

ORIGINAL ARTICLE

The incidence of human papilloma virus in pregnant women and the vertical transfer rate at vaginal delivery

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Abstract. *Objective:* Among 200 different genotypes of HPV at least 40 are related with anogenital diseases. HPV not only increases the risk of cervical and anogenital malignancies but also causes sexually transmitted infections in women in fertile period. In the past decades, the rate HPV infections have increased all over the world. The majority of infections are asymptomatic or presents with few small condylomas that can be ignored easily. It is clear that HPV infection is sexually transmitted, however there is lack of sufficient data about the fetomaternal transmission. The aim of this study is to determine the prevalence of Human Papilloma Virus (HPV) in Turkish society and to find the rate of the vertical transmission of HPV in the HPV positive mothers that give birth by vaginal delivery. *Subject and Method:* A total of 150 hospitalized women in full term with uterine contractions were enrolled in the study. Dacron swabs were taken from cervical canal of the hospitalized women and right after the delivery swabs were taken from the oro/nasopharynx of the babies. The samples were analysed by Digene Hybrid Capture HPV DNA assay. *Results:* Among 150 women, 8 had cesarean section for some reason and the remaining 142 women and their babies were evaluated for HPV positivity. Eleven pregnant women (7.7%) were HPV positive and none of the babies had HPV positivity. *Conclusion:* When the complications of HPV infection are considered, this rate of HPV positivity can create a high medical problem in the near future.

Key words: Human Papilloma Virus, Pregnancy, Vaginal birth, newborn infections

Introduction

Among 200 different genotypes of HPV at least 40 are related with anogenital diseases. HPV not only increases the risk of cervical and anogenital malignancies but also causes sexually transmitted infections in women in fertile period. HPV can be transmitted by direct contact (cutaneous type) or sexually (mucosal type) (1). By infecting basal epithelial cells in genital area the genome of HPV can stay intracellularly and cause recurrences (2). Active or latent infections of mucosal type HPV in cervix, vagina and vulva may eventually be transmitted to the baby by mucosal

contact during labor. There are strong epidemiological data about the sexual transmission of HPV among adult however, evidence suggests different routes of transmission from mother to newborn like passing from infected birth canal, hematogenous transmission, infection after premature membrane rupture or from infected sperm during contraception (3).

In the past decades, the rate HPV infections have increased all over the world. The majority of infections are asymptomatic or presents with few small condylomas that can be ignored easily. It is clear that HPV infection is sexually transmitted, however there is lack of sufficient data about the fetomaternal transmission.

In only one meta-analysis about the pregnant women and newborns, in one third of the infected newborns there was a vertical transmission (4,5). In the same meta-analysis, there was a wide range of variation in the rate of vertical transmission ranging from 0 to 80 % (5,6).

In this study we aimed to investigate the incidence of HPV in asymptomatic pregnant women and vertical transmission of infection to newborns.

Material and Method

A total of 150 term pregnant women admitted to our obstetric clinic for labor during the previous 9 months period were enrolled to our study. In the enrollment criteria were: no previous diagnosis of cervical dysplasia, intact amniotic membrane, lack of vaginal bleeding, cervical dilatation less than 6 cm and effacement smaller than 60%, term and vaginal delivery. Detailed story was taken from the patients including age, past medical history, presence of any sexually transmitted infection in the past. Women who had multiple partners, on narcotic drugs and who had a history of sexually transmitted disease were excluded.

Following genital inspection all pregnant women underwent speculum examination, the degree of cervical dilatation /effacement and any existing pathology were recorded. Using Dacron swabs cervical mucous and contaminations were removed and then with a second swab was used to take specimens from each wall of the cervix in a circular manner. The specimens were kept at -20 degree Celcius in deep freezer.

After the spontaneous vaginal birth preceding the nasopharyngeal aspiration to the newborn, using two separate swabs nasopharyngeal and an oropharyngeal specimens were taken and they were stored in -20 degree Celcius in deep freezer. Digene Hybrid Capture HPV DNA Assay /USA were used to study the specimens.

Results

When the risk factors are evaluated, among HPV infected women 1.3% were hepatitis B carrier,(Table1).

23,3% of the patients were between the ages of 16-20 years, 36% were 26-30 years and 15% were above 30 years of age. When 8 patients eventually had cesarean section they were excluded from the study and among the remaining 142 patients 11 (7.7%) had HPV positive specimens. No risk factor was found in common among the HPV positive mothers (Table3). The oropharyngeal and nasopharyngeal swabs of the HPV positive mothers were all negative.

Discussion

In our population the HPV infection incidence ranges from 6-50% according to different risk factors (7). Prevalence in pregnant women ranges from 12 to 69% in different reports (8). In a wide series of 1183 patients study of Takakuwa et al. showed that the prevalence in pregnant women were 12.5% and the prevalence was higher in women under age of 25 years compared to those older than 25 years (9). Therefore, age seems to be correlated with HPV positivity not only in non pregnant women but also in pregnant women.

In the clinical study by Watts et al. among 151 women, medical history, clinical manifestations and DNA assay were used for diagnosis and the results revealed that the rate of HPV was 74%. In this study this high prevalence was attributed to many factors like age, history of sexually transmitted disease, social economic status of the patients and drug use (10).

In a study by Koch et al., children aged 0-17 years were screened for HPV from the specimens of anal area and oral mucosa and the positivity was 1.6% and 0.2% respectively. This clinical study showed that HPV infections are rare in childhood and oral cavity may play a reservoir role (11).

In the prospective study of Xavier Castellsague et al. in 2009, Spain, denied the high prevalence of HPV DNA positivity by PCR and they found the rate was 6.5% in certain groups of women. They claimed that this relatively low HPV prevalence in women can be attributed to the low HPV infection rate. However, the prevalence of HPV in pregnant women was three to five times higher compared to the general women population. This situation was explained by the change in the clearance of HPV and HPV positivity due to

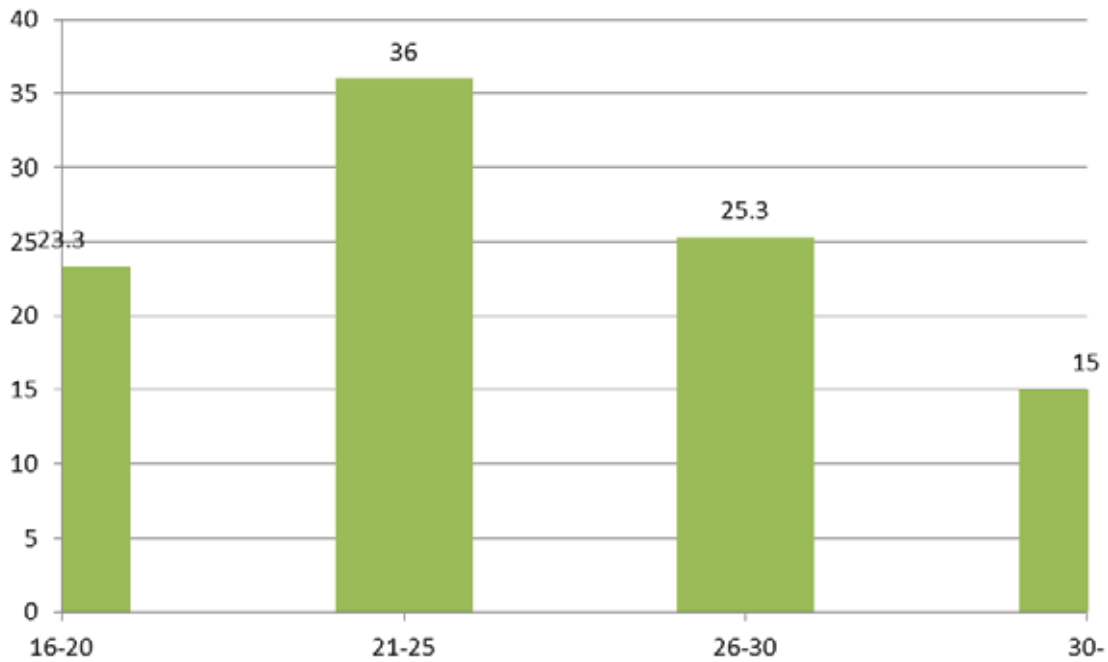


Figure 1. Age distribution of patients

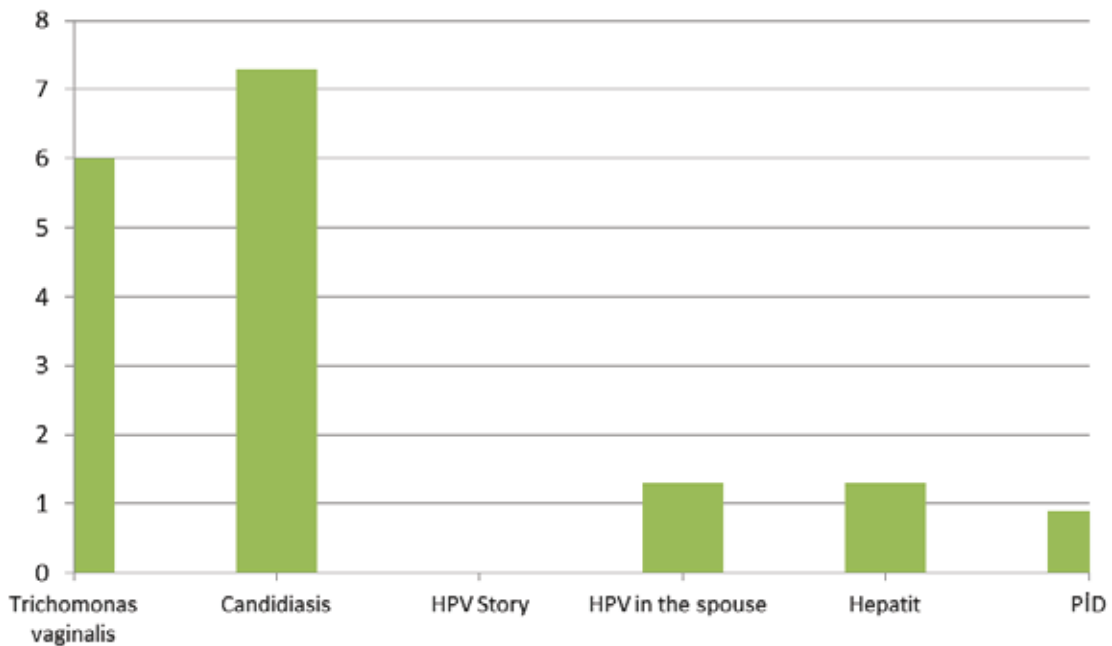


Figure 2. Distribution of patients according to their profile. Clinical characteristics of the study and STD story
 Abbreviation: STD indicates sexually transmitted disease ; TV :*Trichomonas vaginalis*; VC:Vaginal Candidiasis;History of HPV indicates history of previous genital human papillomavirus infection; HPV + Husband: In the male partner, HPV DNA was detected by PCR and the diagnosis was confirmed by hybridization; Hepatit includes Hepatitis B and Hepatitis C;PID: Pelvic Inflammatory Disease:

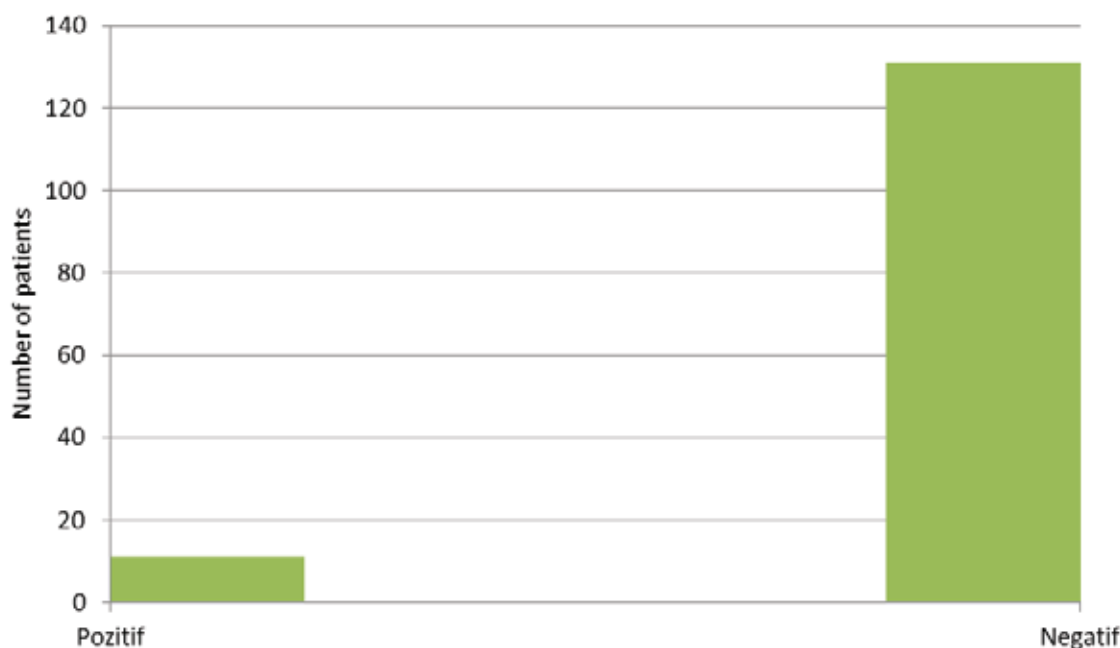


Figure 3. Distribution of HPV positive and negative patients

the hormonal and immunological changes during pregnancy (12,13). In our study, a total of 42 pregnant women were enrolled and in 11 (7.7%) were positive and this prevalence was compatible with the medical literature.

In HPV infections transmission other than sexual transmission especially fetomaternal transmission is important. Because when exposed to HPV in early years of life the risk of anogenital cancers especially cervix, vulva cancers increase. HPV infections can be transmitted vertically from father or mother. The virus can be transmitted from the mother to embryo, fetus or baby during pregnancy or labor. Infection may be transmitted during conception by oocyte or spermatozoon. Up to day virus was isolated in spermatozoa but no study showed the presence of HPV in oocytes yet.

The main maternal transmission of infection to baby is labor. Yet there is no study defining the exact incubation period of the infection and whether the infection transmitted during birth to newborn is life long or not (14). There are studies showing that although the amniotic membrane is intact transmission in cesarian section and amniosynthesis (15).

In the study by Tseng et al. vertical transmission of HPV infection in babies that were born by vaginal way was % 51.4 while this rate was 27% in cesarian babies. In the same study, no significant difference in the buccal and genital virus was found between female and male babies (5).

In the study by Watts et al. no oral and nasopharyngeal HPV positivity was found in the babies that were born by HPV positive mothers from vaginal route. They found positive results in anal and genital area (1.5%) .

In our study, like other studies in literature, no HPV positivity was found in the oral and nasopharyngeal areas (10). Although, the risk of infection is low in cesarian section, there is not enough evidence to advise C/S to all HPV DNA positive mothers. The important point is not the frequency of contamination but the incidence of infection. For that reason, it is necessary to follow for longer periods by testing for HPV (16).

In the study of Tenti et al. among 711 pregnant women the vertical transmission was 11%. In this study, none of the 11 of the babies of HPV positive mothers who had early membrane rupture 2 hours prior to birth had nasopharyngeal aspirates positive

of HPV, however, for the babies this ratios of HPV positivity with early membrane rupture 2-4 hours and more than 4 hours prior to birth was 33.3% and 80% respectively. This implicates the importance of the lag period between the time of membrane rupture and birth (17).

In conclusion, our study showed that among 142 asymptomatic pregnant women, HPV positivity was 7.7%. When the complications of HPV infection are considered, this rate of HPV positivity can create a high medical problem in the near future. The negative results for HPV in babies of HPV positive mother can be attributed to the immediate testing after the birth. For that reason, more studies are needed with longer follow up periods.

Statement

This study received no funding.

Conflict of Interest

There is no conflict of interest in this work

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