RESEARCH ARTICLE

Significance of Blood Group and Social Factors in Carcinoma Cervix in a Semi-Urban Population in India

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Abstract

Background: To assess the significance of social factors as risk factors for carcinoma cervix and to determine the significance of blood group to prevalence of carcinoma cervix in a semi-urban population of Kolar, Karnataka, India. Materials and Methods: One hundred cases of carcinoma cervix were included in the study, along with 200 females of the same ages considered as controls. Case details were collected from the hospital record section regarding social factors and blood groups and the data were analyzed by descriptive statistical methods. Results: Blood group B showed the highest number of cases (55 cases) followed by blood group O (29 cases) in carcinoma cervix which was statistically significant (p<0.001). Age of marriage between 11 to 20 years showed highest number of carcinoma cervix cases (77 cases) and this also was statistically significant (p<0.001). Patients with rural background were 75 (p=0.112, odds ratio: 1.54), parity of more than or equal to two constituted 96 cases (p=0.006, odds ratio: 4.07) and Hindu patients were 95 in number (p=0.220, odds ratio: 1.89). Conclusions: Blood group B and age of marriage between 11 and 20 years were significantly associated with carcinoma cervix in our population. Region of residence, parity and religion presented with a altered risk for carcinoma cervix.

Keywords: Carcinoma cervix - blood group - social factors - Karnataka

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Introduction

Cervical cancer has been known to be the number one killer cancer of women in India. According to a study on hospital registry based study the incidence of cervical cancer in this part of Karnataka is 17% of total cancer in females (Kalyani et al., 2010). It is recorded to be responsible for 10% of total cancer deaths in females in India (Satija, 2012). A study on cervical cancer is very much required to allow effective control and prevention on this deadly cancer. According to literature various socio-economic factors like low to middle income group, rural population, early age of marriage and increased parity is known to be risk factors for carcinoma cervix (Satija, 2012). Two studies have shown that cervical cancer is highly prevalent among individuals of blood group A along with a weak association with blood group B (Schroder, 1955; Kaur et al., 1992). Other studies found no significant relation of blood group to the occurrence of carcinoma cervix (Mittal, 1970; Adelusi, 1977).

The aim of this study is to reassess the significance of social factors as the risk factors for carcinoma of cervix and also to determine the significance of blood group to prevalence of carcinoma of cervix.

Materials and Methods

A retrospective study was done recruiting 100 cases of carcinoma of cervix diagnosed in Pathology department and treated in the Department of Obstetrics and Gynecology for the past 2 years in RLJ Hospital and Research Centre. 200 cases comprising of females of same age groups but free of cancer was included as control population.

The data regarding social factors like religion, region of residence, age of marriage, parity and blood group was collected from the case files maintained in the hospital records section. The collected data was analyzed using descriptive statistical methods like proportions, mean and standard deviation. Significance of association between social factors, blood group and carcinoma of cervix was done using the chi-square test.

Results

The distribution of ABO blood groups in controls and carcinoma patient is shown in Table 1. Blood group B showed the highest frequency of 55%, followed by blood group O (29%) in patients, whereas blood group O showed

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Table 1. The ABO Blood Group Distribution in Carcinoma Cervix Patients and Controls

		Test	Control	%
Blood group	AB	4	26	13
	A	12	34	17
	B	55	62	31
	O	29	78	39
Total		100	200	100

*χ^2=18.2; Degrees of freedom=3; p<0.001

Table 2. The Age of Marriage Distribution in Carcinoma of Cervix Patients and Controls

		Test	Control	%
Age of Marriage	≤10	10	3	1.5
	11-20	77	99	49.5
	21-30	11	94	47.0
	≥31	2	4	2.0
Total		100	200	100

*χ^2=44; Degrees of freedom=3; p<0.001

Table 3. Distribution of Region of Residence in Carcinoma Patients and Contorls

		Test	Control	%
Region	Rural	75	132	66
	Urban	25	68	34
Total		100	200	100

*χ^2=2.52; Degrees of freedom=1; p=0.112; Odds ratio=1.5455; 95%CI 0.9015-2.6493

Table 4. Distribution of Parity among Cancer Patients and Control Groups

		Test	Control	%
Parity	≥2	96	171	85.5
	1	4	29	14.5
Total		100	200	100

*χ^2=7.51; Degrees of freedom=1; p=0.006; Odds ratio=4.0702; 95%CI 1.3893-11.9241

Table 5. Distribution of Religion among Cancer Patients and Controls

		Test	Control	%
Religion	Hindu	95	182	91
	Islam	5	18	9
Total		100	200	100

*χ^2=1.51; Degrees of freedom=1; p=0.220; Odds ratio=1.8791; 95%CI 0.6766-5.2185

highest frequency (39%) in controls, followed by blood group B (31%). χ^2 test showed a value of 18.2 with a p value <0.001, showing statistically significant association between blood group B and the distribution of cases.

Table 2 shows the distribution of age of marriage among carcinoma patients and controls. Age of marriage between 11 and 20 years showed highest frequency of 77%, followed by age between 21 and 30. Controls group also showed a higher frequency for age group 11 and 20 years, followed by age group 21 and 30 years. The χ^2 test showed a value of 44, p value <0.001 with degrees of freedom=3. So, the association between age of marriage and the distribution of cases was statistically significant.

Table 3 shows the distribution of region of residence among cancer patients and controls. Cancer patients were 75% from rural and 25% from urban. For controls, 132 were from rural (66%) and 68 are from urban (34%). χ^2 test did not show any statistically significant association. However, odds ratio showed, those from rural region had a 1.5 times higher carcinoma occurrence.

Table 4 shows the parity of cancer patients and controls. For carcinoma patients, 4 cases were unipara while 96 cases were multipara. Controls showed 29 cases of unipara (14.5%) and . 171 cases of multipara (85.5%). χ^2 test did not show any statistically significant association. Odds ratio on the other hand showed that multipara women has a 4 times higher chance of developing carcinoma cervix.

The data on distribution of religion among the patients and controls are outlined in Table 5. Among cancer patients, 95 cases were Hindus and 5 cases were Muslims. Control population consisted of 182 Hindus (91%) and 18 Muslims (9%). No other religion was recorded. The distribution was not statistically significant by χ^2 test. Odds ratio showed a relative increased risk of 1.88 times for Hindu patients.

Discussion

In 1921, Alexander first observed that blood group B and AB are more susceptible to various forms of neoplasm, while blood group O appears to be more stable and resistant (Alexander, 1921). One study showed a strong association between malignancy of the uterus with blood group A, and a weaker association with blood group B (Schroder, 1955). Another study found a relatively strong association between carcinoma of cervix and blood group A, with a weaker association with blood group B (Kaur et al., 1992). Johannsen showed that higher incidence of carcinoma cervix with blood group A is not statistically significant (Johannsen, 1927). On the other hand Tyagi et al found that AB blood group has a statistically significant higher risk compared to the stable blood group O in relation of carcinoma cervix (Tyagi, 1967). In a study at Jamaica, cervical dysplasia/carcinoma was highly associated with blood group O compared to blood groups A, B or AB (Vaillant et al., 2013). In a study cervix cancer showed almost similar frequency of blood group B and O followed by A. However yet another study revealed a lack of association between ABO blood groups and patients with cancer of the cervix (Sharma et al., 2007). Our study found a statistically significant higher incidence of carcinoma cervix among blood group B patients. Although inconsistent with the work of other researchers, it is consistent with the work of Alexander (1921). Blood group A in our study showed relatively low incidence, even lower than that of blood group O. There may be some association between cervical carcinoma and blood group, but there is no clear explanation about it. However it is reported that the ABO blood group antigens are expressed at low levels in normal cervical tissues with the presence of an A-like antigen in cervical tissues and suggested that persons with blood group A and AB, lacking anti-A antibodies are more susceptible to cervical carcinoma (Vaillant et al., 2013).

Regarding age of marriage, women married between the age of 11 and 20 years were found to have a significant relation with the distribution of carcinoma cervix. Age of marriage generally reflect the age of first intercourse. One study shows that those having intercourse before age of 17 years have an odds ratio of 1.41 while those having intercourse between age of 17-20 years have an odds ratio of 1.12 compared to that of age 21 or more (Satija, 2012) . Early age at first intercourse was associated with increased risk of both squamous cell and adenocarcinoma of cervix although the association was stronger for squamous cell carcinoma (Berrington de Gonzalez A, 2004). The age at first intercourse is reported to be a relatively strong independent risk factor for both adenocarcinoma and squamous cell carcinoma and women with an age at first intercourse of 17 years or less had a 2–3-fold higher risk of cancer than those with first intercourse at 20 years or older (Green et al., 2003). Hence we can conclude that early age of intercourse significantly increase the odds of acquiring carcinoma cervix.

For region of residence, some suggest that carcinoma cervix is a disease of poverty, and found that women in rural area have a higher mortality rate than that of urban women (Mejía et al., 2003). An increased risk of approximately 100% between high and low social class categories for the development of invasive cervical cancer is reported, and an increased risk of approximately 60% for dysplasia, including carcinoma *in situ*. These differences was observed in all countries, however it was stronger in low/middle income countries and in North America than in Europe. No clear differences were observed between squamous cell carcinoma and adenocarcinoma, or between younger and older women with respect to social class. This indicate the possibility of increased susceptibility of cervical infection with human papilloma virus (HPV) which is linked to both female and male sexual behaviour, Our study found a relatively increased risk for those residing in rural area, compared to that of urban area. Rural residency was suggested to have lower education, low income, which in turn leads to low awareness towards hygiene, knowledge of cervical carcinoma, its screening programmes, difficult in persuading women for screening, leading to a delayed diagnosis and increased mortality (Kakuet al, 2008; Damiani et al., 2012). One study showed that women in the middle social class group were at approximately a 26% increased risk of cervical disease than women in the lower social class group who are at 80% increased risk when compared to women in the upper social class group. Lifestyle factors being the primary cause of the social class differences which emphasise the future cervical cancer prevention programmes to includes vaccination and screening especially for women from low socioeconomic groups so that they benefit best (Parikh et al., 2003).

Our study observed that women with more number of children (multipara) have a relatively higher odds ratio than that of unipara, although not statistically significant. The odds ratio showed an alarming increased odds ratio of 4.07 for multipara women. One study showed that women with 3 or more births showed 1.51 increased odds ratio to carcinoma cervix (Satija, 2012). Again, this reinforced the conventional claim that multipara women are more prone for carcinoma cervix. Both adenocarcinoma and squamous cell carcinoma has relation to parity of three or more (Berrington de Gonzalez A, 2004). However another study shows that adenocarcinoma risk was associated with early age at first birth but not with parity (Green et al., 2003).

Religion on the other hand, showed an increased risk for Hindu patients by 1.88 in this study. This is in consistent with the study of Jha AK et al, which showed 92% Hindu population in 471,000 cases studied (Jha et al., 2009). However, this may only be due to the fact that majority in Indian population are Hindus (80.5%) followed by Muslims (13.4%) (Censes of India, 2011).

In conclusion, to conclude, this study showed that blood group B and age of marriage between 11 and 20 years were significantly associated with carcinoma of cervix. The other parameters like region of residence, parity and religion, although did not show significant association, presented with a relatively higher risk for carcinoma cervix. With this information, specific strategies should be developed to target the high risk groups with preventive screening programmes and early diagnosis. Education strategies should be done to raise awareness regarding the risk factors of cervical cancer so as to reduce the incidence of this deadly disease.

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