Impact of socioeconomic risk factors on carcinoma cervix: Hospital based pap smear screening of 2 years in Bihar

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Abstract

Introduction: Cervical cancer is leading cause of cancer related morbidity and mortality in Indian women with 123,000 new cases and 67,000 deaths annually. Various socioeconomic associated factors like Income, education, parity, early age at marriage and low awareness about risk factors and symptoms play contributory in initiation and progression from dysplasia to frank cervical carcinoma.

Aim: According to National Family Health Survey (NFHS) State fact sheet Bihar year 2015-16, National Census of India year 2011 and Annual Health Survey year 2012-13, various above mentioned socioeconomic associated factors etiological are highly prevalent in female population of Bihar leading to growing number of cervical cancer patients. This study was carried out in a 199 bedded zonal hospital in Bihar to assess the impact of these factors on routine screening cervical pap smears and correlate the findings.

Materials and Methods: Cross sectional study carried out by analysing 860 cervical pap smears at a 199 bedded hospital in Bihar from January 2015 to December 2017 with pre defined socioeconomic variables. Majority of patients were from low socioeconomic rural background.

Result: Result showed linear correlation all the above risk factors to development of cervical cancer other then level of formal education.

Conclusion: More awareness specific to cervical cancer is needed for effective control of cervical cancer. Also more access and effective implementation of cervical cancer screening programs nearest to rural patients and overall improvement in socioeconomic parameters will go a long way in reducing the burden of cervical cancer in developing countries.

Keywords: Cervical cancer awareness in Bihar, The bethesda system, Socioeconomic factors, Risk factors, Poverty, Illiteracy.

Introduction

Cervical cancer has become one of the most important preventable cause of morbidity, mortality and financial burden to modern society worldwide. GLOBOCON 2012 report estimated 528,000 new cases and 266,000 deaths due to cervical cancer annually. Around 85% of these cases were detected in developing countries. In India, cancer statistics reveal 123,000 new cases with 67,000 deaths with 5-year prevalence of 3,09,000 cases of cervical cancer.[1,2] Increasing incidence of cervical cancer in developing countries could be attributable to wide spread prevalence of various etiological and associated socioeconomical contributory factors like chronic human papilloma virus infection, iliteracy, high parity, poor hygiene, early age of marriage and first pregnancy and most importantly, lack of awareness of symptoms and delayed reporting to hospital due to social stigma.[2] Most of the patients reporting to Gynecology OPD are either not aware about various symptoms of cervical cancer like vaginal bleeding after menopause, vaginal bleeding during and after sex, persistent vaginal discharge, hematuria and in advanced cases, mass per vaginum.

Natural history of cervical cancer development follows stepwise progression from normal cervix to pre invasive intraepithelial lesions, carcinoma in situ and frank carcinoma and gives ample opportunity for early diagnosis, treatment and prevention. Various population based mass screening methods like cervical cytology by Pap stain, lquid based cervical cytology, automated cervical screening techniques, visual examination by applying acetic acid and lugol's iodine at affected area are available for peripheral health care facilities.[3] However, most commonly used method is cervical Pap smear study by 2001 The Bethesda System (TBS) because of its high sensitivity, cost effectiveness in identifying probable cases, ease of study and easy categorization of all suspected cases of cervical cancer.[4]

As per the National Family Health Survey (NFHS) State fact Sheet Bihar Year 2015-16,[5] National Census of India year 2011[6] and annual health survey year 2012-13,[7] Various above mentioned etiological factors are highly prevalent in female population of Bihar leading to growing number of cervical cancer patients. Around 85-90% of total population of Bihar lives in rural areas with effective literacy rate of 46.3%.About 41% rural women aged between 20-24 years get married before 18 years of age.[8] Total Fertility rate among rural women is 3.6 children per woman. Most of the rural women in Bihar do not get proper nutrition. According to NFHS 2015-16. Around 31.8 rural women in Bihar have Body Mass Index below normal (BMI<18.5kg/$m^{2)}$. Most importantly, only 12.1 % of women from Bihar aged 15-45 years have undergone examination of Cervix, out of which 12.3 % are rural and 10.9 % are urban.[9] Because of prevalence of these wide spread contributory factors causing cervical carcinoma, This cross-sectional study was carried out at 199 bedded

zonal hospital to correlate impact of socioeconomic risk factors like income, education, parity, awareness about symptoms and risk factors of carcinoma cervix in present scenario and spread awareness.

Materials and Methods

Retrospective study was carried out by analyzing 860 cervical Pap smears at a 199 bedded hospital in Bihar from January 2015 to December 2017. Majority of patients were from low socioeconomic and educational background with rural background. For all patients, different socioeconomic variables like level of income, level of education, parity and awareness about risk factors were noted. For this study purpose, level of income was divided in low, medium and high based on income, 10,000/per month, 10,000-30,000/per month and >30,000/per month respectively. Education level was divided in to illiterate and literate based on whether patient has received any formal education or not. There were no exclusion criteria. All smears were taken from Squamo-columnar Transition zone by conventional Ayre's Spatula by trained personnel, spread on glass slide and fixed with 95% Ethyl alcohol and stained with Pap stain. All smears were analysed for various age specific parameters between 21 yrs-70 yrs on continuous variable as per 2001 The Bethesda system of reporting of cervical Pap smears and data was analysed using microsoft excel 2010.

Results

All 860 Pap smears studied as per the Bethesda system, 2001 for reporting of cervical Pap smears (Table 1). Total 41 smears were found unsatisfactory for evaluation due to various reasons like >75% obscuring inflammation, hemorrhage and absence of minimum squamous cellularity of 8000-12,000 Squamous cells. Age specific analysis of data revealed 44.19% (380/860) were from 31-40 yrs age (Table 2). Mean age of patient was 38 yrs. Total 77.44% (666/860) Pap smears showed abnormal results including inflammation and epithelial abnormalities.

Table 1: The bethesda system of reporting Pap smear (2001)

Specimen Adequacy
Satisfactory/Unsatisfactory
General Categorization
Negative for Intraepithelial Lesion or Malignancy(NILM)
Epithelial Abnormality
Others
Interpretation/Result
NILM-Reactive cellular changes, specific or non specific inflammation
Epithelial cell abnormality
Squamous cells
Atypical Squamous Cells (ASC), can be of Undetermined Significance (ASC-US)
ASC-H
Low Grade Squamous intraepithelial lesion (LSIL)
High Grade Squamous Intrapeithelial lesion (HSIL)
Squamous Cell Carcinoma
Glandular cells
Atypical Glandular Cells(AGC)
Atypical Glandular Cells, favors Neoplastic
Endocervical Adenocarcinoma in situ
Adenocarcinoma
Others-Endometrial cells in a woman≥ 40 years of age

Abnormalities Negative for intraepithelial lesion or Malignancy (NILM) was reported in 90.23% (776/860) smears. Inflammation was seen in 72.44% (623/860) smears. Further analysis of these smears showed inflammation due to Trichomonas Vaginalis, Candida and non specific inflammatory changes. Reactive changes due to inflammation and intra uterine contraceptive device were seen in 17.79 % (153/860) smears. Out of all smears, 5.0% (43/860) showed various Epithelial abnormalities including Low grade Squamous Intraepithelial Lesion (LSIL) and High Grade Intraepithelial lesion (HSIL). No cases of frank squamous cell carcinoma, atypical glandular cells or adenocarcinoma were reported. Maximum patients showing epithelial abnormality were from 31-40 years (Table 2).

Table 2: Age wise distribution

S No	Age (in yrs)	Number of cases	Percentage (%)
1.	21-30	153	17.79
2.	31-40	380	44.19
3.	41-50	218	25.35
4.	51-60	86	10.00
5.	61-70	23	02.67
	Total	**860**	**100**

Table 3: Incidence of various pathology (n=860)

S. No	Category	Number of Cases	Percentage (%)
1.	Negative for Intraepithelial Lesion or Malignancy (NILM)	776	90.23
	a) Reactive Cells	153	17.79
	b) Inflammatory Smears	623	72.44
2.	Epithelial Abnormality	43	5.00
3.	Unsatisfactory for Evaluation	41	4.77
	Total	**860**	**100**

Table 4: Distribution of abnormal cases on Socio-economic status (n=666)

Socioeconomic Variable	Total No of Cases	Total Percentage of cases (%)
i) Place of residence		
Rural	511	76.73
Urban	155	23.27
ii) Income		
Low	445	66.81%
Middle	173	25.98%
High	48	7.21%
iii) Parity		
Nulliparous	58	8.71%
Parity<2	208	31.23%
Parity>2	400	60.06%
iv) Level of Education		
Illiterate	180	27.02%
Literate	486	72.98%
v) Awareness about risk factors and Pap smear examination		
Aware	67	10.06%
Not aware	599	89.94%

Discussion

Annually 80% of new cases of cervical cancer are diagnosed in developing countries like India. With around 1.7 million prevalent cases and 5-13 million women with precancerous lesions, cervical cancer has become one of the most common preventable cause of cancer related morbidity and mortality in developing world.[1,2,9,10]

Although chronic infection with HPV is the main etiological factor, various other socioecomonic factors also contribute to initiation of dysplasia and progression to cervical carcinoma.

(a) Age- In our study, maximum number of cases were seen in 31-40 years of age. In various other studies done by Sunita et al,[11] Mandakani et al[12] and P Vijaya Lakshmi et al,[13] the maximum age of patients was 31-50 years of age and correlated with progressive rise in incidence of dysplasia and carcinoma with increasing age.

(b) Parity- In our study, around 60% of abnormal smears were from women with more then children. Misra et al[14] and Goes et al[15] also reported progressive rise in incidence of cervical cancer with increased parity. Multiparity causes repeated cervical trauma causing squamous metaplastic changes which is a strong risk factor for development of cervical cancer. Another possible mechanism is increased endogenous estrogen production during repeated pregnancy causing persistence of HPV infection by synergizing the effect of HPV oncoproteins and down-regulating cell mediated immune response progressing to dysplasia and carcinoma.

(c) Income-In our study, majority of the patients,66.81% were from low income category. In Bihar, seasonal agriculture is the main source of income and most of people from rural area work as daily wage worker with no fixed source of income. Poverty has a cascading effect on their lives leading to malnourishment, poor hygiene and sanitation, low immunity, low female literacy and poor access to healthcare facility. Studies conducted by Misra et al[14] and Zhang et al[16] and showed strong association between poor genital hygiene and cervical carcinoma. According to one study,[17] there is 100% increase in incidence of cervical cancer and 60% increase in incidence of dysplasia and carcinoma in situ.

(d) Education and Awareness about risk factors – In our study, one surprising finding was high percentage of literate patients (73%) with proper formal education but without any awareness about risk factors and symptoms of cervical cancer. These patients were also not aware by Pap smear examination for cervical cancer. This can be attributing to growing positive change in environment about formal education to female child in society but more stress is needed on specific education and awareness about cervical cancer in particular to reduce its prevalence and to make earlier diagnosis.[9] One aspect seen in our study related to Pap smear screening was non availability of effective screening program at remote rural areas. In present scenario, best modality to reduce growing incidence of cervical cancer in rural low socioecomic strata areas is by effective implementation of preventive measures like. Cervical screening programs by either visual inspection of cervix, application of Lugol's Iodine or by Pap smear examination at point of first contact with patients, social awareness programs at schools and colleges and more involvement of State Health department.

Conclusion

Increasing incidence of cervical dysplasia and invasive cervical cancer can be prevented by spreading awareness about various socioeconomic and etiological contributory factors. All these factors causes development of dysplasia and progression to cervical cancer. In our study, cases with rural background with Low income, high parity and less awareness about risk factors had higher number of abnormal smears despite high literacy levels. This stresses the need for more social awareness specific to cervical cancer, literacy, provision of safe and adequate water for hygiene and effective family planning. Stressing the need for Improvement in these factors, especially in rural areas can go a long way in reducing burden of cervical cancer in developing countries.

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