RESEARCH COMMUNICATION

Community-based Screening of Cervical Cancer in a Low Prevalence Area of India: A Cross sectional Study

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Abstract

Cervical cancer is the second most common cancer of women in the world. The disease is amenable to various screening tests of which cytological screening by the Papanicolaou technique remains the mainstay for mass screening. The aim of the present study was to establish the prevalence of cervical cancer in a rural ethnically Muslim community of state of Jammu and Kashmir in India. For this, a community based screening for cancer cervix was conducted on married women aged 20-65 years. Following provision of information to promote awareness of the Papanicolau smear and its role in prevention of cervical cancer, 270 women were screened for cancer cervix by the conventional technique. Of the 270 subjects, the majority were married before 19 years of age (81.1%) and 42.5% delivered their first child within 1-2 years . Multiparity was seen to the tune of 51.3 %. There was no evidence of cervical dysplasia or cancer cervix among the screened population. Despite the presence of risk factors of high parity, early age of marriage and early childbirth after marriage, absence of cervical dysplasia and malignancy emphasizes the fact that socio-cultural factors, like absence of promiscuity and male circumcision, play an important role in the low prevalence of cancer cervix.

Key Words: Cancer cervix - pap smear - screening - low incidence Kashmir, India - prevention

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Introduction

Cervical cancer is the most common cancer in developing countries and the sixth most common in developed countries (De Sanjose et al., 1997). In India cervical cancer is the second most common cancer among women. In 2007 the estimated number of new cases according to national cancer registry of India was 90,708 with 5-year survival rate of about 48% (Nandakumar et al., 2009). It is estimated that in India 126,000 new cases occur each year (Sankaranarayan et al., 2003).

The predominant risk factor for cervical cancer is persistent infection with a high-risk oncogenic type of Human papilloma virus (types 16, 18, 31, 33, 35, 42, 55, 58). Malignant transformation by human papilloma virus (HPV) is influenced by several factors such as HPV virus type, co-infection with multiple oncogenic virus types and high viral load. Host factors like parity, early age of sexual activity, poor socio-economic status and sexual promiscuity are important contributory factors (Rolkin et al., 1967; Keighly et al., 1968; Graaff et al., 1977; De Sanjose et al., 1996).

Fortunately, the natural history of cervical cancer is such that it is possible to detect it early during a preinvasive curable stage by screening and early intervention, thereby preventing progression into a life threatening illness (Radha et al., 1992). Despite this fact, 75% of women in India present to the health facility in advanced stages of the disease (Ikram et al., 2005) .Various methods of screening available include Papanicolaou smear (cytological screening), Visual inspection method using acetic acid (VIA) and Lugols iodine (VILI) and HPV – DNA testing (Bhatla et al., 2007). However, it is well established in literature and clinical practice that the best method for early detection of precancerous lesions of cervix is cytological examination by Pap smear (Papanicolaou et al., 1949). Pap smear method with sensitivity of 72% and specificity of 94% is suitable for population based screening programme (Coste et al., 2003).

The present study was conducted with the aim of finding the prevalence of cervical cancer and other reproductive morbidities in currently/ ever married, women aged 20-65 years in an unscreened rural population with risk factors of early marriage and high parity. This is the first community based screening done for cervical cancer in Kashmir- an ethnically Muslim population . The study was conducted in collaboration with gynaeco- oncologists from Gujarat Cancer Research Institution Ahmadabad.

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Table1. Characteristics of the Screened Population

		Number	Percentage
Age in years (n=270)	20-29	60	22.2%
	30-39	101	37.4%
	40-49	58	21.4%
	50-59	30	11.1%
	≥60	21	7.7%
Age at marriage	≤19 years	220	81.1%
	20-24 years	34	12.5%
	≥25 years	16	5.9%
Time of first delivery after marriage	<2 years	125	46.3%
	2-4 years	69	25.5%
	>4 years	43	15.9%
Abortions		1	0.3%
Not remembering		28	10.3%
Not conceived		4	1.4%
Parity (n=265)	<3	57	21.5%
	≥3	208	78.4%

Materials and Methods

A cross sectional study was conducted at a community health center of block Ganderbal (A notified area committee), of district Srinagar of Jammu and Kashmir with a total population of 88,511. Prior to screening, intensive educational campaigning about cancer cervix and screening by pap test was done through mass media in the adjoining nine localities of the block catering to total population of 14,880 with 2083 women belonging to 20 to 65 years age group. Women in the community were sensitized by the health workers and encouraged to seek screening. Non pregnant women in the age group of 20 to 65 who were currently or ever married were motivated for screening by paying house-to-house visits also. Out of 2083 eligible women, only 286 women attended the health center, of which 16 did not consent for gynecological examination because of awkwardness associated with the test and invasive nature of the test. Women who were menstruating at the time of the study were excluded from the study. Ultimately 270 women were screened. Screening was done over a period of three days.

After collecting information on presence of certain risk factors such as; age at marriage, parity, age at first pregnancy; two smears were collected one from squamo-columnar junction of cervix using Ayre spatula and the other from endocervix by endocervical brush. Two slides were prepared for each case. The smears were fixed in 95% ethanol and stained by papanicolaou technique. Per speculum and per vaginal examination was also performed. All the smears were transported to Gujarat Cancer Research Institution Ahmadabad for cytological examination as per programme protocol. In addition, the gynecologists of the health center and the visiting team from Gujrat also addressed reproductive health issues (menstrual irregularities, backache, and vaginal discharge) of all the females who attended the health center.

Results

A total of 270 currently/ever married, non-pregnant females in the age group of 20-65 years who underwent screening by conventional papanicolaou technique were included in the study. The response rate was 12.96% of the expected target population. Majority of the women were in the age group of 30-39 years (37.4%) and more than three fourth women (81.1%) were married before 19 years of age. 78.4% females were multiparous having three or more children. Early age at marriage was seen to be associated with multiparity (Table 1).

Table 2. Clinical Characteristics and Cervical Findings in the Screened Population (n=270)

Symptom	Number	Percentage
Backache	200	74.0%
Vaginal discharge	111	41.1%
Menstrual problems (menorrhagia, dysmenorrhoea)	76	28.1%
Pain during intercourse	11	4.0%
Asymptomatic	48	17.7%
Per speculum examination		
Cervicitis	39	14.4%
Hypertrophied cervix	5	1.8%
Cervix bleeding on touch	5	1.8%
Erosions	40	14.8%
Polyps	13	4.8%
Unhealthy cervix	25	9.2%

Table 3 Pap Smear Results

Findings	Number	Percentage
Dysplasia	0	0.0%
Inflammation	7	2.5%
Unsatisfactory smear	16	5.9%
Normal	247	91.4%

The gynecological symptoms reported by the females included low back ache (74%), vaginal discharge (41.1%), menstrual problems (37.9%) and painful intercourse (4%). Per speculum examination of the females showed cervicitis in 14.4%, cervical erosions in 14.8%. 9.2% had unhealthy cervix, 4.8% had cervical polyps and 1.8% each had hypertrophied cervix that cervix bleeding on touch (Table 2).

Cytological examination of the pap smears was reported as normal in 91.4%. Inflammation was seen in 2.5% and smears were reported as unsatisfactory in 5.9% of cases. None of the study subjects had evidence of cervical dysplasia or malignancy in the smears (Table 3).

Discussion

Cervical cancer is an important cause of morbidity and mortality among females worldwide, more so in developing countries. It is considered to be an ideal gynecological malignancy for screening as it meets both test and disease criteria for screening. It has a long latent phase during which it can be detected as identifiable and treatable premalignant lesions which precede the invasive disease, and the benefit of conducting screening for carcinoma cervix exceeds the cost involved (Rajendra et al., 2006). For screening of cervical cancer a battery of tests are available which include conventional exfoliative cervicovaginal cytology, liquid based cytology, automated cervical screening, neuromedical systems, HPV tests, polar probe, laser induced fluorescence, visual inspection

by using Lugols iodine / acetic acid, speculoscopy and cervicography (Cheryl et al., 2000). However for an organized population based screening programme, conventional cytology by Papanicolaou technique is considered to be the gold standard test as it satisfies the test criteria for a screening test; being simple, cost effective, safe, easy to perform, and valid (Rajendra et al., 2006). With its introduction, early diagnosis during the incipient stages followed by treatment has altered the course of disease in cervical cancer patients.

In the present study cytological screening for cervical cancer was performed in 270 women of age group 20 to 65 years from an ethnically Muslim population of Kashmir province (95% Muslims, Indian Census 2001), in a rural area of block Ganderbal which has female literacy rate of 37% (Indian Census 2001). It is the first study of its kind being reported from Kashmir.

Early age at marriage (< 19 years) was reported by more than three-fourth of screened population and 46.3% females had given birth to their first child within two years of marriage. Multiparity was reported among more than two-third females (78.4%). As expected 81.6% females who were married between age group of 15-19 years had more than three children. Early age at marriage was associated with high parity, indicative of early age at first sexual intercourse, which is considered to be one of the potential risk factors for cancer cervix. A number of case control studies have also investigated the role of age at first sexual intercourse, age at first marriage, and age at first pregnancy in the etiology of cervical cancer. The results have shown that these factors are highly interrelated with the increased risk of invasive carcinoma of cervix with significant risk ratio ($p< 0.001$) (Louie et al.,2009) . Observational as well as comparative studies have also identified increasing parity as one of the attributable risk factor for cervical cancer (Parazzini et al., 1990, Brinton et al., 1989).

Symptoms suggestive of reproductive tract infections were reported by the females, which included mainly backache (74%) and vaginal discharge (41.1%). Reproductive tract infection as a risk factor for cervical cancer has been evaluated by several studies. Some selected studies have identified genital tract infection as a poor predictor of risk for cancer cervix (Brinton et al., 1987). On the contrary a study conducted in India has reported positive association and found that there was equivalent increase in the proportion of women with cervical dysplasia as the incidence of symptoms suggestive of reproductive tract infections increased. The study concluded reproductive tract infection is exacerbated by poor genital hygiene which has a role in development of cervical dysplasia and cervical cancer (Cherian et al., 1999). Similarly, another Indian study has found infections of reproductive tract as one of the risk factor for cervical cancer (Aparajita et al., 2002).

Cytological examination revealed normal study in 91.4% smears, and inflammation in 2.5%. In 5.9% cases the results showed unsatisfactory smears. Studies on assessment of adequacy and quality of Pap smear results have shown unsatisfactory smear collection ranging from 0.49% to 7.8% in some studies (Adams et al., 2005; Amy et al., 2003). The high percentage of unsatisfactory smears in our study may be due to technical or observer error. An important observation was that none of the smears collected showed dysplastic change. This corroborates with the results from other studies conducted in Muslim countries across the world where low incidence of cervical cancer has been reported (Bhurgri et al., 2007, Howayada et al., 2007, Komoditi et al., 2005). A study conducted in a rural Muslim community in East Lebanon, reported 0% prevalence of invasive cervical cancer and 0.1% cervical dysplasia in females aged 15-60 years (Mary et al., 2003)

Moreover low prevalence of cancer cervix has also been reported among Muslims in India, which has the highest prevalence of cancer cervix in the world and has a substantial Muslim population (13.4%, National census 2001) (Jussawalla et al., 1985; Yeole et al., 2006) . The possible reason for absence of cervical dysplasia and cancer in the study population could be the socio-cultural and religious practices prevalent among the Muslim society, that include marked absence of promiscuity and compulsory male religious circumcision.

The present study, first of its kind in Kashmir, with a Muslim majority, provides an insight into the prevalence of cervical cancer in a hitherto unscreened Muslim community. Various risk factors, such as early age at marriage, early childbirth and multiparity were present at high frequency. The fact that these factors are only partially and not wholly responsible is indicative from the study on Egyptian women where early marriage and high parity still was still associated with a low prevalence of cervical cancer (Howayada et al., 2007).

Moreover it is well established fact that infection by oncogenic strains of Human Papilloma Virus is causative agent for most of the cervical cancers and factors such as early sexual activity (marital or pre marital), multiple sexual partners, multiparty are all known to increase the risk of HPV infection. Pooled data from case control studies on cancer cervix have shown significant evidence that male circumcision reduces the risk of HPV infection among men cervical cancer among women with high risk sexual partners (Castellsague et al., 2002). This is further supported by other studies (Kjaer et al., 1991; Boon et al., 2002)

In conclusion, despite the presence of risk factors, such as early age at marriage, early childbirth and multiparity, none of the screened subjects in this study showed evidence of either dysplasia or malignancy. This may be due to male circumcision and absence of risk factor like sexual promiscuity, both of which are directly related to acquisition of infection by oncogenic strains of human papilloma virus. However to substantiate the conclusion, a study to ascertain the presence of HPV infection in the same population with broader sampling frame is recommended.

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