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ORIGINAL ARTICLE

Sexual dysfunction in women with human papilloma virus infection in the Turkish population

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ABSTRACT

Human papilloma virus infection (HPV) is the most common sexually transmitted disease. It may increase the risk of several cancers, including those of the cervix, vulva, vagina, head and neck. HPV is usually transmitted during sexual intercourse; there are limited data about sexual dysfunction (SD) after infection with this virus. We aimed to measure the incidence of SD in women with HPV. In this study, we evaluated 67 HPV-infected female patients and 66 healthy controls. The Arizona Sexual Experience Scale (ASEX), Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and Socio Demographic Form were used for evaluation. Gynaecologists and psychiatrists evaluated the participants. Women with HPV were found to have significantly higher Arizona Sexual Experience Scale (ASEX) total scores and ASEX sub scores than the control group in the domains of sexual desire, arousal, genital response, orgasmic experience and their satisfaction from orgasm ($p \leq .05$). The study group shows a statistically significant difference in the Beck Depression Inventory (BDI), but Beck Anxiety Inventory (BAI) scores show no significant differences between the experimental and control groups. Our study shows that HPV positivity in female patients is associated with a significant impairment in sexual function and that this impairment is not related to depression or anxiety.

IMPACT STATEMENT

- **What is already known on this subject?** There are only a few studies concerned with sexual dysfunction in HPV patients. These studies have methodological problems, as they do not rule out the effect of depression on sexual dysfunction. It is very difficult to perform studies on sexual dysfunction and sexually transmitted diseases, because both physicians and patients are reluctant to talk about sexual problems. In the present study, only 6 out of 15 physicians accepted to contribute to the study. Although the physicians gave a questionnaire to more than 400 patients, only 133 of them completed that questionnaire. The most important difficulties in this study was to find enough patients.
- **What do the results of this study add?** Depression and sexual dysfunction are frequently seen in HPV patients. Although depression is one of the most common causes of sexual dysfunction, an HPV infection may lead to sexual dysfunction even in the patients without depression.
- **What are the implications of these findings for clinical practice and/or further research?** HPV infections may be associated with mental health problems and sexual dysfunction. The gynaecologists and other clinicians working with HPV patients should also evaluate patients psychologically and refer patients to psychiatry if required. The psychiatric problems associated with an HPV infection do not only impair sexual functions, but also may lead to difficulties in social life.

KEYWORDS
Sexual dysfunction; human papilloma virus; HPV; cervical cancer

Introduction

Human papilloma virus (HPV) infection is the most common sexually transmitted disease and approximately 80%–90% of women in Western populations are infected with HPV during their lifetime (Bosch et al. 2013). There are limited data regarding the prevalence of an HPV infection in Turkey. Two studies have showed that 17.9% and 23% of Turkish women studied have been positive for HPV (Dursun et al. 2009; Demir et al. 2012).

Although most HPV infections are transient and asymptomatic, they may progress to cervical cancer in a small percentage of women. Certain strains of HPV cause genital warts, whereas high-risk HPV infections are also associated with a considerable number of vulvar, anal, vaginal, and head and neck cancers (Castellsagué et al. 2016). Approximately 120 types of HPV have been described; 40 of them are responsible for genital infection and 14 of them form a high-risk group for cervical cancer. In particular, HPV types 16 and 18 are associated with 70% of cervical cancers and all three vaccines on the market cover these two HPV types. HPV is also associated with 530,000 new cases of cervical cancer

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Table 1. Comparison between the study and control groups with respect to their demographic findings.

	Study group ($n = 67$)	Control group ($n = 66$)	p Value
Age	35.14 (±7.63)	36.42 (±7.16)	.352
Education (University)	47 (73.4%)	45 (69.2%)	.698
Marital Status (Married)	27 (40.9%)	44 (66.7%)	.005
Partner's age	36.51 (±7.76)	38.56 (±7.39)	.104
Partner's education (University)	40 (71.4%)	40 (63.5%)	.435
Smokers	29 (45.3%)	23 (35.4%)	.284
Alcohol/drug dependency	4 (6.6%)	2 (3.1%)	.432
Age of first menstruation	12.94 (±2.20)	13 (±1.34)	.612
Age of first sexual experience	22.33 (±5.82)	23 (±2.85)	.066

and 270,000 cervical cancer deaths worldwide each year (World Health Organisation 2013).

Although gynaecologists describe the pathophysiology of HPV infections and cancer risks to women, they usually neglect patients' psychological problems, including sexual difficulties after diagnosis. People with HPV may display a fear of having cancer, anxiety, depression or sexual dysfunction (Scrivener et al. 2008). Because the domain of sexual problems is difficult to discuss for most patients, unless specialists draw attention to these problems, they are often left untreated. Furthermore, although cancer-related HPV research is abundant, the psychological effects of the disease have drawn much less attention. It has been shown that the psychological effects of HPV-related genital warts have a much greater impact on psychological wellbeing than on physical wellbeing among those infected (Bosch et al. 2013).

The aim of this study was to evaluate the impact of abnormal cervical cytology and/or HPV positivity on sexual health and psychology among Turkish women.

Materials and methods

Study population

Following the local ethics committee approval for this prospective study, patients in the gynaecology outpatient clinic of VKV American Hospital, Istanbul, between August 2014 and June 2017 with an abnormal cytology and/or a positive test for high-risk HPV types were enrolled in the study. A group of gynaecologists and a psychiatrist assessed the participants.

In total, 133 female participants agreed to participate in the study and were enrolled. Of these, 67 had an abnormal cytology and/or were positive for high-risk HPV. The control group consisted of 66 healthy female volunteers of a reproductive age who had no history of HPV positivity. The patients who were diagnosed with HPV-related cervical cytological abnormalities had not received any gynaecological treatment for their diagnosis in the past. The patients were evaluated for 6 weeks after diagnosis.

Women with any known psychiatric disorder or chronic disorder such as neurological, cardiovascular, endocrinological and renal diseases, those with past pelvic or abdominal surgeries (known to cause sexual dysfunction), and those taking medications known to affect sexual function were excluded from the study. The patients who suffered from sexual dysfunction because of their partner, marital problems, or psychiatric or medical illness history that may have negatively affected their sexual function were also excluded. Six patients were excluded due to at least one of these exclusion criteria.

Written informed consent was obtained from the patients and from the control group.

Three validated questionnaires were used to assess the sexual health of the participants: the Arizona Sexual Experience Scale (ASEX), the Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI).

ASEX

The ASEX is a brief scale designed to assess the core elements of sexual functioning: it covers sexual desire, arousal, genital response (lubrication for women), orgasmic experience and orgasmic satisfaction. Possible total scores range from 5 to 30, with the higher scores indicating more sexual dysfunction (SD). The items are rated on a six-point Likert-type scale. The reliability and validity of the Turkish version of the ASEX scale was assessed by Soykan (2004).

BDI

The BDI is a 21-item inventory assessing the symptoms of depression. The total score may range from 0 to 63. Hisli (1988) assessed the reliability and validity of the Turkish version of this test.

BAI

The BAI is a 21-item inventory assessing the symptoms of anxiety. The total score may range from 0 to 63. Ulusoy (1998) assessed the reliability and validity of the Turkish version of the BAI test.

Statistical analysis

We used SPSS 21 software for the statistical analysis. One sample of the Kolmogorov–Smirnov analysis showed that the quantitative data were not normally distributed; thus, non-parametric tests were preferred. Based on the abnormal distribution of the variable, two groups were compared using independent-sample t-tests or the Mann–Whitney U-test or the Chi-square test. The Pearson's correlation coefficient was calculated for assessment of correlations between the ASEX, BDI, and BAI scores. An analysis of covariance (ANCOVA) was used to independently calculate the effects of the gynaecological conditions and HPV infection on sexual function. A two-sided p value less than .05 was accepted as being statistically significant. The Kruskal–Wallis non-parametric test was used to distinguish the effects of depression and anxiety on the ASEX scores.

Results

As shown in Table 1, there was no statistically significant difference between the study group and the control group in

Table 2. Comparison between the study and control groups with respect to their sexual dysfunction, anxiety and depression scores.

	Study group ($n = 67$)	Control group ($n = 66$)	p Value
Desire	3.12 (±1.33)	2.50 (±0.89)	.004
Arousal	3.14 (±1.50)	2.55 (±1.17)	.015
Lubrication	2.94 (±1.22)	2.43 (±0.75)	.010
Orgasm	3.49 (±1.15)	2.86 (±0.83)	.000
Satisfaction	2.58 (±1.17)	2.06 (±0.75)	.005
ASEX total score	14.88 (±5.11)	12.40 (±3.33)	.004
Beck Depression Score	8.08 (±6.76)	5.06 (±5.84)	.002
Beck Anxiety Score	9.11 (±8.22)	6.61 (±7.23)	.052

terms of age, education, profession, age at first intercourse, age of menarche, having a sexual partner at the time of the study, presence of any sexual, physical, or psychological problem in their partner, or smoking status. There was a difference in the marital statuses. There were significantly more married women in the control group (66.7%) than in the HPV-infected study group (40.9%) ($p = .005$). Interestingly, we found an inverse relationship between the age of menarche and the age of first intercourse ($p \leq .05$).

The sexual function scores of the participants are summarised in Table 2. All of the ASEX subset scores including sexual desire, arousal, genital response (lubrication), orgasmic experience and satisfaction were significantly higher in the study group compared to the control group ($p \leq .05$). The average scores for the Beck Depression Inventory were 8 and 5 in the study and control groups, respectively, and the difference is significant ($p = .002$). The difference between the scores of these two groups on the Beck Anxiety Inventory was not significant ($p = .052$). In order to exclude the effects of depression on ASEX scores, we compared all cases for ASEX total scores and ASEX sub scores. The effects of depression were found to be significant on the orgasm and satisfaction sub scores ($p \leq .007$).

To clarify the role of depression in sexual dysfunction, we divided the HPV-positive group into two subgroups depending on their Beck depression scores. Those with scores lower than 13 were designated the no-depression group and those with scores over 14 were designated the depression group. There was no statistically significant difference in the ASEX total or the ASEX sub scores between the depression and no-depression groups ($p > .05$). These results suggest that the sexual dysfunction in the HPV group is not related to their depression.

We also investigated the anxiety and ASEX scores. We divided all 133 cases into three groups according to their Beck anxiety scale scores. Those with scores between 0 and 10 were designated as the normal group, those with scores 11–16 were designated as the mild anxiety group, and those with scores over 17 were designated as the moderate and severe anxiety group. When we compared these three anxiety subgroups, the differences between their ASEX total scores and sub scores of sexual desire, arousal, and orgasm were statistically significant ($p \leq .05$). Then we selected only the 67 HPV patients; there were no differences between the anxiety groups and the ASEX total scores and ASEX sub scores ($p \geq .49$). We can thus say that sexual dysfunction in the HPV group was not related to their anxiety levels, either.

Discussion

HPV is a sexually transmitted disease that may lead to psychosocial distress and physical discomfort (Diaz 2013). There are limited data in the literature regarding the relationship between HPV infections and sexual dysfunction (Hellsten et al. 2008; Inna et al. 2010; Serati et al. 2010; Nagele et al. 2016). To our knowledge, there is no study evaluating the effect of HPV on sexual dysfunction in the female Turkish population.

There are controversial findings regarding sexual dysfunction, depression and anxiety in HPV patients. HPV-positive women may display different reactions during different levels of treatment. These reactions include denial, fear of cancer, anxiety, depression, and grief, among others. The first reaction to an abnormal Papanicolaou result in most women is a fear of cancer. In addition to a fear of cancer, knowing the time when they acquired infection and their future reproductive potential are also very important to patients (Johnson et al. 2011). Precancerous HPV-infected patients who had genital lesions have had sexual dysfunction and anxiety (Nagele et al. 2016). A considerable number of patients continue to feel distress despite normal colposcopy findings and receiving detailed information on their very low risk of cancer and the transient nature of the infection. This suggests that a fear of cancer is not the only factor in psychological impairment and decreased quality of life in HPV-positive women (Maissi et al. 2004; Juraskova et al. 2007; Heinonen et al. 2013; Sharp et al. 2013). HPV positivity is associated with concern about sexual health and may lead to the questioning of a relationship with husband or partner (McCaffery et al. 2004; Nagele et al. 2016).

In the present study, we included HPV-positive women who had not yet received any related treatment. Our data showed that a loss of desire, arousal, and lubrication, as well as a difficulty in reaching orgasm, were significantly higher in the women with HPV compared to the control group, while satisfaction from orgasm was significantly lower. Our results are in agreement with previous studies showing a decrease in at least one parameter of sexual function (McCaffery et al. 2004; Nagele et al. 2016).

Most previous studies evaluate the impact of the treatment rather than the diagnosis on sexual dysfunction, and controversial findings have been reported. In a few studies evaluating the impact of loop electrosurgical excision procedure (LEEP) on sexual dysfunction, at least one parameter of sexual function including spontaneous interest, frequency of intercourse, sexual arousal, lubrication, orgasm and dyspareunia was found to be impaired and remained so up to two years after the procedure (Kilkku et al. 1982; Hellsten et al. 2008; Serati et al. 2010). As conisation is not a primary factor for sexual dysfunction, these results suggest that psychological factors are more important than anatomic factors for sexual dysfunction in HPV-positive women.

Campion et al. evaluated the impact of both diagnosis and treatment of cervical intraepithelial neoplasia (CIN) using a self-designed questionnaire (Campion et al. 1988). Women in their treatment group were treated for CIN with carbon dioxide laser and women in their comparison groups were

undergoing gynaecological care for non-cervical diseases but had partners who had been diagnosed with a sexually transmitted infection, either *condyloma acuminatum* or non-gonococcal urethritis. The authors found that women treated via laser experienced a significantly decreased spontaneous sexual interest and frequency of intercourse, decreased vaginal lubrication and sexual arousal, and decreased frequency of orgasm when compared with their control groups. Women who were treated for CIN also demonstrated a significant increase in negative feelings toward sexual intercourse or toward a regular partner and increased dyspareunia, whereas the women in the comparison group did not. As public awareness has increased, these negative effects may be more pronounced in patients with certain HPV types such as 16 and 18, as most patients now realise that these types are associated with the highest risk for developing cancer.

We think that the different treatment methods applied to HPV patients are interfering with sexual function. The other factors interfering with sexual function include depression and anxiety (Phillips and Slaughter 2000; Mercan et al. 2006). We think that the effects of depression and anxiety were not excluded from earlier research.

Most of the previous studies showed increased depression and anxiety scores in HPV-positive women (Maissi et al. 2004; Kola and Walsh 2009; Heinonen et al. 2013). Depression scores are also higher in the HPV group compared to the control group in our research. Our results are in concordance with the literature. However, we couldn't find a statistically significant difference in anxiety scores between the HPV group and the control group. As we evaluated the patients only six weeks after their diagnosis, anxiety and severe depression may not have yet emerged during this short period. Also, patients undergoing treatment may have experienced more psychological impairment, possibly due to severe cervical cytological abnormalities. We did not evaluate patients after their gynaecological treatment for HPV. We also excluded the effect of depression on sexual function with further analysis. We can say that sexual dysfunction, seen after the diagnosis of HPV infection, cannot be explained by the depression of the patients.

In the present study, we also found that HPV positivity is higher among single women compared to married women. This may be due to the likelihood of single and young women having multiple sexual partners. Catarino et al. (2016) showed that a younger age, a single marital status, and being a housewife are associated with a higher risk of acquiring HPV. Our study also produced a formerly unnoticed result. We established an inverse relationship between the age of menarche and that of first intercourse. Further evaluation may be done with regard to this result among larger groups.

The current study has a few limitations. The number of patients in both the study group and the control group was small due to our difficulty in recruiting participants. Also, due to the short duration of the study, we do not know the long-term effects of HPV positivity on sexual dysfunction and psychological disturbances.

In summary, all of the abovementioned studies reported an increased prevalence of sexual dysfunction in patients treated for HPV-related cervical abnormalities. Although it is difficult to define the role of different factors based on these studies, it is reasonable to propose that fear of cancer is the most important factor in the aetiology of sexual dysfunction in these cases.

Disclosure statement

No potential conflict of interest was reported by the authors.

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