

Comparative Assessment of Age and parity as risk factors of Cervical Cancer in Rural women population of Lucknow, India

Jata S Misra, Ph.D^{*,†}, Anand N Srivastava, M.D², Zeeshan H Zaidi, Ph.D³

¹ Cytologist, Department of Pathology, Era's Lucknow Medical College and Hospital, Era University, Lucknow, (Uttar Pradesh), India

² Director Research, Era's Lucknow Medical College and Hospital, Era University, Lucknow, (Uttar Pradesh), India

³ Assist. Prof. , Department of Community Medicine, Era's Lucknow Medical College and Hospital, Era University, Lucknow, (Uttar Pradesh), India

DOI: <https://doi.org/10.15520/ijmhs.v10i08.3077>

Accepted 15/08/2020; Received 15/07/2020; Publish Online 31/08/2020

Reviewed By: Dr.
Daniel V.
Department: Medical

ABSTRACT

Background - Age and parity of the participating women have been normally considered as major risk factors of carcinoma cervix in a screening program.

Objective- Comparative assessment has been made of these two factors in 2949 rural women. to see which of these two play effective role in cervical carcinogenesis or cumulative effect of both has greater impact.

Methods – The 2949 women were derived from the ongoing Rural cervical cancer screening program carried out in the villages of west Lucknow by organizing camps. The squamous intraepithelial lesions of cervix (SIL) incidence have been analyzed in different age groups with increasing parity and vice-versa.

Results- The findings revealed no relation between SIL incidence and increasing age but a correlation with increasing parity. The SIL incidence in the different age groups with increasing parity revealed two trends- adolescents and postmenopausal women showing high SIL rate with nulliparity which declined with increasing parity while the adult girls and women (21-40 years) showed SIL incidence rising with increasing parity. When the SIL incidence was analyzed in different parity groups with increasing age, the rise in SIL incidence was seen with increasing parity in adult women between 21-40 years.

Conclusion- Though the comparative study showed increasing parity playing dominant role in the SIL development but the SIL rate was also found higher with nulliparity in adolescents and postmenopausal women. Hence all rural women showing primary infertility have to be cytologically examined and treated. Further cytology is mandatory in all multiparous women between 21-40 years of age.

Key words: Increasing age and parity–Squamous Intraepithelial lesions of cervix
Nulliparity–Adolescents–Postmenopausal women

1 INTRODUCTION

Carcinoma cervix is a major health problem in rural population of India and of significant importance as 70% of total Indian population live in the villages.^[1] The situation is precarious as majority of the rural women are ignorant of risk factor of cervical cancer like early marriage and mul-

tiparity and also the importance of early detection of the disease. The catalytic factors to these problems are illiteracy and poverty prevailing in the villages which make them unaware of personal genital hygiene and consequent persistent vaginal infections. Lack of medical amenities in the villages to detect and treat the vaginal infections makes them persistent and vulnerable to the precancerous manifestations in the cervix.

HPV infection has been widely implicated in the process of cervical carcinogenesis.^{[2][3][4]} Since, the SIL lesions

* Corresponding author.

† Email: jata_misra@yahoo.com.

have been found to progress to high grade in women who are HPV- negative, it appears that the etiology of carcinoma cervix is multifactorial and many other factors such as age and parity are also involved in the process of malignant transformation of SIL which is a long process extending upto 8 to 10 years.^[5] Two important facts vastly experienced in the rural population – marriage at early adolescent age involving earlier sexual activity prolonging to more than 20 years and multiparity because of lack of -knowledge of Family Planning measures due to illiteracy appears to be instrumental in development of cervical cancer in the villages. It will be quiet interesting to find out the role of these two risk factors (age and parity) in the causation of SIL and its progression or a combination of both leading to a greater impact. As rural cervical cancer screening program is in progress in the villages of west Lucknow since May 2013 under the auspices of Era’s Lucknow Medical College and Hospital, Lucknow through camp approach and till February 2020, a total of 186 camps have been organized in these 7 years duration in different villages and Pap smears have been taken and examined in 2949 women out of total 5286 attending the camps (55.8%). We have sufficient information regarding age and parity of these 2949 women and have tried to extensively investigate role of these two factors through analysis of the SIL incidence in the different age groups with varying parity and in different parity groups with varying age. The data obtained may yield which of these two factors or cumulative effect of both have greater impact in contributing to the SIL development under rural conditions.

2 MATERIALS AND METHODS

The present study shows detailed age and parity pattern in 2949 women cytologically examined during rural cervical cancer screening carried out during last 7 years (May 2013- February2020) in the villages of west Lucknow, India. A total of 186 camps have been organized in different villages after proper counseling and motivation of 100 women from each village for attending the camp. These women were told regarding the risk factors of cervical cancer and importance of the early detection of the disease. A total of 5286 women attended these camps (28.4%) of whom only 2949 (55.8%) opted for Pap test. The cervical smears in these women were taken by the gynecologist attending the camp with the help of wooden spatula from the squamocolumnar junction of cervix. The collected smears were taken to the cytology lab of the Pathology Department of the college where they were stained according to the Papanicolaou technique. The stained smears were graded according to the revised Bethesda system of classification.^[6]

As we have detailed information about the age and parity of 2949 women registered, we thought it interesting to investigate and compare the SIL incidence in different age groups with varying parity and vice-versa. This comparative assessment may tell which of these two factors are effectively

associated with SIL changes in the cervix or combination of both has a greater impact. The entire data has been critically analyzed in detail and presented in this paper.

The study protocol of rural cervical cancer screening was approved by the Ethics Committee of the Era’s Lucknow Medical College and Hospital, Era University, Lucknow India. The women of the study group have undergone Pap smear examination with their consent and the informed consent was obtained from them on the Pap smear form in the form of thumb impression if they were illiterate or signature if literate.

All the collected data were stastically analyzed using chi-square test with software SPSS and version 22.

3 RESULTS

The cytological examination of cervical smears in 2949 women revealed following findings-

SIL- 498(16.8)
 Low grade SIL (LSIL) - 472(16.0%)
 High grade SIL (HSIL) - 26(0.8%)
 Carcinoma cervix - 2(0.06%)

The SIL incidence was very high (16.8%) under rural conditions but it was heartening to note that 472 of the total 498 SIL cases were LSIL. The HSIL was seen in only 26 cases (0.8%). Frank cancer was seen in only 2 cases (0.06%). A high SIL incidence in rural women may be related to the poor genital hygiene because of illiteracy which make them vulnerable to persistent vaginal infections leading to the premalignant changes in the cervix.

The incidence of SIL in different age groups starting from adolescent age of 16-20 years to postmenopausal women beyond 60 years is shown in Table-1. The SIL incidence did not show rise with increasing age. The SIL incidence was higher in young girls and women between 21-40 years 17.6% but declined to 14.9% in women beyond 40 years of age. However, the difference in the SIL incidence in the different age group was found to be stastically insignificant ($\chi^2 = 2.41$; $p= 0.492$). A high SIL incidence in the young age group of women between 21-40 years which formed the major component of the screened women (72.5%) may be due to the fact that majority of these women were symptomatic.

The SIL incidence in different parity groups among 2949 women is shown in Table-2. The SIL rate showed progressive rise with increasing parity from 14.8% seen in the nulliparous women to 17.5% in the multiparous women with three or more children. However, the difference in the SIL incidence in the different parity groups was found to be stastically not significant

($\chi^2 = 2.42$; $p=0.490$). Hence, the study though revealed some relationship between SIL rate and increasing parity but this was found lacking with the age.

The detailed analysis of 2949 women registered was carried out by categorizing them into two groups-

- a). The women of different age group with increasing parity, and
- b). Women of different parity group with increasing age.

The SIL incidence in each individual age groups with increasing parity is shown in Table-3. In the adolescent girls between 16-20 years, the SIL rate was high with nulliparity (20.9%) which declined with increasing parity to 10.5% in the girls with three children. In adult girls between 21-30 years, the SIL rate was 10% with nulliparity but rose twice to 20.7% in multiparous women and the rise was stastically significant ($\chi^2 = 829$; $p < 0.001$). The similar trend was also seen in adult women in between 30-40 years of age, the SIL rate rising from 13.3% in nulliparous women to 18.6% with multiparity. However, in old women beyond 40 years of age, reverse trend was seen with SIL rate being maximum with nuliparity (30%) and declining with increasing parity to 14.5% with multiparity and the difference was stastically significant. Hence, a relationship was seen between SIL rate and increasing age and parity except in adolescents and postmenopausal women where a reverse trend was seen. It should be pointed out here that almost 80% of the total 2949 women of the study group were between 21-40 years and they attended the camps and also had cervical smear taken because most of them were symptomatic complaining of vaginal discharge or menstrual irregularities. Further many of women of this group were literate and were easily convinced for getting Pap smear done.

The SIL incidence was analyzed in different parity groups with increasing age (Table-4). The SIL rate showed fluctuating trend as in the nulliparous women, the SIL rate was high in the adolescent girls (20.9%) and in older women beyond 40 years (30%) but was low (10% each) in adult girls (21-30 years) and adult women (31-40 years). In parity1 cases, the SIL rate showed rise with increasing age being maximum in old women beyond 40 years of age ($\chi^2 = 807$; $p < 0.001$). In parity 2 cases, the SIL incidence was maximum in young girls between 21-30 years (22.3%) after which it declined. In women with three or more children, the SIL rate was high in adult girls and women (21-40 years) but declined in older women above the 40 years of age. Hence multiparous women in young and adult group of age between 21-40 years are more at risk of developing SIL as majority of them were symptomatic ($\chi^2 = 807$; $p < 0.001$).

Table 1. Relation of SIL incidence with increasing age

Age group	No. of women	SIL incidence
16-20 years	117	18(15.3%)
21-30 years	1163	206 (17.7%)
31-40 years	973	171(17.5%)
Above 40 years	696	106(14.7%)

Table 2. Relation of SIL with parity

Parity group	No. of Cases	SIL incidence
Nulliparous	182	27(14.8%)
Parity 1	259	43(16.6%)
Parity 2	480	72(15.0%)
Parity 3 and above	2028	356(17.5%)

Table 3. Relation between SIL incidence in different age groups with increasing parity

Age groups	Nulliparous	Parity1	Parity 2	Parity 3 and above
16-20 years No. of cases SIL rate	62 13(20.9%)	23 3(13.1%)	13 -	19 2(10.5%)
21-30 years No. of cases SIL rate	90 9(10.0%)	179 31(12.3%)	268 46(17.4%)	626 120(19.1%)
31-40 years No. of cases SIL rate	15 2(13.3%)	34 5(14.7%)	148 19(12.8%)	776 145(18.6%)
Above 40 years No. of cases SIL rate	10 3(30%)	23 4(17.3%)	51 7(13.7%)	612 89(14.5%)

Table 4. Relation between SIL incidence in different parity groups with increasing age

Parity group	16-20 years	21-30 years	31-40 years	Above 40 years
Nulliparous No. of cases SIL rate	62 13(20.9%)	90 9(10.0%)	20 2(10.0%)	10 3(30%)
Parity1 No. of cases SIL rate	23 3(13.1%)	179 31(17.3%)	34 5(14.7%)	23 4(17.4%)
Parity2 No. cases SIL rate	13 -	268 46(22.3%)	148 19(12.8%)	51 7(13.7%)
Parity3 and above No. of cases SIL rate	19 2(10.5%)	626 120(19.1%)	776 145(18.6%)	607 89(14.5%)

4 DISCUSSION

In the rural women population of Lucknow studied, the SIL incidence showed no relation with increasing age but the SIL rate was found to rise with increasing parity being maximum in the multiparous women in all age groups. On the contrary, Misra et al, have seen progressive rise in the SIL incidence with both age and parity in the urban population of Lucknow.^[7] As emphasized earlier, out of the total 2949 women who were cytologically examined, 2136 (72.5%) were adult girls between 21-30 years of age and adult women between 31-40 years and a high SIL rate was seen in these two groups. This may be due to fact that majority of the women belonging to these two groups were symptomatic. Nikumbh et al have also found 81% of women belonging to 21-30 years in a rural screening in Maharashtra.^[8] A high SIL rate as reported by us in young symptomatic women between 21-40 years especially in those complaining of vaginal discharge have also been found by Srivastava et al^[9] Nikumbh et al and Rajput et al.^[10]

In the rural women, the study pointed out relationship between SIL incidence and increasing parity. In fact, 2028 (68.7%) of the total 4949 women studied were multiparous and the SIL was seen in 356 of them (17.5%). Multiparity as risk factor of cervical cancer has also been stressed in their rural findings by Rajput et al, Das Gupta et al^[11] and

Ray Chaudhuri et al^[12]. However, the adolescent girls (16-20 years) and postmenopausal women where the SIL rate was higher with nulliparity (20.9% and 30% respectively) showed reverse trend with increasing parity.

Mostly all the investigators in the field have emphasized the impact of early sexual activity as potential risk factors of carcinoma cervix. Since in rural India, the marriages at an early age is very common and hence the girls are exposed to the prolonged sexual exposure in their life time. It may be the cause of high SIL rate noticed by us in the adult girls between 21-30 years and adult women between 31-40 years. We have discussed in detail this point in our recent communication on the problem of early marriage in rural India and its subsequent ill effects.^[13] This point has also been emphasized by Iyer et al^[14] and Caslelda- Iliquez et al.^[15] Green et al have correlated early age at the first sexual intercourse and subsequent child birth with risk of carcinoma cervix.^[16] Dietsch et al have also seen CIN peak in 20-24 years age groups but the risk of cervical cancer increases in women above the age of 50 years.^[17] Lulla et al have also considered age at marriage and years of marriage life and parity significant risk factors for carcinoma cervix.^[18]

The present study was planned to see the role of age and parity or cumulative effect of both in the development of cervical cancer in rural women of India. As pointed out before, the SIL incidence was higher with young age between 21-40 years who were mostly symptomatic. The multiparity was also found as risk factor in the above mentioned young age group of 21-40 years. However, reverse trend was seen in the adolescent girls and postmenopausal women where SIL rate was higher with nulliparity and declined with increasing parity.

Hence, the findings obtained from the present rural study indicates the necessity of following parameters to be essentially followed while organizing a rural cervical cancer screening program-

a. All the young and adult women between the age of 21-40 years must be included in the screening especially if they are symptomatic.

b. All the nulliparous adolescents and postmenopausal women who have not conceived in their life must be cytological screened for any premalignant changes in the cervix and should be adequately treated for primary infertility

c. All the multiparous women belonging to the young population of 21-40 years must be examined to see the impact of high parity on the cervix. Further, this should be advised to adapt some Family planning methods to control the birth rate and restricting the birth of their children to 2 or maximum to 3.

All the above suggestions if implemented, it is hoped, will yield fruitful results in a screening program by detection of large number of SIL cases, the adequate treatment of which will check any progression of the lesions and will thus reduce the incidence of the carcinoma cervix in the rural population screened.

REFERENCES

- [1] Dietsch E, Gibb H, Francis K. ABNORMAL PAP TEST RESULTS AND THE RURALITY FACTOR. Australian Journal of Rural Health. 2003;11(2):50-56. Available from: <https://dx.doi.org/10.1046/j.1440-1584.2003.00464.x>.
- [2] Misra JS, Srivastava AN, Zaidi ZH. Cervical Cytological Changes Associated with Prolonged Sexual Exposure due to Early Marriage in Rural India. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH. 2020;2020(1):6-10. Available from: <https://dx.doi.org/10.7860/jcdr/2020/42757.13412>.
- [3] Srivastava M, Srivastava OP, Jaiswal SS Pattern of cervical smear cytology in a rural medical college. Pravera Med Rev. 2011;p. 31-35.
- [4] Lulla M, Khan S, Garud M. Socio-economic profile of women with cervical dysplasia. J Obstet Gynecol India. 1980;30:359-64.
- [5] Iniguez MS, Toledo CR. Risk factors for cervico-uterine cancer in women in Zacatecas. Salud Publica Mex. 1998;40:330-338.
- [6] 5-Hildesheim A, Herrero R, Castle PE. et al HPV co-factors related to the development of cervical cancer: Results from a population-based study in Costa Rica. Br J Cancer. 2001;84:1219-1245.
- [7] Misra JS, Srivastava AN, Singh U. Risk factors and strategies for control of carcinoma cervix in India: Hospital based cytological screening of 35 years. Ind J Cancer. 2009;46(2):155-159.
- [8] Green J, de Gonzalez AB, Sweetland S, Beral V, Chilvers C, Crossley B, et al. Risk factors for adenocarcinoma and squamous cell carcinoma of the cervix in women aged 20-44 years: the UK National Case-Control Study of Cervical Cancer. British Journal of Cancer. 2003;89(11):2078-2086. Available from: <https://dx.doi.org/10.1038/sj.bjc.6601296>.
- [9] Solomon D, Davey D, Kurman R, Moriarty A, O'Connor D, Prey M, et al. The 2001 Bethesda System: Terminology for Reporting Results of Cervical Cytology. Obstetrical & Gynecological Survey. 2002;57(8):505-507. Available from: <https://dx.doi.org/10.1097/00006254-200208000-00015>.
- [10] Iyer SS, Shah SK. Colposcopy as diagnostic aid in unhealthy cervix. J Obstet Gynaecol India. 1981;31:495-503.
- [11] Walboomers JMM, Jacobs MV, Manos MM, Bosch FX, Kummer JA, Shah KV, et al. Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. The Journal of Pathology. 1999;189(1):12-19. Available from: [https://dx.doi.org/10.1002/\(sici\)1096-9896\(199909\)189:1<12::aid-path431>3.0.co;2-f](https://dx.doi.org/10.1002/(sici)1096-9896(199909)189:1<12::aid-path431>3.0.co;2-f).
- [12] Raychaudhari S, Mandal S. Sociodemographic and behavioural risk factors for cervical cancer and knowledge, attitude and practice in rural and urban areas of North Bengal, India. Asian Pac. J Cancer Prev;2012(4):1092-1096.
- [13] Rajput N, Verma YS, Ahirwar G. 'DETECTION OF ABNORMAL CERVICAL CYTOLOGY BY PAP'S SMEAR AND COMPARISON BETWEEN RURAL AND URBAN WOMEN'. Journal of Evolution of Medical and Dental Sciences. 2013;2(41):7923-7930. Available from: <https://dx.doi.org/10.14260/jemds/1396>.
- [14] Badwe DA, Dixit R, Laversanne M, Bray F. Cancer incidence trends in India. Jpn J Clin Oncol;2014(5):401-407.
- [15] Bosch FX, Manos MM, Munoz N, Sherman M, Jansen AM, Peto J, et al. Prevalence of Human Papillomavirus in Cervical Cancer: a Worldwide Perspective. JNCI Journal of the National Cancer Institute. 1995;87(11):796-802. Available from: <https://dx.doi.org/10.1093/jnci/87.11.796>.
- [16] Franco EL. Cancer Causes Revisited: Human Papillomavirus and Cervical Neoplasia. JNCI Journal of the

National Cancer Institute. 1995;87(11):779–780. Available from: <https://dx.doi.org/10.1093/jnci/87.11.779>.

- [17] Gupta D, Naskar A, Ram NN, Deb R, S. A community based study of the prevalence of risk factor of carcinoma cervix in married women of rural area of West Bengal. *Ind J Commun Med*;2012(3):36–39.
- [18] 8-Nikumbh DB, Nikumbh RD, Dombale VD, Jagtap SV, Desai, Cytology. Clinicopathological and social aspect of cervical cancer screening in Rural Maharashtra. *India Int J Health Sci Res*;2012:125–132.

AUTHOR BIOGRAPHY

Jata S Misra, Ph.D Cytologist, Department of Pathology, Era's Lucknow Medical College and Hospital, Era University, Lucknow, (Uttar Pradesh), India

Anand N Srivastava, M.D Director Research, Era's Lucknow Medical College and Hospital, Era University, Lucknow, (Uttar Pradesh), India

Zeeshan H Zaidi, Ph.D Assist. Prof. , Department of Community Medicine, Era's Lucknow Medical College and Hospital, Era University, Lucknow, (Uttar Pradesh), India