

Female Secondary School Students Sexual Exposure, Anti HPV Vaccine Awareness and Practice in High Cervical Cancer Prevalence Environment

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ABSTRACT

Background: Introduction: Eighty-five per cent of new cervical cancer cases in the world were recorded in developing countries in 2018. Implementation anti-HPV vaccine can prevent HPV infection by more than 90%. In Cameroon, the incidence of CC is 100 cases/100000 women and 27% of female adolescent have risky sexual behavior. The aim was to assess sexual behavior and the rate of vaccination against HPV in urban and rural secondary school girls in a country a high incidence and mortality due to CC.

Method: It was a Knowledges Attitude and Practice study conducted in 10 secondary schools in the capital city of Yaoundé, and the rural town of Ndikinmeki including female students only.

Results: Among the 1313 respondents, (30.4%) students were sexually active, the youngest age of first sexual intercourse was 12 and 14 years in urban and rural secondary school respectively. Oral or anal intercourse were occasional in urban area schools. The knowledge on HPV vaccine were bad but the acceptability was good although only 0.8% received occasional HPV vaccine.

Conclusion: Large scale sensitization and affordability of HPV-vaccine should be implemented in order to reduce the coming incidence of CC.

Keywords

Sexual behavior, Secondary school female, HPV vaccine, Ndikinmeki.

Introduction

Cancer of the cervix (CC) is the second most frequent of all female cancer in the world as long as incidence and mortality rate were concerned in 2018, with 85% of the 569,847 new cases which occurred in 2018 recorded in developing countries [1,2], however, in the developed countries, it is not among the top ten female cancer [3]. Without preventive strategies, deaths due to CC are projected to rise by almost 25% over the next 10 years [4].

a high CC burden [5], it is the second most frequent female cancer with an incidence of 100 cases/100000 women [6]. Cervical cancer is caused by chronic infection due to Human Papilloma Virus (HPV) which affects 80% of women in during their lifetime [7].

Since 2006, the prevention is possible with the use of prophylactic HPV vaccine before the beginning of sexual intercourse which, when started at an early age is a major risk factor of CC [8]. The implementation of this vaccine which can prevent HPV infection by more than 90% and cervical cancer screening have decreased the rates of CC and improved patient outcomes in high income countries [9,10].

In Cameroon, a sub-Saharan African country, a region which has

In Cameroon, the [10-24] age group represents 31.9% of female

population [11], and many of these adolescents engage in risky sexual activity without protection [12]. In Brazil, 38.7% of female middle school students (adolescent) were sexually active while in Tanzania, it was 40.2%, 17.6% of them had multiple partners [13,14]. In Nigeria, the rate was 77.6% and only 25.4% had ever used any contraceptive method [15].

In Cameroon, 27% of female adolescent had sex with multiple partners and 25% only used condoms [16] and 66% of sexually active female teenagers had a positive HPV-DNA in Brazil [17]. Chen has shown that there was a positive association between medical education, health beliefs and HPV vaccination among female university students in Hong Kong [18].

In Cameroon, little is known about female college-age sexual exposure knowledge and prevention practices related to HPV prevention using HPV vaccine in Cameroon. The aim of this study was to assess the knowledge, attitudes and the vaccination practices against HPV infection in a population of urban and rural middle school girls, the ideal target of CC prevention, to enhance its prevention in a country with a high incidence and mortality due to CC.

Patients and Method

It was a cross sectional Knowledge Attitude and Practice study conducted between January 5th and April 7th 2016 in 10 secondary schools (also called middle school in some results) selected by stratified sampling method, six in Yaoundé, the capital of Cameroon and four in Ndikinmeki, a rural locality and a commercial hop along Yaoundé -Bafoussam high way both cities in the Center Region of the republic of Cameroon in the Gulf of Guinea in Central Africa.

We included female student aged 12 and above, after written consent form by the parents for those who were less than 18 years or themselves when aged 18 years and above. A data collection document was filled through an individual interview.

Knowledge was appreciated through 8 items according to the performance of the group. Attitude was considered as good or bad if in accordance or not with what is recommended in cervical cancer behavior and the level of practice was determined by the effectivity of realization or not of at least one dose of anti-HPV vaccine proven by the vaccination records. The statistical analysis was done using Epi Info version 7.0. Bivariate analysis using the test of Pearson were done to investigate relations between knowledge and attitude and practice, attitude and practice. $p \leq 0.05$ was the threshold of statistical significance.

This study received the authorization from the ethical committee of the University of Douala and the authorizations of all the 10 principals of the selected middle schools.

Results

We included 1313 participants 77.1% (1013/1313) from urban middle school (Yaoundé) and 22.8% (300/1313) from rural middle school (Ndikinmeki). They had middle school form

two to upper six education level, the majority in form 5 in both cities. The medium age was $16.9 \pm 2,7$ the minimum was 12 and the maximum, 29. In Yaoundé, 741 (73.1%) attended grammar school and 270 (26.9%) technical middle school; in the rural town of Ndikinmeki, 242 (60.5%) attended grammar school and 58 (39.5%) technical middle school.

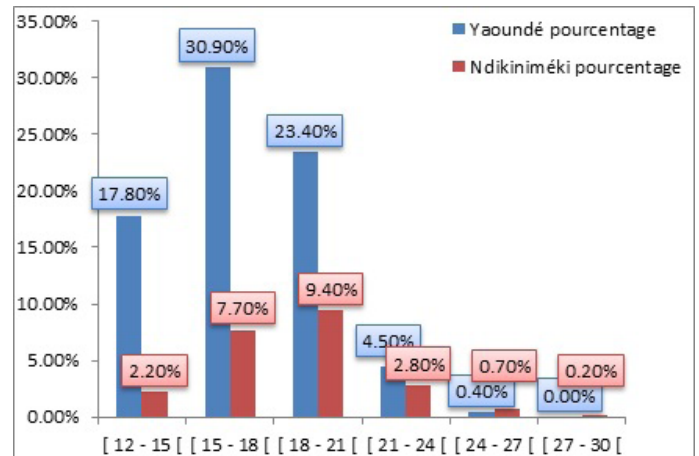


Figure 1: Distribution in urban and rural middle school according to age.

The majority of students were aged [15-18] in urban middle school (Yaoundé) and [18-21] in rural middle school (Ndikinmeki).

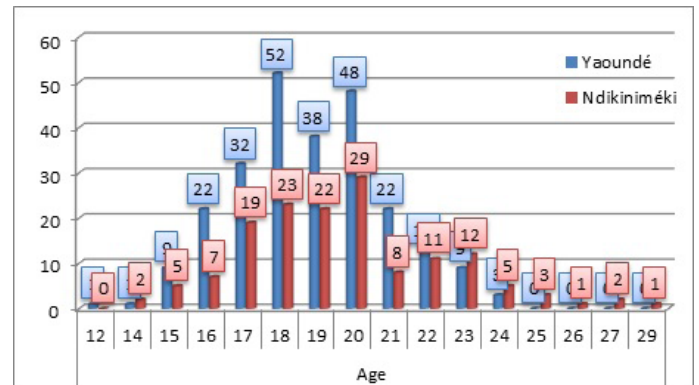


Figure 2: Distribution of sexually active girls according to age.

Four hundred (30.4%) students were sexually active; 14 refused to answer, the youngest was 12 in urban area and 14 in rural area, all the ages were represented.

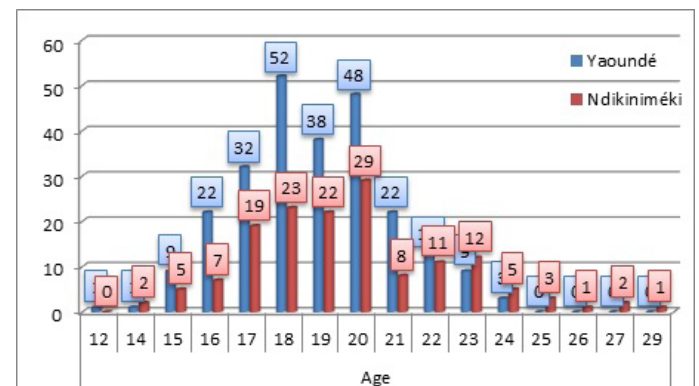


Figure 3: Age of first sexual intercourse.

The youngest age of first sexual intercourse (coitarche) in urban middle school was younger than in rural ones. (12 and 14 years respectively).

Variables		Urban middle school	Rural middle school	N (%)
		n (%)	n (%)	
Intercourse experience	Vaginal sex	241 (60.2)	149 (37.2)	97.4
	+Oral sex	5 (1.2)	1 (0.2)	1.4
	+Anal sex	4(1)	0	1
Condom use	Occasional	113 (28.2)	99 (24.7)	52.9
	Systematic	80 (20)	30 (7.5)	27.5
	Never	57 (14.2)	21 (5.2)	19.4
Talking about sexuality with parents	Necessary and difficult	603 (45.2)	112 (8.5)	53.7
	Useless	207 (15.7)	87 (6.6)	22.3
	Necessary and useful	201 (15.3)	103 (7.8)	23.1
Source of information on HPV vaccine	Media	(30.6)	(8.6)	(39.2)
	Doctors	(18)	(9.33)	(27.3)
	Parents	(8)	(0.6)	(8.6)
	Friends	(6)	(1.3)	(1.9)
	School	(4.6)	(0.6)	(5.2)
	Pharmacist	(1.3)	(0)	(1.3)
	Church	(0.6)	(0.6)	(1.2)

Table 1: Other sexual issues and behaviour.

Sexually active students were mostly engaged in vaginal intercourse (97.4%) but other sexual experience like oral or anal intercourse were adopted by some students mostly in urban area (9/10),72.3%occasionally or never used condom during intercourse, talking about sex with parent was difficult (53.7%), 22.4% found it useless, and media and medical staff were the main source of information on HPV vaccine.

Variables		Urban middle school	Rural middle school	N (%)
		n (%)	n (%)	
Aware of HPV existence	Yes	201 (15.3)	71 (5.4)	20.7
	No	812 (61.8)	229 (17.4)	79.3
Mode of transmission	Good answer			45.1
	Wrong answer			54.9
HPV and cancer relation	Good answer			31.7
	Wrong answer			3.7
	Have no idea			64.5
Aware of vaccine existence	Yes	895 (68.2)	248 (18.9)	87.1
	No	112 (8.5)	39 (2.9)	11.4
	No answer	6 (0.5)	13 (0.9)	1.5
Vaginal*	Good answer	87 (6.6)	87 (6.6)	13.2
	Wrong answer	437 (33.3)	140 (10.6)	43.9
	Have no idea	454 (34.6)	105 (8)	42.6
HPVCC**	Good answer	188 (14.3)	214 (16.3)	30.6

HPVCC**	Wrong answer or don't know	786 (59.9)	125 (9.5)	69.4
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Table 2: Knowleges on HPV and vaccination against cancer of the cervix. *Vaginal smear after HPV vaccination. **HPVCC: HPV can cure CC.

Only 20.7% were aware of the existence of HPV among which 54.9% didn't know about its sexual transmission pattern, but 87.1% had heard about a vaccine against CC.The majority had a bad knowledge on the other items.

Attitudes and Practice

Variables		Urban middle school	Rural middle school	N	(%)
		n (%)	n (%)		
Acceptability of HPV vaccine	Yes	893 (68)	280 (21.3)	1173	89.3
	No	87 (6.6)	53 (4)	139	10.7
Reasons of no vaccination so far	Not aware of its existence	893 (68)	270 (20.5)	1163	88.5
	Cannot financially afford	100 (7.6)	30 (2.2)	130	9.8
Fear of side effects		7 (0.5)	5 (0.3)	12	0.9
Religious belief		3 (0.2)	1 (0.07)	4	0.3
Have no time		2 (0.1)	2 (0.1)	4	0.3
Effective anti HPV vaccine	Yes	11 (0.8)	0	11	0.8
	No	1002 (76.3)	300 (22.8)	1302	99.2
Reasons of anti HPV practice	Parents decision	11/11 (100)*	0	-	-
Parents profession	Medical doctors	7/11 (63.6)	-	-	-
Private companies' manager	4 (36.4)				
Moment of vaccination	Free campaign	11 (100)	--	--	--

Table 3: Attitudes and frequency of anti HPV vaccination among middle school female students.

The acceptability of anti HPV vaccine administration was 89.3%, 10.7 still thought that it was not a good thing for them, the lack of vaccination was due to lack of awareness, only 0.8% of all the girls were vaccinated against HPV infection, a proportion of 1.2% (11/899) when compared to virgin middle school girl. Medical doctors and managers of companies were most likely to send their daughters for vaccination but they all were waiting for free of charge campaign.

Multivariate analysis

There was a significant correlation between HPV vaccine awareness and living in urban or rural areas, urban middle school girls were more likely to be aware of the HPV vaccine (P=0.001), but this was not related to student age (p=0.189) nor the fact of attending grammar or technical middle school (p=0.112).

Awareness of HPV vaccine existence	PC		0.114
	p value		0.001
	N	1313	1313
Urban/rural	PC	0.114	
	p value	0.001	
	N	1313	1313
Age	PC		-0.036
	P value		0.189
	N	1313	1313
Awareness of HPV vaccine existence	PC	-0.036	
	P value	0.189	
	N	1313	1313
Age	PC		-0.44
	p value		0.112
	N	1313	1313
Grammar/ Technical school	PC	-0.044	
	p value	0.112	
	N	1313	1313

Table 4: Statistical correlation between place of residency, age the school system with HPV vaccine awareness. PC: Pearson correlation.

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Discussion

Cervical cancer is a preventable sexually transmitted disease if HPV vaccine is administered before the first sexual intercourse. Once oncogene HPV is transmitted, early detection of premalignant lesions can reduce the expected rise by almost 25% over the next 10 years [4]. Adolescence is the period of puberty characterized by body changes discovery of sexuality and initiation [19]. Adolescent usually engage in risky sexual behavior and a greater risk of sexually transmitted infections [12,20] and they are the ideal and sole target of optimal pharmacological prevention.

Sexual exposure

Early age of first intercourse is associated with an increased risk of cervical pre-malignant lesions and CC in developing countries [21-22]. This study has shown that 30.4% of middle school female student were sexually active and earliest first sexual intercourse was at 12 years and was in urban school (Figures 2 and 3). This result is higher than the 9.6% and 22.1% found in studies in Kenya and southern Nigeria respectively, however, the authors did not discuss this low percentage [23-24]. It was lower than the 72.4% of unmarried secondary school girls aged 15-24 [25], but close to the 38.7% in Brazil [13].

The proportion of sexually active female secondary school students varies from one study to another and from one community to another [26]. This study did not investigate the context of first

intercourse and it is one of its limitations, but according to Udigwe et al. in southern Nigeria, a country culturally similar to Cameroon, pressure from partner, financial reward or forced sex are frequent [27]. In this same country, gender, age and sociological factors like peer group pressure, media, family and teacher influence could affect the sexual behavior of secondary school students [28]. Nigatu identified among other determinants the marital status, alcohol use or watching pornographic videos [25]. Other studies have mentioned the role of religion [29]. According to an American study, making a private pledge or promise to oneself to wait to have sexual intercourse until wedding could reduce the likelihood that adolescents will engage in sexual intercourse and oral sex [30], and pledgers who subsequently initiated sexual activity were three times as likely to deny having made a pledge as those who did not initiate sexual activity [31].

The earlier sexual practice found in our study may be attributed to many factors including internet pornography as the use of smartphones with easy and cheap internet access in this country without any restriction. Some pornographic television (TV) channels are officially provided in official TV package. In a bigger town like Yaoundé, pornographic DVD (digital video disc) are publicly exposed with very suggestive pictures, which can be seen by anyone passing-by, including secondary school students. This probably explains why in a rural locality like Ndikinmeki, the beginning of sexual activities was delayed and the practice of “unusual sexual behaviors” like fellation and sodomy were observed mainly among urban female students with claims of difficulties to learn about sexuality from the parents (Table 1). Urban residence had been confirmed by other studies as influencing sexual behavior [32]. Only 27.5% of sexually active female students systematically used condoms the other protective device against HPV infection (Table 1) in accordance with the risky sexual behavior known to adolescents as previous studies have shown [15,24].

Knowledges on HPV vaccine

Amid this risky sexual exposure behavior context, the overall knowledge on anti HPV vaccine was bad, as found in recent low-income countries the existence of HPV was basically unknown few knew the relationship between HPV and CC, and only one third knew that HPV vaccine couldn't treat declared CC and this was not related to student age or attending grammar or technical secondary school (Tables 2 and 4; $P=0.189$ and 0.112). The level of knowledge on HPV vaccination is not constant in recent publications. It was from 7.8 to 97.5% in a South-East Asia systematic review, the lowest found among women in rural Malaysia whereas the highest among vaccination service users [33]. The same disparity was observed in a meta-analysis in Europe where the level of awareness varied from 5 to 92% [34]. Many factors can affect the level of knowledge but being a female secondary student was none of those numerous identified factors [33].

An unusually high level of knowledge was found in rural Malaysia certainly due to the fact that 89.8% of female respondents had been vaccinated against HPV and had received the sensitization package

before vaccination [35]. The notion of vaccination against HPV is relatively recent (2006). Without the opportunity of “conditionnal sensitization” due to one reason or another, the level of awareness can be low or high even in high income environment as these meta-analyses have confirmed [33,34,36]. Living in Yaoundé the capital city with greater opportunities of information/sensitization was statistically higher than in rural Ndikinmeki (Table 4, P=0.001). The main source of information on HPV vaccine being medical staff and media, the parents playing a lesser role. This is probably due to the difficulties to talk about sex with them (Table 2). Studies have indeed found that knowledge deficit may reflect a failure to impart an effective message to the target group [37].

Attitudes and effective HPV vaccination uptake

The acceptability was high (89.3) (Table 3). The attitude towards HPV vaccination is usually good in the literature, but some studies have shown mixed acceptability. In a study concerning medical students in Nigeria, only 39.6% fully accepted HPV vaccination, the reason being Inadequate information and high costs [38]. Similarly, this study also identified fear of side effects and religious belief or lack of information on HPV vaccine. Even in high income environment like in the United Kingdom, a study focusing on girls aged 17-18 years found that concerns about the efficacy and safety of the vaccine, mistrusts on the information provided could also influence HPV vaccine acceptability [39].

The frequency of effective HPV vaccine uptake was one of the lowest in the recent literature (0.8%), as found in low income settings [40]. It is usually higher in high income environment [35,40]. But in a Hong Kong, a high-income setting, a study concerning female university students found that only 9.7% were vaccinated, the main limitation being the cost of vaccination [18]. In our context, the hypothesis stating that the very low uptake is probably related to poverty/financial accessibility, non-existence of efficient community orientated CC preventing program implementation including focused sensitization remains to be confirmed, the latter probably playing an important role. All the 11 vaccinated young girls had medical staff or corporates parents, but although not mentioned in this study, many other non-vaccinated girls had parents with the same profile. This shows probably the magnitude of the sensitization to be conducted by the medical authorities to slow down the incidence of what remains the second female cancer in this yet high CC prevalence country.

Conclusion

The proportion of sexually active secondary school girl student was important (39.4%), but lower than higher frequencies found in the literature, the first intercourse was early (12years), and sexually active students had a risky sexual behavior, and attending urban secondary school was a promoting factor, including uncommon sexual behaviors with the probable influence of pornography. Nonetheless, the knowledge on anti-HPV vaccine was bad no matter the secondary school background or student's age amid probable lack of sensitization program. Although the overall attitude towards the vaccine was good, the frequency of effective HPV vaccine uptake was one of the lowest in the recent

literature (0.8%). Sensitization on HPV and CC relationship and accessibility of anti-HPV vaccine still has a long way to go for effective prevention of CC in high CC frequency settings.

Limitations

The sexual aspects still taboo in our context of this study might have brought some bias reducing the real magnitude of some sexually related content. The cross-sectional design didn't allow to confirm some causes of some findings.

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