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MAGNITUDE OF HUMAN PAPILLOMA VIRUS INFECTION IN URINE SAMPLES FROM HUMAN IMMUNODEFICIENCY VIRUS INFECTED AND HUMAN IMMUNODEFICIENCY VIRUS NON INFECTED MALES

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ABSTRACT **Background:** Human Papilloma Virus(HPV) selectively infect the epithelium of skin & mucous membranes. HPV with intra epithelial dysplasia of the genital organ is twice as common in HIV(Human immunodeficiency virus) infected individuals as in the general population.

Methods: In the present study the detection of infection by HPV in HIV positive males and in HIV negative males in urine samples was compared by hybrid capture 2 testing. Fifty HIV positive male patients with CD4 count < 100 cells/c mm were included.

Results: Out of total 100 samples, 7/50(14%) for HIV positive males and 6/50(12%) for HIV negative male were positive for high risk HPV. The magnitude of HPV infection was high in HIV positive patients and detection of HPV in urine would offer a more accessible,non invasive and acceptable method to diagnose it.

KEYWORDS : HPV, HIV , Hybrid capture.

Introduction -

Human papillomavirus (HPV) selectively infect the epithelium of skin and mucous membranes. Papillomaviruses constitute the *Papilloma* virus genus of family Papillomaviridae.[1]More than 100 HPV types are recognised and individual types are associated with specific clinical manifestation.[2] HPV is a small DNA virus with a genome of approximately 8000 base pairs. They are non envoloped, measure 50-55 nm in diameter, have icosahedral capsids composed of 72 capsomeres, and contain a double-strand circular deoxyribonucleic acid (DNA). HPV's are also classified by the type of tissue they are preferably found in (cutaneous,mucosotropic, indifferently cutaneous or mucosotropic) but most importantly all HPV are classified by their capacity to trigger cancerous lesions[3] or not as high risk HPV (HR HPV) and low risk HPV (LR HPV) group respectively. The prevalence of genital HPV infection in men ranges from 1.3% to 72.9%[4]. There is growing evidence of a significant burden of HPV infection and associated disease in men. HIV infection increases HPV prevalence, incidence and persistence and is strongly associated with the development of ano genital warts and anal, penile and head and neck cancers in men. Prevalence of infection increases with declining CD4+ count. Hybrid Capture 2 is the most widely studied commercially available HPV assay and the majority of the evidence for HPV primary testing in population-based screening programs is based on the Hybrid Capture 2 assay.[5]

Materials and Methods:

Study Area and Site : This study was carried out in ART clinic of SMS Hospital and in Department of Microbiology,SMS Medical College and attached hospitals ,Jaipur (Raj.).

Study Design: It was a Hospital based cross sectional study.

Study Population : 50 HIV sero- positive patient attending ART clinic of SMS Hospital were included in the study and 50 HIV sero-negative patients attending different OPD at SMS Hospital were enrolled as control group in the study.

Inclusion Criteria : HIV positive males within an age group 20-50 years who attended ART clinic in SMS Hospital Jaipur with CD4 count <100 cells/ cubic mm and HIV negative males

Exclusion Criteria : Patients who were vaccinated against Human Papilloma virus and patients who did not give consent.

Sample collection: First voided Urine sample was collected by the patients himself, in sterile wide mouth disposable container under aseptic precautions.(6) The collected samples were sent earliest to virology laboratory for processing in Tri-Path imaging preservative fluid and stored at 2-8C and assay was performed within 1 week. Urine specimen was tested for HPV by DNA hybrid capture technique which could detect 13 HPV type namely 16,18,31,33,35 ,39, 45,51, 52,56, 58, 59 and 68. Hybrid Capture 2 is a nucleic acid hybridization assay with signal amplification using microplate chemiluminescence for the qualitative detection of thirteen high-risk types HPV DNA in urinary specimen.[7]

Observation and Results :

Total 100 samples were processed by hybrid capture 2 testing for HPV, out of which 7/50(14%) for HIV positive males and 6/50(12%) for HIV negative male were positive for high risk HPV. Most of HIV positive males were between 26-35 years of age group and HIV negative males were between 12-25 years of age group.Mean age of case group was 37.46±9.92 years and mean age of control group was 30.48±13.34 years. Incidence of HPV infection in the study group is maximum between 26-35 years of age group (46.15%).

Table - 1 Classification of HPV and HIV status in the study

HPV	HIV +ve	HIV-ve	Total
Present	07 (14%)	06(12%)	13(13%)
Absent	43(86%)	44(88%)	87(87%)

Table -2 Age wise distribution of HPV infection in the study group (n=100)

Age Group (years)	HPV+ve	%
12-25	4	30.78
26-35	6	46.15
36-45	3	23.07
46-55	-	-
56-71	-	-
Total	13	100

Discussion :

The estimates of HPV prevalence in the literature are highly variable , and it is difficult to decide whether such variability reflects methodological or population differences.[8] The 14% prevalence of HPV infection identified in our study is similar to previous data on HIV infection. [9]Many factors have been proposed to explain the high HPV prevalence in HIV positive subjects. [10]HIV infection could lead to an increased risk of reactivation of latent infections, and the persistence of HPV infection could be due to immune system dysregulation . Also the detection of HPV DNA from a urine specimen is low[11]. This could simply be due to the fact that urine samples contain relatively few cells as it is a diluted sample or that urine contains inhibitors of the hybrid capture.[12] Using urine as a sample for HPV DNA testing has a number of advantages. Urine can be included in a noninvasive self-sampling method. [13] Given that instances of discordant results for HPV DNA detection of the urine specimens may potentially be rectified by testing multiple urine specimens from the same patient, the urine assay merits further study to assess whether it may be an appropriate screening technique for HIV positive population.[14] We demonstrated that overall HPV prevalence was 13% in the present study. Some previous reports indicate that the prevalence of HPV infection in the male external genitalia in 17 to 70 year old men ranges from 1% to 84% among low risk men and from 2% to 93% among high risk men.[15] The immune system of the HIV positive men studied here is greatly impaired since these patients have a CD4 T cell count below 100 cells/mm3 .Immuno suppression may permit increased replication of what may otherwise have been a low-level, possibly undetectable HPV infection.[16] In this respect we found that the HPV DNA signals were much higher in the samples from HIV-positive than in those from the HIV-negative men, suggesting a higher viral load in HIV-positive men. HIV affects mainly the young and sexually active males.[17] This is borne out, in our study, by the different age distribution of cases of HPV infection among HIV infected and HIV noninfected patients. Maximum HIV patients were between 26-35 age group in our study. HPV infection is also maximum in this age group.[18] In contrast in HIV negative patients maximum HPV infection was present between12 -25 age group. In present study there is no statistically significant difference between the ages of HPV infection in HIV infected and HIV uninfected patients. This is consistent with the experience in other studies (Palefsky1998 et al,[19] Ching hong'2002 et al).[20] To better understand the natural history of HPV infection, its progression to benign and malignant disease in men, and to better inform the development and implementation of vaccination programs, more data are needed regarding the incidence and persistence of HPV at the different anatomical sites it infects, the incidence of external genital lesions, and the diversity of HPV types in these lesions.

Conclusion:

This study was done to assess the magnitude of HPV in urine samples from HIV infected and HIV non infected males at tertiary hospital in Rajasthan. We observed slightly higher prevalence of HPV in HIV positive males than in HIV negative males but difference was not statistically significant. In our study we also observed no role of low CD4 T cell count in HIV patients on ART. We observed that diagnosis of HPV infection is necessary in both HIV positive and HIV negative males. As HIV positive patients are immune suppressed hence they are more susceptible to HPV infections.So HIV positive patients must have strict policy for the diagnosis of HPV infection.[21] It is highly recommended to vaccinate males between 17-33 years of age group for preventing transmission of infection.It is also advisable to diagnose HPV infections in these patients at the earliest so as to minimize the risk of transmission of virus.[22]

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