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EFFECT OF IUD (INTRAUTERINE DEVICE) ON REPRODUCTIVE TRACT INFECTION (RTI) IN THE NORTHERN WEST BANK

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Abstract

***Background*:** Intra uterine device (IUD) is one of the most popular methods of contraception among Palestinian women. Reproductive Tract Infection (RTI) is one of the main problems associated with IUD use. The objective of this study is to explore the relationship between RTI related symptoms & IUD use.

Methods: We interviewed two hundred women (134 IUD users and 66 non-IUD users) from Ministry of Health (MOH) family planning (FP) clinics in Northern West Bank/Palestine. A questionnaire about RTI related symptoms was filled, then cervical swab samples were collected & cultured for aerobic bacteria. A scoring system for vaginal discharge symptoms and overall RTI related symptoms was developed, all data were analyzed using SPSS software.

Results: High number (87%) of women in the study reported vaginitis or RTI symptoms. There was a significant difference in alteration of vaginal discharge (*P*=0.003), and presence of RTI related symptoms (*P*=0.000) among IUD users in comparison to non-users. However there was no statistically significant relationship between alteration of vaginal discharge and type of isolated bacteria (P=0.266), nor was a relation between RTI related symptoms and IUD type (*P*=0.568).

Conclusion: Vaginitis and RTI are common problems among women in Palestine, with a high association between IUD use and these types of infection. A protocol for diagnosis and treatment needs to be developed by MOH and other health organizations in Palestine.

Key words: RTI, vaginitis, IUD users & non-users, Palestine

Introduction

IUD is one of the most popular contraceptive methods used world wide, the most common type is Copper IUD [1]. Different studies were conducted to explore the IUD related diseases particularly those associated with infection. Some studies linked the infection-related disease to the insertion method and technique [2, 3, 4, and 5].

Reproductive tract infections (RTI) are common among women all over the world. They include three types; the" sexually transmitted disease" , the endogenous infection caused by over-growth of organisms present in the genital tract such as bacterial vaginosis, and finally infections associated with medical procedures that manipulate the genital tract as unsafe abortion, pelvic examination, and IUD insertion [6].

Vaginitis is inflammation of the vagina characterized by discharge, irritation and or itching, [7, 8]. Bacterial Vaginosis is one of the most common causes of vaginitis in women of childbearing age. In symptomatic women the percent reaches up to 24-37% and it has been found in 16-29% of pregnant women. Evaluation of the epidemiological factors revealed that IUD use and douches are common among women with Bacterial Vaginosis [8, 9].

Vaginal micro-flora are opportunistic bacteria, these bacteria as streptococci, staphylococcus, Escherichia-Coli, are vaginal habitat. Ohm, in his study [10]classified them into two groups; the first is the predominant bacteria like *Staphylococcus epidermidis*, the other group is the potentially pathogenic, (*Staphylococcus aurous*, *E-Coli*, *Streptococcus group A*).

The importance of studying the aerobic bacterial microorganism [11]as E-Coli lies on fact that these organisms are opportunistic pathogens in the female genital tract and are associated in the pathogenesis of UTI. Also *Staphylococcus aurous* has its role in developing toxic shock syndrome.

Materials and Methods

1- Sample Selection: The study population consisted of women visiting government family planning clinics in the four northern West Bank districts (Nablus, Qalqelia, Jenin, and Tulkarm). Women were either requesting IUD insertion, or already using IUD and visiting the clinic for check up. The study sample was randomly selected (Every third woman visiting the clinic was included in the study) with the following exclusion criteria:

1. Heavy blood during menstrual period at the time of sample collection

2. antibiotic use during previous 15 days.

3. Diabetic patients.

The study clinics were the four central clinics in northern West Bank run by MOH. These clinics were selected because of the high utilization rate (> 50 women/ per month).

The annual report of these clinics in 1999 showed that the total number of clients in the four districts were (2439), ranking as, 1199(49%), 700 (29%) 300(12%), 240(10%), for Jenin, Nablus, Tulkarm, and Qalqulia respectively. Therefore, the study sample consisted of a total of 200 women according to the total utilization rate of the clinic in each district, Jenin: 98 women (49%), Nablus 58 women (29%), Tulkarm 24 women (12%), and 20 women from Qalqulia (10%). This distribution made the sample representative of women utilizing family planning clinics.

The aim of this study is to explore the presence of RTI symptoms among Palestinian women using IUD. The study also aims at finding a relationship between these symptoms and IUD use, duration, and type.

2- Data Collection: Data were collected between September 2000- January 2001 using structured interview and cervical swab specimen collection.

A- Instrument: A structured questionnaire interview was the main instrument. The Questionnaire was developed and piloted on 10 women, and it consisted of two parts; the first focused on socio-demographic characteristics of respondents in terms of women's age, education, occupation and years of schooling. The second part was about previous history of genitourinary tract infection, and the current signs and symptoms of vaginitis in the form of vaginal discharge, its color, odor, and consistency, the presence of associated symptoms such as itching, burning, lower abdominal pain, and painful intercourse.

The purpose of the study was explained for each woman and informed consent was also signed. Serial number was used, and each woman was given the same serial number on the filled questionnaire and the swab culture container.

A scoring system approach was developed to evaluate the clinical picture of the participants in terms of RTI symptoms. Vaginal discharge and its characteristics such as itching, and burning were used as indicators for vaginitis. Absence of symptoms was given 0 score, 0.5 score for 1-2 symptoms, 0.75 score for 3-4 symptoms, and 1 score for more than 4 symptoms.

The severity of infection was evaluated according to the presence of other symptoms such as abdominal pain, dysparaunia, fever, itching and burning. A score system for severity of symptoms was also developed with 0 score indicating no symptoms, 1(mild) for 1-3 symptoms,2(moderate) for 4-6 sypmtoms, and 3(severe) for more than 6 symptoms.

B- Laboratory analysis: An Endo-cervical specimen for culture using a sterile cotton swab was obtained while women were undergoing vaginal exam. The swab was inserted in the cervix and pulled around for 60 seconds and then put in wet media (Stewart Emma media) for transport. In the lab the specimens were cultured on a blood and Macchonky agar for 24 hours at 37◦C.

3- Data analysis: All the data collected through the questionnaire and results of the laboratory tests were entered and computed using Statistical Package for Social Sciences (SPSS) version 10.0 software and applying Chi-Square test with $p = 0.05$ level of significance.

Results

Sociodemographic profile of the population study: The age of study sample ranges between the 19-45 years old, more than half were in the 20-30 age group comprising 52.2% of IUD users, and 66.6% of nonusers). The age group >40 was from the IUD users only, since the non-users were all selected from women attending clinics to have IUD inserted.

Table1: **Social and demographic profile of population study**

	Category	IUD users		Non-users	
		No.	%	No.	%
Age (years)	**<20**	1	0.8	5	7.6
	20-30	70	52.2	44	66.6
	31-40	56	41.8	17	25.8
	>40	7	5.2	0	0
	Total	134	100.0	66	100.0
Woman's Education	**Elementary**	31	23.1	4	6.1
	Preparatory	39	29.1	22	33.4
	Secondary	49	36.6	30	45.4
	College	15	11.2	10	15.1
	Total	134	100.0	66	100.0
Woman's Occupation	**Housewife**	112	83.6	59	89.4
	Working	22	16.4	7	10.6
	Total	134	100.0	66	100.0

The majority of women in the study sample had some education, but only small percent had college education (11.2% of IUD users, and 15.1% of non-users). Most of women in the study were housewives.

Frequency of reported RTI related symptoms: Table 2 shows that only 26(13%) of women in the study had no symptoms, they were almost equally divided between the two groups in the study (54%) were IUD users, and (46%) non-users. The most frequently reported symptom was the presence of vaginal discharge (a total of 159 women), the majority of whom (73%) were IUD users. All other symptoms were present in both IUD users and nonusers, but were reported in a much higher frequency among IUD users.

Vaginal discharge and the use of IUD: Table 3 shows the relationship between the vaginal discharge, its characteristics and the use of IUD. There was no statistical difference among non IUD users in regards to vaginal discharge characteristics, however the majority of IUD users had significant high scores of altered vaginal discharge .The differences in alteration of vaginal discharge was statistically significant when comparing between IUD users and non users (P=0.003).

Table 3 also shows the relationship between vaginal discharge characteristics and culture results. Overall there was no significant difference between positive culture results and

vaginal discharge characteristics (P=0.54), nor was a significant difference of bacterial types and vaginal discharge characteristics (P=0.266).

Table 2: Frequency of reported symptoms according to IUD use

Symptom	IUD users		Non-users		Total*	
	No.	%	No.	%	No.	%
Vaginal discharge	116	73	43	27	159	100
Lower abd. pain	75	82.4	16	17.6	91	100
Odour	62	73	23	27	85	100
Dysparaunia	50	84.7	9	15.3	59	100
Itching	46	75.4	15	24.6	61	100
Burning	34	73.9	12	26.1	46	100
Fever	10	66.7	5	33.3	15	100
No symptoms	14	54	12	46	26	100

* Note: The total number of IUD users having symptoms will add to more than 134, and non users to more than 66 because the same woman has more than one symptom.

Table 3: Alteration of vaginal discharge according to IUD use and relation of the vaginal discharge score to culture results

Item	Vaginal discharge score*					Total	P value
IUD use		0*	0.5*	0.75*	1.0*		
Non-users	No.	23	12	18	13	66	0.198
	%	34.8	18.2	27.3	19.7	100	
IUD users	No.	18	30	39	47	134	0.003
	%	13.4	22.4	29.1	35.1	100	
Total	No.	41	42	57	60	200	0.003
	%	20.5	21	28.5	30	100	
culture results	Vaginal discharge score*					Total	P value
		0	0.5	0.75	1.0		
No growth	No.	20	15	13	24	72	0.000
	%	27.8	20.8	18.1	33.3	100	
Pathogenic	No.	7	16	18	18	59	0.000
	%	11.9	27.1	30.5	30.5	100	
Predominant	No.	14	11	26	18	69	0.000
	%	20.3	15.9	37.7	26.1	100	
Total	No.	41	42	57	60	200	**
	%	20.5	21	28.5	30	100	

*Score of vaginal discharge given according to presence of 1-4 symptoms

** P value=0.54 when comparing vaginal discharge scores with presence or absence of bacterial growth, and =0.266 when comparing vaginal discharge score with type of bacterial growth

Severity of RTI related symptoms and IUD use, duration, and type of IUD: Table 4 shows that more than two third of IUD users have moderate and severe symptoms, where majority of non-IUD users had mild or no symptoms. There was statistically significant relationship between the presence and severity of symptoms and IUD use (*P*=0.001), but no significant relationship with type of IUD (*P*=0.568). Regarding the duration of IUD use, there was tendency to have milder symptoms with longer IUD use (P=0.000) except for the first year of use when there was no significant difference between the duration and severity of symptoms (*P*=0.572).

Discussion

According to the Palestinian statistical bureau survey, it was found that IUD is the most popular method among other contraceptive methods; the overall ever use rate was (38.2%), and current use is 47.6%. At the same time most of users start to use IUD after having the 3rd child [12]. In our study (Table 1) more than half of the study population of IUD users (52.2%) was in the age group of 20-30 years, just 0.8 % was below 20 years old. This reflects the national policy of the FP program in the MOH, which does not prefer to apply the IUD to young age, or to nulli-para women. And also goes along with the Palestinian statistical bureau 2000, which states that the percent of women who are currently using IUD at the age below than 20 is 3.7 % [12].

Table 2 shows that the presence of vaginal discharge was the most frequent complaint among women in our study, particularly IUD users. Similar findings were reported by Hawkes, who described vaginal discharges as one of the most common clinical complaint among women of reproductive age in many parts of the world [13].

Our study shows high prevalence rate of symptoms related to RTI among women attending FP clinics. This finding was particularly high among the IUD users, either that related to alteration of vaginal discharge (86.6%), or symptoms related to RTI (91%), see tables 3, and 4.

Studies in other parts of the world revealed similar association between vaginitis, and use of IUD. Sieber et al [7] and Amsel found a strong association of nonspecific vaginitis with the use of IUD [14]. Some studies were done to explain this association between IUD use and vaginitis symptoms. Beerthuizen referred to the presence of IUD as a foreign body, which causes reaction to the host and response of endometrial tissue to the device similar to foreign body reaction [15]. The change in the normal vaginal bacteria flora was another explanation. Egan reported that 40-50% percent of American women complains of vaginitis, and the most common bacterial organisms were Gardenella, Mycoplasma, and Streptococcus [9].

Table 3 shows a statistically significant relationship between vaginal discharge alteration and the presence of aerobic bacteria whether predominat or potentially pathogenic. In support of this relationship, Hawkes found in his study that endogenous infection (Candida, bacterial vagnosis) was diagnosed by laboratory in 32% of symptomatic women, method of contraception was the only significant factor with endogenous infection & 53% of which was among IUD users [13]. Although there is significant association between IUD use and symptoms of vaginitis and RTI, different studies around the world point to the safety of IUD use and low rate of IUD discontinuation. The IUD continuation rate in a Libyan study was 96.1%, although increased nonspecific vaginitis (NSV) was one of the main medical complication in that study [16]. An analysis of World Health Organization trials including over 22,000 women found that the primary risk of PID with IUD use occurs within the first 3 weeks after insertion; thereafter the risk declines to baseline levels and remains low [17].The effect of duration of IUD use on RTI related symptoms in our study showed an overall tendency to have milder symptoms

Table 4: Relationship between severity of symptoms, and IUD use, type and duration of IUD

IUD use	Count %	Score of Symptoms				Total	P value
		No	Mild	Moderate	Severe		
IUD users	No.(%)	12(9)	33 (24.6)	68 (50.7)	21 (15.7)	134 (100)	0.000
Non-users	No.(%)	14(21.2)	29 (34.9)	19 (28.8)	4 (6.1)	66 (100)	0.000
Total	No.(%)	26(13)	62 (31)	87 (43.5)	25 (12.5)	200 (100)	0.001
Type of IUD	**Count %**	**Severity of Symptoms**				**Total**	**P value**
		No	**Mild**	**Moderate**	**Severe**		
Multi-Load	No.(%)	4 (14.8)	10 (37)	10 (37)	3 (11.1)	27 (100)	0.568
Copper-T	No.(%)	8 (7.5)	40 (37.4)	39 (36.4)	20 (18.7)	107 (100)	
Total	No.(%)	12 (8.9)	50 (37.3)	49 (36.6)	23 (17.2)	134 (100)	
Duration of use/month	**Count %**	**Severity of Symptoms**				**Total**	**P value**
		No	**Mild**	**Moderate**	**Severe**		
<12	No.(%)	7 (11.1)	21 (33.3)	24 (38.1)	11 (17.5)	63 (100)	0.572
13-24	No.(%)	1 (3.1)	16 (46.9)	12 (37.5)	4 (12.5)	32 (100)	0.000
25-36	No.(%)	3 (14.3)	6 (28.6)	9 (42.8)	3 (14.3)	21 (100)	0.000
>36	No.(%)	1 (5.6)	8 (44.4)	4 (22.2)	5 (27.8)	18 (100)	0.000
Total	No.(%)	12 (8.9)	50 (37.3)	49 (36.6)	23 (17.2)	134 (100)	0.000*

* Overall P value for relation between Duration of IUD use and severity of symptoms

with longer IUD use (P=0.000).The findings in the first year of use were not statistically significant (P=0.572),in spite of having higher rate of symptoms during that period .

Although IUD has been related to RTI, a study in six countries including Egypt and Tunisia about contraceptive method discontinuation showed that IUD users were less likely than users of hormonal methods to stop because of health or side effects and were less likely to report method failure [18] .

In a study about qualitative research for RTI conducted in Egypt by the Population Council, it was determined that 51% of the women had RTIs [19]. Table 4 in our study shows that 87% of women had at least one or more symptoms related to RTI. Although these symptoms were much more common among IUD users, these results are pointing to an important and common problem in our society.

Different approaches are followed all over the world to diagnose, treat and manage the symptoms related to RTI at the level of Primary Health Clinic either in the Family Planning or Maternal &Child Health clinics, examples are culture swab, gram stain, Amsel criteria, or syndromic approach that have been developed by WHO. Syndromic approach have proven to be so effective in poor countries with high prevalence rate of STD, and where limited services are available for use in the diagnosis [13].

Conclusion

Vaginitis and RTI are common problems among women in Palestine. There is a special important association between IUD use and these types of infection. Although symptoms are important in clinical evaluation of these infections, the type of aerobic microorganism cannot be predicted by these symptoms. Health workers in the family planning and primary health care clinics should be aware of vaginitis, and the different types of RTI, their proper diagnosis, prevention and treatment, and the association of these infections with contraceptive methods. Teaching and training of these health workers about taking the available opportunities during FP and PHC clinic visits is an important step .A study in Bangladesh found that RTIs are important health problems that affect women of reproductive age but often remain unexplored in the current service delivery system. Furthermore clinicians failed to elicit necessary reproductive health information from clients, across all types of clinics [20]. A protocol for diagnosis and treatment needs to be developed by MOH and other health organizations in Palestine.

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