammatory reports, 7 women reported with candidiasis, 9 women were presented with Ascus, 14 women were presented with bacterial vaginosis, 5 atrophic smears were reported in this group, 12 women were presented with Trichomonas Vaginalis, 27 samples were inadequate (Table 3, Figure 4). Group 3 includes 443 women, of them 224 women were presented with normal smear report, 112 pap smear reports were inflammatory smear, 6 women were reported candidiasis, 8 were presented with Ascus, 7 were presented with bacterial vaginosis, 54 were presented with atrophic smear, 3 people were presented with Trichomonas Vaginalis, 29 samples were inadequate (Table 3, Figure 4). Group 4 includes 151 women, of them 54 were presented with normal smear report, 30 women were reported with inflammatory smear, 1 Ascus sample was reported, 3 samples were bacterial vaginosis, 50 atrophic smears and 13 samples were inadequate (Table 3, Figure 4). Group 5 includes 79 women, of them 16 samples were normal, 13 samples were inflammatory, 3 samples were reported Ascus, 1 women reported Bacterial Vaginosis, 39 samples were reported as atrophic smear, and 7 samples were inadequate (Table 3, Figure 4).
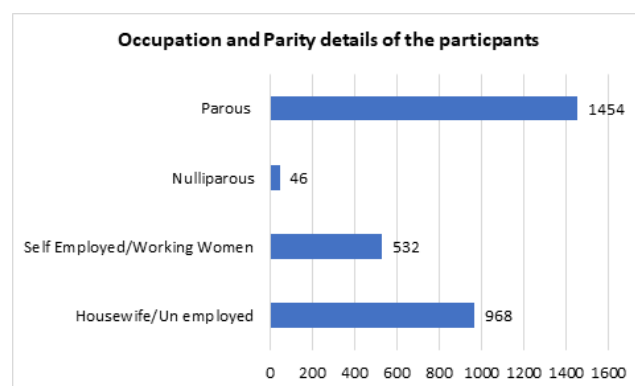

Fig. 3: Shows the occupation and parity details of study participants

.

4. Discussion

The present study is a hospital-based study conducted in a tertiary care hospital situated in rural set up women from nearby villages visiting our hospital OPD, department of obstetrics and gynecology were recruited for the study. It

Table 1: Demographic, educational, occupational, and obstetrics history details of the study participants

Parameter	N	%
Age		
21 – 30 years	342	22.8%
31 – 40 years	485	32.3%
41 – 50 years	443	29.5%
51 -60 years	151	10.1%
>60 years	79	5.3%
Marital Status		
Married	1500	100%
Education		
No education	229	15.3%
Primary Schooling	358	23.9%
Secondary Schooling	503	33.5%
Higher secondary	307	20.4%
Degree or above	103	6.8%
Occupation		
Housewife/Un employed	968	64.5%
Self Employed/Working Women	532	35.4%
Parity		
Nulliparous	46	3.1%
Parous	1454	96.9%

Table 2: Symptoms of the patients presented with at OPD at the time of pap smear screening

Parameter	N	%
Symptoms		
Not recorded	0	0
No complaints	137	9.2%
Complaints present	1363	90.8%
White discharge	901	66.2%
Vaginal Bleeding	332	24.3%
UTI	130	9.5%

Table 3: Summary of the pap smear studied for all the participants

Age	Normal	Inflammatory smear	Candidiasis	Ascus*	Bacterial vaginosis	Atrophic smear	Trichomonas vaginalis	Inadequate	Total
Group 1 (21 – 30 years)	208	106	5	1	10	0	4	8	342 (22.8%)
Group 2 (31 – 40 years)	255	156	7	9	14	5	12	27	485 (32.3%)
Group 3 (41 – 50 years)	224	112	6	8	7	54	3	29	443 (29.5%)
Group 4 (51 -60 years)	54	30	0	1	3	50	0	13	151 (10.1%)
Group 5 (>60 years)	16	13	0	3	1	39	0	7	79 (5.3%)
	757	417	18	22	35	148	19	84	1500

*Atypical Squamous Cell of Undetermined Significance (ASCUS)
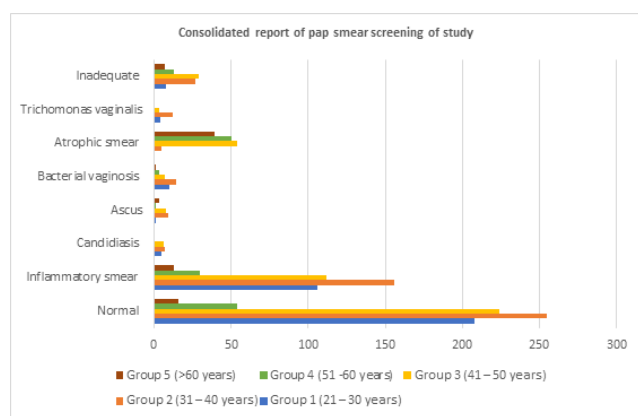
Fig. 4: Depicts the details of consolidated pap smear analysis report of all the study participants

is recommended that pap smear screening test should be started above the 21 years of age.[8–10]

The present study included 1500 Pap smears, of which the most common abnormality was inflammatory smear, which is followed by atrophic smear. Among all the study subject's majority (64.5%) of the women were home makers and not working, remaining participants were either self-employed or working women. Percentage of abnormal smear reports was reported in group 2 (31-40 years) subjects followed by group 3 (41-50 years) women. In 22 patients, Atypical Squamous Cell of Undetermined Significance (ASCUS) was observed. Lack of health education on personal hygiene and knowledge on safe sexual practices in women from rural areas are one of the reasons for high rates inflammation and infection of cervix which can lead to cervical cancer in India.[11–13]

Study done by Gupta et al. in[3] 4703 women in the year 2013 reported an incidence of 0.52% ASCUS, but they had, Low-grade squamous intraepithelial cell lesion (LSIL) as the most common epithelial cell abnormality (1.36%) instead of ASCUS (3). Many hospital based studies showed that LSIL is the most prevalent epithelial cell abnormality. Studies reported by Sengul et al. and Nair et al. showed maximum cases of ASCUS among the various epithelial cell abnormalities which is in line with the present study reports.[4,8,12–17] The study conducted by Nene et al. in[12] 79,449 women and the study conducted by Misra et al.,[18] in 4279 rural women population of India, reported the lowest and highest rate of epithelial cell abnormality in 0.92% and 18.8% of cases, respectively.[12,18] The present study reports showed less rate of cervical cancer prevalence in our study population compared to the studies conducted by Bhattacharyya AK et al. which is 2.6% (studied in 5032 women) and Satyanarayan et al., reported 2.6% (study conducted in 7603 women) in 2014.[14,19]

Vision 2030 of the United Nations Global Join Program is to tackle the cervical cancer by ensuring reproductive health and reducing the gaps within and among countries.[9,19–22] It recommends all the countries and their governments to strengthen their research capacity by all means to support decisions on countryadapted screening and treatment plans. As our tertiary care center is in the rural area of Tamil Nadu the rate of women's referral for screening is very low because of social, lack of proper education and economical barrier for undergoing the Pap smear test.

The present study reports the hospital based pap smear test screening data in Surabhi Multispecialty Hospital, Siddipet, Telangana, India. The Indian government is also implementing a national program under NPCDCS since 2016.

5. Conclusion

More number of hospital based studies with large sample size is needed to be conducted in India and other developing countries for assessing the reproductive health and prevalence of cervical cancer in women. The study data from the teaching hospitals should be published so that researchers will come up with more effective strategies for the management of the disease and help in while planning national wide programs. It can be concluded that Pap smear is a sensitive and effective screening test which can be used for assessing the reproductive health status of the women and in the early detection of cervical cancer by doing screening at regular intervals.

6. Conflict of Interest

None.

7. Source of Funding

Acknowledgements

References

1. Karunakaran U, Thekkandathil N, Divakaran B, Joseph MM, Kannankai S, Kumaran JA, et al. Cervical cancer screening program a camp based cross sectional study among rural women in North Kerala. *Sci J Public Health*. 2017;5:215–23.
2. Sreedevi A, Javed R, Dinesh A. Epidemiology of cervical cancer with special focus on India. *Int J Womens Health*. 2015;7:405–14.
3. Gupta K, Malik NP, Sharma VK, Verma N, Gupta A. Prevalence of cervical dysplasia in Western Uttar Pradesh. *J Cytol*. 2013;30:257–62.
4. Sengul D, Altinay S, Oksuz H, Demirturk H, Korkmazer E. Population-based cervical screening outcomes in turkey over a period of approximately nine and a half years with emphasis on results for women aged 30-34. *Asian Pac J Cancer Prev*. 2014;15:2069–74.

5. ACOG Practice Bulletin No. 109 Cervical cytology screening. *Obstet Gynecol*. 2009;114:1409–20.
6. Kumari M, Kolte S. Experience of cervical Pap smear screening in tertiary care hospital. *Int J Med Sci Public Health*. 2020;9(1):68–71.
7. Kitchen FL, Cox CM. Papanicolaou Smear. [Updated 2020 Oct 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470165/.
8. Nayar R, Wilbur DC. The Pap test and Bethesda. *Cancer Cytopathol*. 2014;123(5):271–81.
9. Screening for Cervical Cancer: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2018;7:674–86.
10. Dhanasekaran K, Verma C, Kumar V, Hariprasad R, Gupta R, Gupta S, et al. Cervical Cancer Screening Services at Tertiary Healthcare Facility: An Alternative Approach. *Asian Pac J Cancer Prev*. 2019;20:1265–9.
11. Kothari S, Gohel A, Dayal A, Shah R, Patel S. Pap smear a tool for detection of cervical intraepithelial lesions in health check up schemes: A study of 36,740 cases. *Int J Res Med*. 2014;3:12–5.
12. Nene B, Jayant K, Arrossi S, Shastri S, Budukh A, Hingmire S, et al. Determinants of womens participation in cervical cancer screening trial. *Bull World Health Organ*. 2007;85:264–72.
13. Sachan PL, Singh M, Patel ML, Sachan R. A study on cervical cancer screening using pap smear test and clinical correlation. *Asia Pac J Oncol Nurs*. 2018;5:337–41.
14. Bhattacharyya AK, Nath JD, Deka H. Comparative study between pap smear and visual inspection with acetic acid (via) in screening of CIN and early cervical cancer. *J Midlife Health*. 2015;6(2):53–8.
15. Blatt AJ, Kennedy R, Luff RD, Austin RM, Rabin DS. Comparison of cervical cancer screening results among 256,648 women in multiple clinical practices. *Cancer Cytopathol*. 2015;123:282–8.
16. Hyacinth HI, Adekeye OA, Ibeh JN, Osoba T. Cervical cancer and pap smear awareness and utilization of pap smear test among federal civil servants in north central Nigeria. *PLoS One*. 2012;7(10):e46583.
17. Felix JC, Lacey MJ, Miller JD. The clinical and economic benefits of co-testing versus primary HPV testing for cervical cancer screening: A modeling analysis. *J Womens Health (Larchmt)*. 2016;25:606–16.
18. Misra JS, Srivastava AN, Gupta HP. Impact of literacy status on the cervical cancer screening in rural women of India. *Invest Gynecol Res Womens Health*. 2017;1(2):41–5.
19. Satyanarayana L, Asthana S, Bhambani S, Sodhani P, Gupta S. A comparative study of cervical cancer screening methods in a rural community setting of North India. *Indian J Cancer*. 2014;51:124–8.
20. Nair GG, Shamsuddin F, Narayanan T, Balan P. Cytopathological pattern of cervical pap smears-a study among population of North Malabar in Kerala. *Indian J Pathol Oncol*. 2016;3:552–7.
21. Shaki O, Chakrabarty BK, Nagaraja N. A study on cervical cancer screening in asymptomatic women using papanicolaou smear in a tertiary care hospital in an urban area of Mumbai, India. *J Family Med Prim Care*. 2018;7:652–7.
22. Arun R, Singh JP, Gupta SB. Cross-sectional study on visual inspection with Acetic Acid and pap smear positivity rates according to sociodemographic factors among rural married women of Bareilly (Uttar Pradesh). *Indian J Community Med*. 2018;43:86–9.

Author biography

Vijaya Karra, Assistant Professor

Pamu Shiva Ramulu, Assistant Professor

Rajanikar, Assistant Professor

Boinapalli Sudhakar, Professor