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Evaluation of Human Papillomavirus Igg (Hpv-Igg) Infection in Patients with Cervical Cancer of Different Age Groups in Salem District, Tamil Nadu, India

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Abstract

The cervical cancer is by far the most common Human papillomavirus (HPV) infection related disease. Population-specific data on the age distribution of HPV infection and cervical cancer provide valuable information to help making cervical cancer screening an even more effective cancer prevention tool. Keeping in view, this study examined the HPV in cervical cancer patients of Salem district, with special attention to any relationship with the age distribution. In light of the findings in this study, the HPV infection in Adulthood women has been consistently observed in this study and the incidence of the cancer is very high in women above age of 35 years and older. The World Health Organization recommends screening for every woman between the ages of 35-59 years, at least once in a life time. Salem city health authorities should seriously consider and implement strategies to increase and maintain the Pap smear screening uptake in women aged between 35 and 59 years and older.

Keywords: Age, Cervical cancer, Human papillomavirus (HPV),

INTRODUCTION

The cervical cancer is by far the most common Human papillomavirus infection (HPV) related disease (Kumar *et al*. 2007). Human papillomavirus (HPV) is a non-enveloped deoxyribonucleic acid (DNA) virus belonging to the family Papillomaviridae. This family includes more than 130 geno-types, many of which infect the mucosal areas of the human upper digestive tract and the anogenital region through sexual contact, leading to increased risk of development of cancer (Touzé *et al*., 2001; Frazer, 2010; Ma *et al*., 2013). Risk factors associated with HPV infection include heterosexuality, promiscuity, smoking, high parity, early sexual debut, infection with other sexually transmitted diseases, prolonged use of contraceptives, dietary factors, and genetic disorders such as WHIM (warts, hypogammaglobulinemia, immunodeficiency, myelokathexis) syndrome (Nnodu *et al*., 2010; Okolo *et al*., 2010).

Infection with HPV diagnosed by detection of antibodies to HPV in the serum is the primary risk factor contributing to development of cervical intraepithelial neoplasia and invasive cervix carcinoma. Keeping in view, this study examined the HPV in cervical cancer patients of Salem district, with special attention to any relationship with the age distribution.

MATERIALS AND METHODS

Study design

The cervical cancer patients were adopted in this study and participants were recruited from a rural and urban area in Salem district, Tamil Nadu, Southern India. Eighty eight (88) women were selected using non-probability convenience sampling technique. The inclusion criteria were: i) those between the ages of 20 and 70 years ii) who were willing to participate in the study, iii) who were able to read, write and understand Tamil, the local language. Women who had been diagnosed of cervical cancer were excluded from the study. This study used a socio-demographic questionnaire on cervical cancer that were developed by the authors. The socio-demographic questionnaire consisted of nine items, which were regarding the participant's age, locality, educational qualification, occupation, habits, marital status, family history of any cancer or cervical cancer and

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stages of cervical cancer. Equal number of health control subjects were taken in this study.

Analysis of Human papillomavirus IgG (HPV-IgG)

Human papillomavirus IgG (HPV-IgG) analysed by sandwich enzyme-linked immunosorbent one-step process assay (ELISA) followed by manufacture instruction (QAYEEBIO for life science, China). The kit uses a double-antibody to assay the level of Papillomavirus IgG(HPV-IgG) Add standard, test sample and HRP-labeled Papillomavirus IgG(HPV-IgG) antibodies to enzyme wells which are Pre-coated with Papillomavirus IgG(HPV-IgG) antibody, then carry out incubation and wash to remove the uncombined enzyme. Upon adding Chromogen Solution A and B, the color of the liquid will change into blue, and the reaction with the acid will cause the color to become yellow. The depth of color and the concentration of the Papillomavirus IgG (HPV-IgG) sample are positively correlated.

Ethical considerations

This study received ethical approval from Institutional Ethics Committee, Government Mohan Kumaramangalam Medical College and Hospital, Salem. The women gave written consent for the study, prior to their participation. They were assured of confidentiality and were informed that they had the right to withdraw from the study at any time they wished to.

Statistical Analysis

The analysis involved a description of the sample according to the population variables. To analyze the differences in the mean was computed with a statistical significance level of $p<0.05$ using Chi- square test.

RESULTS

Table 1 shows the Human papillomavirus (HPV) analysis in cervical cancer patients. In the present investigation, the serum level of Human Papillomavirus IgG (HPV-IgG) in early adulthood for 61.56, adulthood for 64.44 and elderly for 55.31. The incidence HPV-IgG was 1.13% for early adulthood, 63.63% for adulthood and 35.22% for elderly.

Values are expressed as Mean ± SD, N=88. Data was calculated by Chi- square test statistically significant level 0.05, using SPSS ver. 20. $*P<0.05$ and NS non-significant ($^{NS}P>0.05$).

DISCUSSION

The human papillomavirus (HPV) is one of the most common causes of sexually transmitted disease in

Table 2 shows the Determination of HPV IgG in relation to Ages in women with cervical cancer

Characteristics	Number of cases	% of incidence	HPV IgG	*p* value
Early adulthood (20-34 y)	01	1.13	61.56±00.00*	5.9×10^{-12}
Adulthood (35-59 y)	56	63.63	64.44 ± 13.25^{NS}	
Elderly (60-70 y)	31	35.22	55.31 ± 9.76^{NS}	

both men and women around the world, especially in developing countries, where the prevalence of asymptomatic infection varies from 2 to 44%, depending on the population and studied region (Sanjosé *et al*., 2007). Most HPV infection is transient and some studies show that the majority of sexually active individuals are exposed to and acquire infection from this virus at some phase in their lives (Baseman and Koutsky, 2005; Trottier and Franco, 2006). HPV infection is more prevalent in young adults, at the beginning of their sexual activity, with a subsequent decline in the prevalence rate with increasing age, likely as a result of development of an immune response against the virus and reduction of sexual activity (Fernandes *et al*., 2009; Chan *et al*., 2010).

HPV can infect basal epithelial cells of the skin or inner-lining tissues and are categorized as cutaneous

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types or mucosal types. Cutaneous types are epidermotropic and infect the keratinized surface of the skin, targeting the skin of the hands and feet. Mucosal types infect the lining of the mouth, throat, respiratory, or anogenital tract epithelium (Burd, 2003). Some HPVs are associated with warts while others have been well established as the main risk factor of invasive cervical cancers and their associated pre-cancerous lesions (Clifford et al., 2005; Muñoz et al., 2006). However, only few HPV-infected individuals progress to invasive cervical cancer (Burd, 2003). Most infected individuals eliminate the virus without developing recognized clinical manifestation. (Bosch et al., 2008).

The global incidence of the cancer is very low in women under age of 25 years. The incidence of cancer increases at age of 35 to 40 years and reaches its maximum in women in their 50s and 60s. (PCCW, 2005). Vrede and Sabaio (1987) reported the 33.7% cases of cervical cancer in women aged 41 to 50 years, while Mans *et al.* (2003 and 2011) found no differences in cervical cancer incidence between women of 50 years and older and those aged 20 to 49 years. Sreedevi *et al*, (2015) reported peak age of occurrence of cervical cancer in India is between 55 and 59 years, and the highest age-adjusted rates are in Aizawl in the north eastern part of India at 24.3 per 100,000 women. In our study we observed that the peak age of cervical cancer occurrence was 35 to 59 years and the incidence of the cancer is very high in women above age of 35 years and older.

Vergese *et al* (1999) noted that increasing age, increasing parity, illiteracy and poor sexual hygiene were risk factors for cancer cervix. Indicators of poor hygienic conditions showed an especially strong effect. A direct role of poor hygienic conditions and menopausal status in cervical cancer has been reported. (Bayo *et al*, 2002). lliteracy, multiple sexual partners, sexual intercourse in young age, high parity, history of venereal disease is known to be risk factors for cervical cancer (Chichareon *et al*, 1998).

Conclusion

In conclusion, the HPV infection in Adulthood women has been consistently observed in this study and the incidence of the cancer is very high in women above age of 35 years and older. Population-specific data on the age distribution of HPV infection and cervical cancer provide valuable information to help making cervical cancer screening an even more effective cancer prevention tool. The World Health Organization recommends screening for every woman between the ages of 35-59 years, at least once in a life time. The screening interval (frequency) should not be less than 5 years (and not less than 10 years, if using an HPV test). In light of the findings in this study, Salem city health authorities should seriously consider and implement strategies to increase and maintain the Pap smear screening uptake in women aged between 35 and 59 years and older.

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