



Lifestyle and Nutritional Risk in Women With Cervical Cancer: A Comparative Study

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Abstract

Objectives: Cervical cancer can be prevented by identifying the lifestyle and diet. The purpose of this research was to compare lifestyle and nutritional risk in Iranian women with cervical cancer and healthy women who referred to hospitals affiliated to Shahid Beheshti University of Medical Sciences, Tehran, Iran during 2015-2016.

Materials and Methods: This descriptive-comparative study was conducted on 120 women referring to hospitals of Shahid Beheshti University of Medical Sciences, Tehran, Iran during 2015-2016. The data collection tool was a questionnaire that covered data on health-promoting lifestyle profile (HPLP), diet, and demographic characteristics. Finally, data were analyzed by SPSS software, using an independent t test, as well as chi-square and Mann-Whitney tests.

Results: Statistical differences were observed between the number of delivery, smoking, and the smoking of the spouse although the difference in HPLP between the 2 groups was insignificant. However, healthy women could better manage their stress and interpersonal relations compared to women who had cervical cancer. As regards diet, fat was statistically different between the two groups ($P < 0.05$).

Conclusions: In general, a change in lifestyle, diet, reduced smoking can decrease the incidence of cervical cancer in women.

Keywords: Cancer cervix, Lifestyle, Nutritional risk

Introduction

Cancer is the third leading cause of death in Iran while this position belongs to cervical cancer in the United States. Based on previous data, 15 million people are diagnosed with cancer, 12 million of whom will die by 2020 (1). As mentioned, cancer is the third main cause of death in Iran with 300 000 people killed annually (2). About 84% of cancers are reported in less developed regions (3). In 2012, cervical cancer was the 11th cause of cancers in women (9.9 per 100 000) and the 9th cause of cancer deaths (8.3 per 100 000) in developed countries (4). In Iran, the prevalence of cervical cancer was 2.17 per 100 000 cases in 2009, ranking 11th among Iranian women's cancers (2). Cervical cancer treatment has significant side effects on the physical, sexual, and reproductive aspects of women. Most gynecologic cancers occur in women of older ages while cervical cancer engages young women (5). Only 5%-10% of cancers have a genetic origin (6) whereas 90%-95% of them are due to environmental and lifestyle factors (7). According to the estimations of the World Health Organization (WHO), 70%-80% of the mortality rate in developed countries is due to lifestyle changes and it anticipates that lifestyle changes cause 7 out of 10 deaths in

developing countries by 2020 (8). In addition, more than 70% of the illnesses are caused by non-communicable diseases by 2026 in Iran and lifestyle is believed to have a special role in this regard (9). Although the pathogenicity of human papillomavirus (HPV) is proven in cervical cancer, especially HPV 16 and 18, it is insufficient and the lifestyle of women exposed to HPV can facilitate or control the effects of the virus. Sexual transmission is the most common way of virus transmission (10). It is noteworthy that the virus can be early detected and diagnosed through screening programs (11) and changing the lifestyle increases life expectancy in cancer survivors. (12). A limited number of studies have evaluated the lifestyle of gynecologic cancer survivors. (13-15). Increased cigarette smoking is observed in young women with cervical cancer (16). On the other hand, lifestyle is a way to provide, maintain, and improve health (8) thus cancer can be largely prevented by lifestyle modification (17). Today, by moving from a treatment approach to disease prevention, the WHO emphasizes the importance of promoting health and one of its components, namely, changing to a healthy lifestyle (18). A healthy lifestyle controls health costs, increases the quality of life, and reduces the burden

Received 29 April 2018, Accepted 26 October 2018, Available online 10 November 2018

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of diseases (19). Nutrition is considered as one of the important environmental factors which is associated with cancer (20). Previous studies have shown that nutrition alone is responsible for 3% to 40% of all cancers (21,22). Approximately 30% and 20% of cancers in developed and developing countries are caused by nutritional factors, respectively (23), and the role of nutrition in cancer prevention is evident. (24). Therefore, maintaining and improving nutrition style is essential for maintaining and improving health (25). Thus, it is essential to be familiar with lifestyle and nutrition habits for planning health and education programs in the field of cancer since cancer risk factors vary due to differences in lifestyle, climate, and the type of food which is available in different societies. In this study, the researchers sought to answer whether lifestyle and diet have any relationship with cervical cancer. To this end, this study aimed to compare the lifestyle and nutritional risk in women with cervical cancer and healthy women who attended the hospitals affiliated to Shahid Beheshti University of Medical Sciences in Tehran, Iran during 2016.

Materials and Methods

This descriptive-comparative study was conducted in hospitals affiliated to Shahid Beheshti University of Medical Sciences in Tehran, Iran between October 2015 and March 2016. The hospitals with oncology sections (i.e., Taleghani, Imam-Hosseini, and Shohadaye-Tajrish Hospitals) were designated and the women who referred to these hospitals for cervical cancer treatment comprised the patient group. Further, healthy women (control group), referring to other clinics and meeting the inclusion criteria, were selected through the convenient sampling method. Eligible women presented to the above hospitals were selected for participation in the study, therefore, 120 women were divided into 2 equal groups of 60 each (the type I error α of 0.05, the power value of 90%, and the effect size of 60%). After explaining the goals and obtaining written consent from the women, they were enrolled upon their willingness. The participating women were assured of the confidentiality of their data and were provided with further information, if necessary. Furthermore, women were free to participate and could leave the study at any time. The inclusion criteria were having Iranian nationality and having CIN1, CIN2, or approved cervical cancer by a gynecologist in the patient group. Women were excluded from the study if they were unwilling to participate or fill out an incomplete questionnaire. Based on the aim of the study a questionnaire was used to collect the required data. Moreover, the cervical cancer stage was extracted from the gynecological records of the patients. Initially, an instrument was applied to gather socio-demographic information from the woman and her spouse (44 questions). The second part, health promoting lifestyle profile (HPLP), developed by Walker and Hill-Polerecky (26), contained 52 items and each item

was rated on a four-point response (never to always). This part covered health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations, and stress management. The points of the statements in each domain were summed up to obtain the score of each domain and then the scores of all questions were added up to obtain the total score of the questionnaire. The Persian version of HPLP II was used in this study, the reliability and validity of which was confirmed by Mohammadi Zeidi et al (27). In addition, the validity and reliability of this form were assessed using the content validity and test-retest methods. The Cronbach alpha coefficient was ($\alpha=0.80$) and the reliability was measured by test-retest with a one-week interval ($r=0.81$). Further, the third part was the diet questionnaire with 93 questions, which was approved by the Research Institute for Endocrine Science, Shahid Beheshti University of Medical Sciences. This form contained all nutritional factors such as fruits, vegetables, fat, nut, meat, and the like which were scored on a 4-point scale from "per day, week, month, year, and not at all ranging from 4 to 0". Using concurrent validity and test-retest methods, the reliability was determined as $r=0.78$ and the Cronbach's Alpha coefficient was estimated at $\alpha=0.79$. The 2 groups were matched by age and the sampling place. Eventually, the obtained data were analyzed by the SPSS software (version 16) utilizing descriptive statistics, *t* test, as well as Mann-Whitney and chi-square tests. The values of $P<0.05$ were considered statistically significant.

Results

The current study was conducted on 120 women, and their demographic data are presented in Table 1. The mean age of women was 39.01 ± 1.02 and 38.73 ± 1.31 years in patient and healthy groups, respectively. Further, the mean age of the first intercourse in women was 18.10 ± 7.80 and 19.58 ± 7.11 years in patient and healthy groups, respectively. In patient group, the level of education was high school diploma (63.3%) and 50% of them were housewives and 53.3% of them had a normal vaginal delivery while in healthy group, women had university education (43.3%), 41.7% of them were housewives, and 46.7% of these women had a normal vaginal delivery. Furthermore, the mean age of patients' spouses was 42.50 ± 1.56 , 46.7% of them were employees, and 40% of these men had a high school education. Moreover, the mean age of healthy women's spouses was 40.93 ± 1.50 , 56.7% of them were employees, and 50% of these men had a university education. As shown in Table 1, the number of delivery and smoking women and their spouses were significant in the two groups ($P<0.05$). As regards the HPLP questionnaire, the mean score of HPLP was higher in healthy women as compared to patient women but it was not significantly different. Contrarily, a significant difference was found between the groups in terms of interpersonal relations and stress management ($P<0.05$), the details of which

Table 1. Distribution of Patient and Healthy Women and Her Spouse by Their Characteristics

Variable	Patient Women	Healthy Women	Test	P
BMI	25.90 ± 3.63 ^a	24.09 ± 3.13 ^a	t test	0.100
Age of marriage (y)	20.70 ± 4.60 ^a	20.98 ± 4.95 ^a	t test	0.732
Number of delivery	16.3 ± 2.90	2.11 ± 1.60 ^a	t test	0.014*
History of OCP				
Yes	34 (56.7)	33(55) ^b	χ ²	0.201
No	26 (43.3)	27 (45)		
History of IUD				
Yes	12(20)	11(18.3) ^b	χ ²	0.110
No	48(80)	49(81.7)		
Smoking				
Yes	9 (15)	12(20) ^b	χ ²	0.000*
No	51 (85)	48 (80)		
Smoking spouse				
Yes	39 (65)	34 (56.7) ^b	χ ²	0.000*
No	21(35)	26(43.3)		

BMI, Body mass index; OCP, oral contraceptive pill; IUD: Intrauterine device.

^a Mean±SD; ^b No. (%); *P<0.05.

are provided in Table 2. Regarding the diet section, fat consumption was significantly different ($P<0.05$) between the 2 groups (Table 3).

Discussion

In this study, the number of delivery in patients was higher than that of healthy women. Similarly, Misra et

al indicated that high childbirth plays a significant role in the distortion and transformation of cervical cells (28). Sreedevi et al showed that multiple pregnancies are considered as an epidemiological risk factor (29). It seems that extremely high levels of estrogen and progesterone in the blood, which are at their highest levels during pregnancy, change the bond between the squamous and

Table 2. Comparison of HPLP in 2 Groups of 60 Women

Dimension of HPLP	Healthy Women (Mean Rank)	Patient Women (Mean Rank)	P value
Nutrition	64.54	56.46	0.201 ^a
Physical activity	66.52	54.48	0.057 ^a
Health responsibility	61.62	59.38	0.722 ^a
Stress management	68.16	52.84	0.015a*
Interpersonal relations	68.29	52.71	0.013a*
Spiritual growth	59.45	61.55	0.740 ^a
Total	6.98 ± 195.39	6.32 ± 182.77	0.057 ^b

HPLC, Health-promoting lifestyle profile.

^a Mann-Whitney test; ^b t test.

Table 3. Comparison of Diet in 2 Groups

Nutritional Components	Healthy Women (Mean±SD)	Patient Women (Mean±SD)	P Value
Cereals	48.8 ± 11.56	47.31 ± 12.12	0.296 ^a
Meat	58.85 ± 10.05	63.21 ± 9.41	0.057 ^a
Meat (fish and chicken)	54.03 ± 15.22	56.11 ± 14.38	0.485 ^a
Honey	80.42 ± 21.13	80.41 ± 19.03	0.824 ^a
Tea	92.08 ± 20.83	91.66 ± 19.88	0.950 ^a
Spices	86.66 ± 20.82	85.83 ± 18.62	0.576 ^a
Pickles	71.14 ± 13.32	66.77 ± 10.94	0.133 ^a
Oil	52.58 ± 13.40	59.83 ± 11.94	0.047 ^{a*}
Vegetables	67.29 ± 7.70	65.69 ± 9.47	0.546 ^a
Cooked vegetables	60.83 ± 10.18	58.85 ± 10.15	0.349 ^a

SD, Standard deviation.

^a Mann-Whitney test.

columnar epithelium cells (30). Additionally, Muñoz et al argued that epithelium eversion and the metaplasia of squamous epithelium are common during pregnancy and cervical ectropion causes the HPV to become more exposed and makes the person susceptible to cancer as well (31). In contrast, Anorlu found, men could have a role in the development of cervical cancer since the incidence of cervical cancer increases by an increase in the number of wives a man has based on several marriages (32). Our results demonstrated a relationship between smoking women and their spouses with cervical cancer. Likewise, Appleby et al concluded that the incidence of cervical cancer was higher in smoking patients (33). In addition, Gandini et al reported that smoking can both cause cancer and facilitate the development of cancer. However, scientists have not yet been able to explain this relationship (34). Cigarettes might be a cofactor of women's cancers, which works through thickening the cervical mucus (35). Smoking further decreases the immune response in cervical cells and may affect the metabolism of female hormones. One should also consider that genetic damage is directly related to tobacco carcinogenesis (36). The comparison of the dimension of lifestyle and stress management indicated a significant relationship between the two groups. The mean score of stress management in patients was lower compared to healthy women, which is in agreement with the result of the study by Reiter et al (35). Similarly, Oran et al discovered changes in HPLP is possible by increasing the awareness about the periodic screening of cancer, but this is not applicable to all women in the community. It is believed that stress changes the regularity of hormones which are secreted by the pituitary and hypothalamus (37). It causes emotional disorders such as anxiety and depression as well (38). Cancer diagnosis and treatment are associated with various stress and anxiety which worsen the disease severity in patients with cancer. High stress occasionally inhibits treatment or preventative behaviors (39). One of the most important factors affecting the mental status of cancer patients is how they cope with cancer-induced stresses. For instance, Pillay et al reported avoidance, disappointment, and frustration are likely to increase the recurrence of cancer (40). Moreover, Clemmens et al showed that the expression of excitement is associated with an increased likelihood of recovery in cancer patients (41). Likewise, You et al. reported that optimistic patients with cancer feel less pain and have a better performance in other areas of life (42). Sisoletsky et al also argued that the rate of recovery is lower in disappointed patients (43). Kapogiannis et al in their study found that the use of relaxation techniques reduces stress and anxiety in cancer patients (44). Additionally, relaxation is believed to reduce muscle tension and eliminate stress-induced undesirable physiological effects. In addition, relaxation techniques with a coping effect against stress decrease the activity of the sympathetic nervous system, as well as the secretion

of the catecholamines (45). In the present study, there was a significant difference in interpersonal relations between the two groups, which is in line with the findings of Semple et al (46). Patients with cancer have some degrees of psychiatric and emotional disorders such as depression, anxiety, incompatibility with the disease, reduced self-confidence, along with a fear of the recurrence of the disease and death (47). These patients exhibit a lower level of resilience and are prone to mental illness as well (48). The number of close friends and participation in social activities lead to an increase in hopeful thoughts and thus reduce mortality (49). Furthermore, hair loss and other changes caused by the disease and its treatment are among the causes of a change in patients' mood, which leads to their reduced communication. Cancer also alters patients' mental image. In other words, changes in the appearance alter the mental needs of many patients and lead to their little desire for communication. They may not make eye contact, do not carry out therapeutic and self-care recommendations, and show anger and aggression responses. In addition, the weakening of morale due to the knowledge of cancer diagnosis and its unpredictability is considered as a deterrent factor for communication (50). In diseases such as cancer that are associated with rapid progress and sudden changes, treatment might disrupt the psychosocial mechanisms of the patients and make them feel sad. In the acute phase of the disease, patients are dreaming of returning to their former lives, and they become anxious and depressed when they realize they are no longer able to achieve it (51). Therefore, this situation poses a significant impact on their communication interactions. Emotional support from the family, especially the spouse and friends, in cancer patients is associated with increased self-esteem and decreased distress and the feeling of vulnerability, which is achievable with effective communications (52). Regarding the diet dimension in this study, the researchers observed that the prevalence of the lipid diet of patients was higher than that of healthy women, which is in conformity with the results of Ulmer et al and Cust et al (53,54). It is found that estrogens stimulate hepatic triglyceride secretion (55) and high serum triglyceride concentrations may also reflect plasma glucose levels. Further, hyperglycemia and Inflammation are the other potential mechanisms of hypertriglyceridemia (58,59). Similarly, sexually transmitted globulin concentrations may be linked to colorectal cancer risk by bile acid excretion, circulation hormones, or energy supply to neoplastic cells (53). Lipid metabolism is involved in cancer cell biology as well. Furthermore, the synthesis of DNA and proteins along with the production of lipids is necessary for cell growth and proliferation. However, lipids are also active players in signaling processes that are involved in cell transformation and tumor development. Lipids cause cellular hypoxia, and cell proliferation triggers hypoxia-inducible factor activity (60). Ghosh

et al recommended that a Mediterranean diet may be important in reducing the risk of cervical cancer (61). In contrast, other researchers argued that folate, vitamin B12, and vitamin B6 may play a role in HPV integration (62).

Limitation of the Study

The limitation of our study included the lack of information on the high-risk behaviors of the spouse since some people would not discuss any instances of drug abuse by women or their spouses.

Conclusions

Many of the current problems in this society, particularly in women are due to the transition of society from a traditional to a modern model. The incidence of cancer is rising in the world and young women are still the victims of cancer. In addition, the consumption of processed and high-fat foods can make the women of our society more vulnerable to cancer. On the other hand, stress relief and increased interpersonal relationships can reduce the incidence of the disease in cervical cancer patients. Although the role of HPV in cervical cancer is evident, the lifestyle of women with the disease is also effective.

Conflict of Interests

Authors declare that they have no conflict of interests.

Ethical Issues

All stages of this study, including the approval and implementation were approved by the Ethics Committee of the Research Deputy of Shahid Beheshti University of Medical Sciences, Tehran, Iran (No. SBMU2.REC134.53).

Financial Support

The research was funded by Shahid Beheshti University of Medical Sciences Tehran, Iran.

Acknowledgments

The authors would like to appreciate the cooperation of the Research Deputy of Shahid Beheshti University of Medical Sciences, Tehran, Iran and all women who participated in this research.

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