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A Case Control Study on the Risk Factors of Cervical Cancer among Women in a Coastal City of South India

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Abstract: ***Background: Cervical cancer is one of the major leading causes of death among women globally and majority of the cases are from developing country. India, which has one sixth of the world population, bears one fifth of the world burden of the disease. Despite being a preventable disease, cervical cancer claims the lives of almost half a million women worldwide each year. Objective: To study the profile of cervical cancer patients and to estimate the strength of association of the most contributing risk factors to cervical cancer. Methodology: A case control study was carried out and random sampling was done to select cases and controls. A total number of 51 subjects, which comprises of 26 cases and 25 controls was included in the study. The study was conducted in 3 hospitals in Mangalore namely Government Wenlock Hospital, Lady Goshen Hospital and KMC Attavar Hospital. Data was collected by means of semi-structured questionnaires, and analyzed using SPSS version 11. Results: The following parameters were identified as risk factors of cervical carcinoma with accordance of strength of association are personal hygiene (p=0.001 for washing vagina after coitus, p=0.012 for daily bath), multiparity (p=0.012), menopausal status (p=0.016), addiction to tobacco (p=0.21) and low socioeconomic status(p=0.25) has been found. Conclusion: Being one of the preventable leading causes of deaths among women, it is important to identify the risk factors associated with cervical carcinoma in hope that preventive measures can be taken earlier to reduce morbidity and mortality among women due to the malignancy.***

Keywords: Cervical cancer, Cancer, Malignancy

1. Introduction

Cancer of the uterine cervix is one of the leading causes of cancer death among women worldwide. The estimated new cancer cervix cases per year are 500,000 of which 79% occur in the developing countries. Cancer cervix occupies either the top rank or second among cancers in women in the developing countries, whereas in the developed countries cancer cervix does not even find a place in the top 5 leading cancers in women.[1] Cervical cancer claims the lives of almost half a million women worldwide each year. India bears one fifth of the global burden of the disease. More than 130,000 new cases, roughly one-fourth of the global total are reported in India every year. In addition, it is responsible for 20% of all female deaths in India. [2]

India's National Cancer Control Program emphasizes the importance of early detection and timely treatment as they are the key to reduce the morbidity and mortality caused by cervical cancer. The most commonly used screening method is cervical cytology or better known as Pap smear. However, there is no screening program available in India and many Indian women lack both awareness about the disease and access to prevention and treatment facilities. Many risk factors are found to be a contributing factor in the development of cervical cancer but the strength of association may be characterized to different communities and environments. In a hospital based case control study conducted in Mali during 1994-1995, it was observed that personal hygiene and multiparity were important co factors for cervical cancer among women in Mali. [3] In 1998, a study done in Calcutta confirmed the association between early age at first coitus and cervical cancer in women with a low rate of sexual promiscuity and define the role of these risk factors in cervical carcinogenesis among rural Indian women. [4] Since the prevalence of cervical cancer in women in developing country has been on a rise. Studies on the risk factors of cervical cancer has been done in large scale. But a study on the most contributing risk factors of cervical cancer in Mangalore is planned to narrow the gap with the aim of list down all the risk factors and in the hope later that the intervention in each ascertained risk factors will reduce the incidence of cervical cancer. The Objective of the study was to estimate the strength of association of the most contributing risk factors to cervical cancer.

2. Methodology

This case control study was conducted among women visiting three teaching hospitals attached to Kasturba Medical College (KMC) in Mangalore, Karnataka, between the age group of 25-85 years old. The study sample (cases) comprised patients with carcinoma of uterine cervix, all of whom were confirmed by the specialist, and the diagnosis was confirmed by the histopathological examination at every instance. Women attending the same institutions for other minor medical compliants, female relatives of patients, women coming for minor gynaecological complaints (like leucorrhoea) and particularly women with negative histo pathological result of cervical cancer formed the control group (controls). Both groups were matched according to age groups. There were 26 women in the study group while the control group comprised of 25 women. A pre-determined structured questionnaire was prepared and tested. The investigator obtained information by the interview method from both the cases & controls. Pre-testing was done to

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validate the questionnaire. Data collected from the questionnaire includes age, religion, per capita income, family history of cervical cancer, obstetric and gynecology history, sexual and personal habit. The data was compiled, analyzed and interpreted with the help of a software package, SPSS version11. Associations between various study parameters and the risks of cervical cancer were determined by comparing each group separately with the control subjects. For each of the study factors, risk was estimated by calculating the odds ratio (OR) and p-value as approximation of the relative risk (RR).

3. Results

A total of 51 samples including 26 cases and 25controls were analyzed with respective to age, occupation, per capita income, parity, religion, personal hygiene, addiction to tobacco, menopausal status, age at 1st coitus, sexual partners, use of contraceptive pills, early menarche, and history of abortion

In this study more than half (53%) of the cervical cancer patients were aged between 45-54. The mean age of cases and controls were 50.6 and 45.4 respectively. 42.3% of the cases were found to have below normal BMI (body mass index) of <18.5. Majority of the controls were having normal BMI of 18.5-24.9. Education level between cases and controls were considerably different as 31% of cases were illiterate, compared to only 8% of illiteracy among the controls (Table No.1)

Personal hygiene i.e. washing vagina after coitus, is found to be the most significant factor contributing to cervical cancer with p-value of 0.001.This is followed by multiparty (> 2) with p-value of 0.012. The prevalence of cervical cancer is more in post menopausal women with p-value of 0.012. Low socioeconomic status and addiction to tobacco are also included among the major risk factors of cervical cancer with p-value of 0.025 and 0.021 respectively. (Table No.2)

Based on our study, other important risk factors such as age of first coitus, multiple sexual partners, use of oral contraceptive pills, early menarche and history of abortion were found to be statistically not significant.

Table 1: Socio-demographic characteristics of the study population

Characteristics		Cases (%) , n=26	Controls (%) , n=25
age (years)	25-34	1 (3.8)	2 (8)
	35-44	4 (15.8)	13 (52)
	45-54	14 (53.8)	7 (28)
	55-64	4 (15.8)	1 (4)
	65-74	2 (8)	1 (4)
	75-84	1 (3.8)	1 (4)
	mean age (±SD)	50.6±10.2	45.4±10.4
Religion	Hindu	19 (73)	13 (52)
	Muslim	4 (15)	5 (20)
	Christian	3 (12)	7 (28)
BMI	<18.5	11 (42.3)	2 (8)
	18.5-24.9	11 (42.3)	18 (72)
	25-29.9	4 (15.4)	4 (16)
	>30	0	1 (4)
	mean no (±SD)	19.7±4.1	23.1±3.7
Education	Illiterate	8 (31)	2 (8)
	Primary	8 (31)	6 (24)
	Secondary	8 (31)	8 (32)
	University	2 (7)	9 (36)

Table 2: Distribution of risk factors of cervical cancer among cases and controls

Risk factors	Case (%) n=26	Control (%) n=25	p-value
Addiction			
Yes	17 (65)	23 (92)	
No	9 (35)	2 (8)	0.021
Daily Bath			
Yes	22 (85)	13 (52)	
No	4 (15)	12 (48)	0.012
Parity			
≤2	4 (15)	11 (44)	
>2	22 (85)	14 (56)	0.012
Menopausal Status			
Premenopause	10 (38)	18 (72)	
Postmenopause	16 (62)	7 (28)	0.016
Occupation			
Professional	0 (0)	4 (16)	
Semi-professional	0 (0)	3 (12)	
Business	0 (0)	6 (24)	
Housewives	23 (88)	12 (48)	
Labourer	3 (12)	1 (4)	0.01
Wash vagina after coitus			
Yes	9 (35)	25 (100)	
No	17 (65)	0 (0)	0.001
Per capita income (Rs)			
<1000	10 (38)	3 (12)	
1000-4999	14 (54)	12 (48)	
5000-9999	2 (8)	9 (36)	
≥10000	0 (0)	1 (4)	0.025

4. Discussion

From our study, the risk factors namely personal hygiene, multiparity, menopausal status, low socio economic status and addiction to tobacco were found to be associated with occurrence of the malignancy with the strength of association as given above. This finding is in agreement with many studies conducted throughout the world.

Personal hygiene is found to be the most important risk factor for cervical carcinoma. The habit of taking regular bath and washing vagina after coitus were better practiced by controls compared to cases. This agrees with other studies where lack of particular care in cleaning genitals increase 5.6 times risk of cervical carcinoma. [5] The reason maybe attributed to the fact that poor personal hygiene favours transmission of human papilloma virus which is considered to be the important etiological agent of cervical carcinoma.

The study also shows multiparity is a significant factor of risk as number of births increases. Every cycle of pregnancy adds burden and insult to the female genital tract including cervix and this make the cervix more prone to metaplastic changes. Our result is comparable with study done on *Parity as a Risk Factor for Cervical Cancer* which states that there is pronounced association between parity with cervical neoplasia. [6] From our findings cervical cancer mainly affects women after their reproductive age group.

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Per capita income and occupational status were important parameters that differ significantly between cases and controls. This indicates that women of low socio-economic are at a higher risk of developing cervical cancer as these women have lack of awareness of the disease, have poorer personal hygiene and most of them were found to have an addiction towards tobacco chewing. Parallel to our findings is the result of case control study done on association of paan tobacco chewing and dietary habits with cervical carcinoma in Chennai. A close dependent direct association of paan tobacco chewing with cervical carcinoma was observed. [7]

5. Conclusion

Low socio-economic status is an important parameter that differs significantly between the cases and controls as risk factor for cervical cancer. It is stated that there is a pronounced association between number of births and cervical cancer.. The risk is increased with the increasing number of births. Poor personal hygiene, especially poor sexual hygiene shows strong relation to cervical cancer. Tobacco addiction in any form is a significant predisposing factor to cervical cancer. Menopausal status of the women supports the onset of cervical cancer.

On the other hand, other important risk factors namely younger age at first coitus, multiple sexual partners, and use of contraceptive pills, early menarche, and history of abortion which are also considered to be important risk factors of cervical cancer are found to be insignificant in our study. These factors are found more commonly in western countries as compared to India. This may be due to some limitations in our study. Extracting correct information on personal matters such as sexual life from women in Mangalore with conservative background is difficult. Besides, limited sample size and duration of study also contribute to this. Regular health check up and pap smear test for sexually active women above 35 especially those of high risk group, practice of good personal and genital hygiene, avoidance of early marriage, coitus and pregnancy, limitations of total number of pregnancy, and avoidance of tobacco are recommended to women for prevention, early detection and treatment of the disease.

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