ORIGINAL ARTICLE

Awareness and knowledge about cervical cancer prevention methods among Tunisian women

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Keywords

Cervical cancer prevention• Anti-HPV vaccine • Women • Tunisia

Summary

Introduction. *Epidemiological and biological arguments put papillomavirus infection (HPV) as a determining factor in the etiology of cervical cancer. The main objective of this study is to assess the knowledge, attitudes and practices related to HPV prevention and cervical cancer screening among women living in the city of Sousse, Tunisia.*
Methods. *Five hundred Tunisian women were interviewed face to face between May and June 2016. The questionnaire consisted in 14 questions relating participants' socio-demographic information, their awareness level, attitudes and practices regarding HPV and cervical cancer, including their understanding of the underlying cervical cancer etiology and preventive actions such as the Pap Smear test, and finally their acceptability and willingness to receive the anti-HPV vaccine under certain circumstances. Multivariate analyses were conducted to identify predictive factors of good acceptability of cervical cancer prevention methods.*
Results. *Four hundred fifty-two questionnaires were completed and included in the analysis. The awareness of a sexually transmitted infection as an etiological agent for cervical cancer was expressed by 175 (38.7%) participants, the correct finality of the Pap Smear test by 308 (68%) and its recommended frequency by 176 (38.9%) respondents. Among all participants, 125 (27.7%) had undertaken the Pap Smear test at least once in their lifetime, 363 (80.3%) were interested in receiving the anti-HPV vaccine for themselves, 387 (86%) for their daughters and 405 (90%) approved the introduction of the anti-HPV vaccine in the Tunisian national program of vaccination.*
Conclusions. *The knowledge and awareness of HPV infection and cervical cancer among Tunisian women was found to be moderate (around 40%) and the acceptability of the anti-HPV vaccine was found to be high (over 80%). These results are concordant with the results of other studies conducted in other MENA countries.*

Introduction

Given the conservative cultural context of the Middle East - North Africa (MENA), the prevalence of sexually transmitted infections (including human papillomavirus [HPV]) has previously been reported to be low in this specific region compared to the rest of the world [1]. Knowing this context, and given the rapid changes in the lifestyle induced by globalization, sexual behavior, especially among younger generations, is changing towards more liberal practices compared to the previous decades. These changes may induce an increase of the prevalence of sexually transmitted diseases among youth population of the MENA region [2].
Knowing the scientifically proved etiologic link between HPV infection and cervical cancer, similar findings were reported regarding the cervical cancer incidence in this area [3, 4].
However, despite the current relatively low incidence rates, cervical cancer is considered a public health issue in the MENA region [5]. This fact may be explained by the lack of governmental willing to establish a national cervical cancer prevention program in the MENA region and to include the anti-HPV vaccine within national vaccination programs [5]. This position has often been justified by cultural and religious sensitivities that may limit the success of sexually behavior related vaccination such as the anti-HPV vaccine [6].
That said, several studies investigated the acceptability of the anti-HPV vaccine in various MENA countries (Lebanon, Iran, Morocco, Saudi Arabia, Turkey, etc). These studies showed that despite the low level of HPV and cervical cancer knowledge among women in this area [7-10], all findings revealed moderate to high acceptability of the anti-HPV vaccine [11-14]. Since no study has been yet focusing on the specific case of Tunisia, we conducted the current study to assess whether trends reported for the rest of the region were also valid in the Tunisian context. These results would be useful for the design of an efficient and effective Tunisian national anti-HPV vaccination program.

Methods

This cross-sectional study involved the administration of 500 questionnaires to randomly selected women from different age groups in the general population of the city of Sousse, Tunisia. The questionnaires were administered through direct interview of patients visiting outpatient clinics in "Farhat Hached Hospital" or visiting the waiting area of the National Health Insurance Fund - CNAM

(la Caisse Nationale de l'Assurance Maladie) between May and June 2016. Participants answered a questionnaire that assessed their knowledge, attitudes and practices regarding HPV and cervical cancer screening.
The designed questionnaire is semi-structured and composed of 14 questions. The first 4 questions gather sociodemographic information of the participants (age, professional activity, marital status, health sector). The next 6 questions assess participants' knowledge, attitudes and practices regarding HPV and cervical cancer, including their understanding of the underlying cervical cancer etiology and preventive actions such as the Pap smear test. Finally, the last 4 questions assess the acceptability and willingness of participants to receive the anti-HPV vaccine under certain circumstances.
All respondents were informed of the voluntary and anonymous nature of the study. A research assistant assisted each of the participants when filling the questionnaire to make sure that all the questions were well-understood. Fully completed questionnaires were obtained from 452 respondents, representing a final participating rate of 90.4% of our conventional sample.

Statistical analysis

Data was entered to the computer software Statistical Package for Social Sciences (SPSS Inc., Chicago, IL., USA) version 20 for the purpose of analysis.
Descriptive statistics were reported using mean ± standard deviation (SD) for participants' age, frequency and percentage for all the rest categorical variables.
In addition to the descriptive analysis, multivariate analyzes were conducted to assess the association between participants' demographics (age, work status, marital status, and health sector) and the Pap Smear test history, then second the acceptability of the anti-HPV vaccine. The acceptability of the vaccine was assessed through several proxies such as the willingness to receive the vaccine, the willingness to get daughter vaccinated and being favourable to the inclusion of the anti-HPV vaccine in the Tunisian national vaccination program. Multivariate logistic regression analyses were performed for the following associations:

- the association between main participants' demographics [age (continuous), marital status (categorical: single/married/divorced or widow), professional status (categorical: none/employee/student) and health sector (categorical: private/public/private and public)] as independent variables and the Pap Smear test history as the dependent variable (categorical: yes/no);
- the associations between Pap Smear test history (categorical: yes/no) and main participants' demographics [age (continuous), marital status (categorical: single/married/divorced or widow), professional status (categorical: none/employee/student) and health sector (categorical: private/public/private and public)] as independent variables and a) the awareness of the existence of an anti-HPV vaccine, b) the interest in receiving the vaccine, c) the interest in giving the anti-HPV vaccine to daughters and d) the acceptability of including the anti-HPV vaccine within the national vaccination program as dependent variables (categorical: yes / no);
- logistic analyses results are presented in Table I and all association with statistical p-values of less than 0.05 were considered as significant.

Results

The results are grouped under first socio-demographic data, second the participants' knowledge and awareness level, third the acceptability of cervical cancer prevention methods and finally the associations between participants sociodemographic determinants and proxies of the acceptability of cervical cancer prevention methods.

Participants' socio-demographic profile

452 completed questionnaires were suitable for analysis. The respondents consisted in Tunisian women with an overall mean age of 30.8 years old (± SD 6.9 years), ranging between 18 and 62 years old.
Among the 452 participants, 193 (43%) were single, 242 (53%) married and 17 (4%) divorced or widow. Two hundred and sixty-three (58%) respondents were professionally active, 115 (25%) students and 74 (16%) housewives. Three hundred and thirty-one (73 %) participants usually consulted in the private sector, 99 (22%) in the public sector and the remaining 22 (5%) participants declared consulting in both sectors. The demographic information is shown in Table II.

Participants' knowledge and awareness regarding cervical cancer prevention methods

The awareness of the Pap Smear test recommended frequency, cervical cancer risk factors, HPV infection spread ways and the awareness of the existence of an anti-HPV vaccine are shown in Table III.
Only 125 (28%) respondents had already received the Pap Smear test at least once in their lifetime and 188 (42%) were aware of existence of the anti-HPV vaccine. Regarding the recommended frequency of Pap smear test, 176 (39%) women were aware that the correct frequency is 3 to 5 years.
With regards to the Pap smear test finality, 109 (24%) participants declared knowing or assuming that it is for sexually transmitted infections screening, 308 (68%) for cervical cancer screening, 7 (2%) for cervical cancer treatment and 93 (21%) women declared having no idea.
Concerning the cervical cancer risk factors, the "genetic dimension" was selected by 227 (50%), "sexually transmitted infection" by 175 (39%), "multiple partners" by 146 (35%), "partner having multiples partners" by 107 (24%), "immunity issues" by 153 (34%), "smoking" by 125 (28%), "no idea" by 69 (15%) women among all the participants.
Regarding the HPV spread ways, the correct options are: "unprotected sex" selected by 242 (54%), "protected sex" selected by 5 (1%) participants. Regarding incor-

Tab. I. Analysis of association between demographics and acceptability of Pap Smear test and anti-HPV vaccine.

	Age		Work status		Health sector		Marital status		Pap Smear test history	
	OR-IC (95%)	P-value	OR-IC (95%)	P-value	OR-IC (95%)	P-value	OR-IC (95%)	P-value	OR-IC (95%)	P-value
Pap Smear test history	1.10 (1.06-1.15)	0.00	0.63 (0.40-0.98)	0.04	1.93 (1.10-3.40)	0.22	4.37 (2.43-7.86)	0.00	-	-
Aware of the existence of the anti-HPV vaccine	0.96 (0.89-1.03)	0.25	0.69 (0.35-1.34)	0.27	2.30 (1.02-5.20)	0.04	0.94 (0.40-2.20)	0.89	0.58 (0.24-1.42)	0.24
Interested in receiving the anti-HPV vaccine	0.99 (0.95- 1.03)	0.54	1.03 (0.68-1.57)	0.89	0.97 (0.60-1.56)	0.89	0.94 (0.56-1.60)	0.83	0.67 (0.36-1.25)	0.21
Interested in giving the anti-HPV vaccine to their daughters	0.99 (0.94-1.03)	0.62	0.83 (0.51-1.34)	0.44	1.40 (0.81-2.41)	0.23	0.85 (0.46-1.56)	0.60	1.04 (0.53-2.04)	0.91
Interested in including the anti-HPV vaccine within the vaccination national program	0.98 (0.93-1.04)	0.51	1.01 (0.59-1.75)	0.96	0.94 (0.51-1.73)	0.84	1.22 (0.61-2.46)	0.57	0.49 (0.20-1.19)	0.12

rect options, "blood" was selected by 71 (16%), "public toilets" by 69 (15%) women and 157 (35%) participants reporting having no idea.

Participants' acceptability of cervical cancer prevention methods

Concerning the willingness to receive the anti-HPV vaccine, the results are presented in Table III: 363 (80%) participants were or would be interested in receiving the anti-HPV vaccine if recommended by their doctors, 387 (86%) were or would be interested in giving their (future) girl the anti-HPV vaccine if recommended by their doctors, and finally 405 (90%) were favourable to the inclusion of the anti-HPV vaccine in the national vaccine program as it would be free and systematic for all Tunisian girls.

Tab. II. Socio-demographic information.

	Total sample (452)	%
Profession		
None	74	16,4%
Employee	263	58,2%
Student	115	25,4%
Health sector		
Private	331	73,2%
Public	99	21,9%
Private and public	22	4,9%
Marital status		
Single	193	42,7%
Married	242	53,5%
Divorced/Widow	17	3,8%

Associations between participants socio-demographic determinants and proxies of the acceptability of cervical cancer prevention methods

Multivariate logistic regression analyses results presented in Table I are showing statistically significant associations between Pap Smear test history and the four considered demographics: age 1.10 CI (1.06-1.15), working status 0.63 CI (0.40-0.98), marital status 4.37 CI (2.43-7.86) and the health sector 1.93 CI (1.10-3.41). However, a unique statistically significant association was found between the awareness of the existence of an anti-HPV vaccine and the health sector 2.30 CI (1.02-5.20). No further statistically significant associations were found between participants' demographics and the interest in receiving the vaccine, giving it to daughters or including the anti-HPV vaccine within the national vaccination program.

Discussion

Cervical cancer is a preventable disease and one of the key aspects of its prevention is the early detection of the premalignant lesion through the cervical screening or by the anti-HPV vaccine prior to any sexual relationships.

Major findings of the present study showed that 28% of the respondents had already received the Pap smear test at least once during their lifetime. This result is concordant with Hammas-Hlaili study that revealed that 22.6% (17.6-27.6) of the women from east-center of Tunisia had already received the Pap smear test at least once in a lifetime [15]. However, these results are not valid for es-

Tab. III. Level of Cervical Cancer and HPV knowledge and anti-HPV vaccine acceptability among respondents.

	Total sample (452)	%
Pap Smear test history	**125**	**27.7**
Cervical cancer risk factors		
Genetics	227	50.2
Viral infection	175	38.7
Multiple sexual partners	156	34.5
Partner had multiples sexual partners	107	23.7
Immune system issues	153	33.8
Smoking	125	27.7
No idea	69	15.3
Pap Smear test finality		
Sexually transmitted infection screening (false)	109	24.1
Cervical cancer screening	308	68.1
Cervical cancer treatment (false)	7	1.5
No idea	93	20.6
Recommended Pap Smear test frequency		
Annual (false)	185	40.9
Every 3 to 5 yeas	176	38.9
Every 10 years (false)	1	0.2
No idea	90	19.9
Routes of HPV spread		
Unprotected sex	242	53.5
Protected sex	5	1.1
Blood (false)	71	15.7
Public toilets (false)	69	15.3
No idea	157	34.7
Already heard about anti-HPV vaccine	188	41.6
(Would be) interested in receiving anti-HPV vaccine if suggested by their doctor	363	80.3
Favourable to the administration of the anti-HPV vaccine to their (future) daughters if suggested by the doctor	387	85.6
Supports the introduction of anti-HPV vaccine in the national immunization program (systematic and free)	405	89.6

pecially the rural region of Tunisia where only between 11% and 13% had received the Pap smear test [15].

This study also revealed some concerning findings: first, regarding cervical cancer risk factors, less than the half of all participants identified sexually transmitted infections as a risk factor for cervical cancer. Second, regarding HPV spread ways, participants were not properly aware especially of the possibility of HPV spread through unprotected as much as through protected sex. Third, regarding the recommended frequency of the screening, we notice that 20% of participants reported having no idea about the recommended periodicity. All these results represent real opportunities for improving HPV and cervical cancer awareness among Tunisian women and confirm findings reported in other studies regarding the low to moderate knowledge level about HPV infection and prevention from the cervical cancer.

Regarding the acceptability of the anti-HPV vaccine, participants were highly willing to receive the anti-HPV vaccine if it was relevant for them and to agree that their daughters or future daughters receive it. They were also extremely favourable (> 90%) to the inclusion of the anti-HPV vaccine in the national vaccination program in order to make it systematic and free for all Tunisian girls. This finding also confirms the trend reported throughout the region of moderate to high acceptability of the HPV vaccine among women in the region despite the low level of knowledge about HPV and cervical cancer [16].

Regarding the assessment of the association between participants demographics and the acceptability of cervical cancer prevention methods, results showed that history of Pap Smear test is statistically associated to participants' working status, health sector in which participants are used to consult and their marital status.

However, these associations were not valid for the acceptability of anti-HPV vaccine. These results can be explained by the fact the anti-HPV vaccine is relatively new in comparison to the Pap Smear; therefore, women from all ranges of demographics are still much less informed and sensitive to this primary prevention method. This situation may explain the absence of trends or statistically associations between participants demographics and the proxy variables of the acceptability of the anti-HPV vaccination.

Limitations

This study is the first in Tunisia to analyze the awareness and acceptability of Tunisian women of two prevention methods of cervical cancer. Among the main limitations of this study, we first mention the potential recall bias: women may not accurately recall if yes or no they undertook a Pap Smear test. The second limitation of the study is the potential selection bias associated to the participants' selection that included women only from care centers or healthcare administrative services; this selection of a non-representative conventional sample may limit the external validity of the study and the generalizability of our findings to the rest of Tunisian women. Finally, a final limitation of this study is the potential bias of social desirability since women responses may not reflect the reality of their opinions and may be formulated in a way to not be judged by the interviewer.

Conclusions

In conclusion, the knowledge and awareness levels of cervical cancer prevention methods through screening and anti-HPV vaccination among Tunisian women are similar to the trend found in other MENA countries. However, these levels are considered low compared to developed countries. Therefore, a national cervical cancer prevention program is still needed to be implemented in Tunisia. In this sense, regional cervical screening and inclusion of the anti-HPV vaccine in the national vaccination program should be encouraged. All involved health care professionals (gynaecologists, nurses, midwives etc.) should benefit from educational initiatives in order to contribute to the enhancement of the usage of cervical cancer prevention methods available for Tunisian women.

In addition to that, it is important to promote awareness among women with risk factors of cervical cancer, to emphasize the importance of Pap smear test on a regular basis and to guarantee them adequate follow-up and emotional support when needed. It is also important to sensitize parents about the advantages the anti-HPV vaccine would give to their daughters and to reassure them about the vaccination safety. These are all urgent measures essential to undertake in order to reduce morbidity and mortality associated to cervical cancer in Tunisia.

Acknowledgments

This paper is dedicated to the memory of my supervisor for whom I will always be thankful, Pr. Soltani, who recently passed away and who inspired and supervised this project. Without his contribution, support and guidance this would never had been possible.

The author declares that there is no conflict of interest.

Author's contributions

RG was responsible of all the phases of this study: study design, data collection, descriptive analysis and manuscript writing. She was supervised by Pr Soltani who unfortunately passed away in 2016 and was not able to give his explicit approval on the final draft of this study.

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■ Received on October 3, 2017. Accepted on November 28, 2017.

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