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FACTORS AFFECTING COMPLICATIONS OF COPPER INTRAUTERINE CONTRACEPTIVE DEVICE

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ABSTRACT

Background: Intrauterine contraceptive devices (IUCDs) offer a safe and effective method of fertility control, comparable to female sterilization and Norplant. However, they have risks, including rare adverse reactions like endometritis, spontaneous abortion, and septicemia. Factors influencing IUD performance include age, parity, education, breastfeeding status, delivery type, and provider skill. Careful patient selection and pre-insertion counseling are crucial for IUCD acceptance. **Aim of the study:** To determine the events rates related to intrauterine contraceptive device insertion among IUDs users following insertion in Mosul city / Iraq. **Patients and Methods:** A Cross sectional study was conducted among 267married women who currently use copper IUCD a attended the obstetrical and gynecological department of the Al-Khansaa, Al-Salaam, and Al-Batool Teaching Hospitals during the period of 6 months from the first of February, 2021 to the end of July, 2021. The married women were asked about their experience with this method. Any problems related to the insertion procedure was recorded and also during follow- up checking visit. After data collection, the statistical analysis was done by using Minitab program. **Results:** The study analyzed the distribution of women requesting IUCD insertion based on socio-demographic characteristics, reproductive history, and pain levels. The majority were aged 20-30, with 47.6% having level education between 7 and 12 years. Most were not workers, with 49.1% breastfeeding and 50.9% bottle feeding. Most were delivered by NVD, with 88.4% using Cesarean section. The study found a significant association between menstrual bleeding amount and duration, with women with a history of infection more likely to develop menstrual changes. **Conclusion:** Device insertion causes 19.9% of events, including pain, bleeding, laceration, syncope, and perforation, with previous Cesarean section delivery being the most risk factor. Adverse experiences include bleeding, menstrual changes, and pregnancy.

KEYWORDS: Complications, Copper, IUCD.

INTRODUCTION

The intrauterine contraceptive device (IUCD) provides a relatively safe method of fertility control when compared to the morbidity and mortality rates associated with pregnancy and associated with the use of other methods.[1] IUDs are highly effective, safe and relatively inexpensive methods of contraception which may offer advantages for some women over other long term methods, and provides protection against pregnancy comparable to that provided by female sterilization and Norplant. IUDs have a long duration of effectiveness as copper T is effective for at least 10 years.[2] However, there are some risks associated with any method of birth control. Serious problems associate with the use of the IUDs are rare, but they do happen.[2, 3]

Events occurring at the time of insertion and complications afterwards are rarely studied especially for multiparous women for whom, IUDs are most suitable. These events although rare, cause personal distress, embarrassment, and inconvenience and can have a negative impact on IUCD acceptance.[1,3] Thus even a rare event may have important public health implications. To avoid such occurrence, the risk factors of these rare events need to be delineated and careful patient selection and pre- insertion counseling are crucial to form the basis by which health personnel inserting IUCD, can improve the quality of care for women requesting a device for contraception.[3, 4]

Reported adverse reactions with intrauterine contraceptives include: endometritis, spontaneous abortion, septic abortion, septicemia, perforation of uterus and cervix, fragmentation of the IUD, pelvic infection, tubo-ovarian abscess, tubal damage, vaginitis, cervical erosion, pregnancy, ectopic pregnancy, complete or partial expulsion of the IUD.[5, 6] Anyway, common side effects have not been serious, and the serious side effects have not been common.[7, 8]

Various factors influence IUCD performance and the related problems associated with it. These factors may include age, parity, education, breast feeding status, type of delivery, the length of time since termination of last gestation, expressed purpose (spacing or limiting), type of IUCD used and the provider's skill.[7-9]

Aim of the study: To determine the events rates related to intrauterine contraceptive device insertion and to outline the rates of adverse experiences among IUDs users following insertion in Mosul city/ Iraq.

PATIENTS AND METHODS

Study setting: The present study was conducted among married women who currently use copper IUCD and they attended the obstetrical and gynecological department of the Al-Khansaa, Al-Salaam, and Al-Batool Teaching Hospitals during the period of six month extended from the first of February, 2021 to the end of July, 2021. The Obstetrics and Gynecology Department in each of these hospitals provides its services to many areas in the city of Mosul and contains consulting rooms, emergency lounges, labor lounges, an operation theatre, and receives patients from inside and outside the city, or private clinics or referred from primary health care centers distributed throughout the city of Mosul. It is staffed by obstetricians and gynecologists, family physicians with a full staff of nurses and others.

Study design: Cross sectional study with an analytic element was conducted in order to identify the factors affecting complications of copper IUCD.

Study sample: The data were collect from 267 married women already using copper IUCD at the time of research.

Source of data and Data collection

All the data were entered into standardized questionnaire. Verbal consent was obtained from these women through direct interview with researcher asking them about their experience with this method. We record any previous problem before insertion (menstrual history, contraceptive history and any problem prior to insertion like lower abdominal pain, bleeding, infection, dysmenorrhea, backache and other problem). Any problems related to the insertion procedure was recorded like pain bleeding, and also during follow- up checking visit. Results were put down in the questionnaire. we also study factors that may affecting IUCD insertion like (age, parity, occupation, level of education, breast feeding, type of last delivery and time interval between end of last gestation and IUCD insertion. The researcher had made regular visits to site of research for data collection in system of 2 day per week, from 9 a.m. to12 p.m. and for 6 months. The study included all married women currently using IUCD who were healthy, sexually active, at the reproductive age group, had at least one child, and using the copper type of intrauterine contraceptive device. While the using hormonal IUCD were excluded.

Statistical analysis: After data collection, the statistical analysis was done by using Minitab program. Frequency distribution for selected variables was done first. All data arranged and tabulated in number and percent. An association were estimated by Chi square test and considered statistically significant when the P value was <0.05.

RESULTS

The distribution of women requesting IUCD insertion according to the socio-demographic characteristics shown in the table number (3.1). The result shown in this table illustrate that the majority of women involved in this study 48% at age between 20 and 30 years. While only 5.6% less thanage of 20 years, the means of this study (SD) equal to 30.74±6.8. The educational level of our sample show that the great percent 47.6% had level education between 7 and 12 years, the mean was 8.14±3.9 years. About 90% of our sample are not workers and only 10% are workers. In this table 49.1% of women are breast feeding and 50.9% are bottle feeding.

Table (1): Distribution of the study sample according tosocio-demographic characteristics.

Parameter		Number (n=267)	%
Age(years) / mean= 30.74 ± 6.8	< 20	15	5.6
	20-30	129	48.3
	30-40	102	38.2
	> 40	21	7.9
Education (years)/ mean =8.14 ± 3.9	0-6	107	40.0
	7-12	127	47.6
	> 12	33	12.4
Occupation	Not worker	238	89.1
	Worker	29	10.9
Breast feeding	Yes	131	49.1
	No	136	50.9

The distribution of women requesting IUCD insertion according to their reproductive history are shown in table (3.2). The majority of women 88.4% delivered by NVD, and the rest 11.6% by C/S. In this study the major percent 37.1% is represented by women with interval between the end of last gestation and insertion of IUCD of less than 6 months and 66.3% of women insert IUCD between 3-7 day of menstruation and 12% of women were amenorrhoiec at time of insertion, and 6.7% of women presented with heavy bleeding with clot before IUCD insertion. 31.5% of women had a history of dysmenorrhea before insertion.

Table 3.2: Distribution of women requesting IUCD insertion according to their reproductive history.

Parameter		Number(n=267)	%
Type of last delivery	NVD	236	88.4
	CS	31	11.6
Open interval (months)	< 6 months	99	37.1
	6-12 months	55	20.6
	12-24 months	45	16.9
	24-36 months	18	6.7
	36-48 months	10	3.7
	48-60 months	8	3.0
	> 60 months	32	12.0
Day of IUCD insertion	< 3	13	4.9
	3-7	177	66.3
	> 7	45	16.9
	Amenorrhea	32	12.0
Amount of menstrual bleeding	Normal	201	75.3
	Scanty	24	9.0
	Heavy	24	9.0
	Clots	18	6.7
Menst. duration	< 3 days	57	21.3
	3-7 days	205	76.8
	> 7 days	5	1.9
Dysmenorrhea	Yes	84	31.5
	No	183	68.5

The distribution of the events related to the insertion of IUCD in 267 women shown in the table number (3.3). The great percent of women 49.4% had no pain during insertion followed by 36.3% of women had mild pain and only small percent 1.2% had severe pain during insertion procedure.

Table 3.3: Distribution of the events related to the insertion of IUCD in 267 women.

Parameter		**Number (n=267)**	**%**
Pain	Mild	97	36.3
	Moderate	35	13.1
	Sever	3	1.2
	Non	132	49.4
Bleeding	Mild	62	23.2
	Moderate	6	2.2
	Sever	3	1.2
	Non	198	74.2
Syncopal attack		4	1.5
Failure of insertion		2	0.75
Cervical laceration		0	0.0
Uterine perforation		0	0.0

A comparison between women reported heavy and/or prolonged menstruation at follow-up visit with history of the same complaint pre- insertion and those with the same complaint at follow up but without such a history was done and results showed a highly statistical significant association ($P \leq 0.000$) for menstrual bleeding amount but no statistical significant association ($P>0.05$) for menstrual bleeding duration between the two groups with those with positive history were more likely to develop menstrual changes than those without history (odds ratio 13.4, for menstrual bleeding amount and 7.3 for menstrual bleeding duration) as shown in table (4). Also statistical significance difference was obtained in those women with prior history of infection when we compared them with those who gave no such problem prior to insertion. ($p<0.011$) odds ratio of 2.6. A highly

statistical significant difference was found between those who developed lower abdominal Pain at follow up visit and had history of LAP pre insertion and those who developed it without such a history (p≤0.000), odds ratio=5.3. On comparison those with pre insertion complaint of backache with those without such a history, a highly statistically significant relationship was obtained (p≤0.000) odds ratio=7.6.

Table 4: Distribution of women with adverse events reported during follow-up who had pre-insertion history (+) or no history (-) of the same events.

Variables	With events No.	Total	True (%)	p-value of Chi^2 test	OR (95% C.I)
Menst. of > 8days. Previous history (+) no previous history (-)	1 * 32 **	2*** 265****	50% 11.9%	0.586	7.3 (0.4-119.3)
Total	33	267	32/267=11.9		
Clots & heavy menstruation Previous history(+) No previous history(-)	31 64	37 230	83.7% 27.8%	0.000	13.4 (5.3-33.6)
Total	95	267	64/267=23.9		
Infection Previous history (+) No Previous history (-)	14 54	32 235	43.7% 22.9%	0.011	2.6 (1.2-5.6)
Total	68	267	54/267=20.2		
LAP Previous history (+) No Previous history (-)	16 52	25 242	64% 21.4%	0.000	5.3 (2.3-12.6)
Total	68	267	52/267=19.4		
Backache Previous history(+) No Previous history(-)	48 48	68 199	70.5% 24%	0.000	7.6 (4.1-14.0)
Total	96	267	48/267=17.9		

Patients had previous old problem; **Patients had only new problem; ***Patients had previous old problem which continue after insertion of IUCD; ****patients after excluding those which had previous old problem that continue after insertion of IUCD.

To delineate the risk factors associated with events related to IUCD insertion in the present study, a comparison was done between the 53 women who had problems during the insertion procedure [in which we measure moderate to severe pain, moderate to severe bleeding, syncopal attack, and cervical laceration] and those without. Statistically significant associations were found in the rate of events at insertion by type of delivery (P ≤ 0.05) with those delivered by Cesarean section had more problems which is shown in table (5).

Table 5: Distribution of women according to factors associated to the problems related to IUCD insertion.

Factors associated to the problems related to IUCD insertion		Total (n=267)	Had problem(n=53)	%	P - value*
Age (years)	< 20	15	3	20.0	0.848
	20-30	129	23	17.8	
	30-40	102	23	22.5	
	> 40	21	4	19.0	
Education (years)	0-6	107	23	22.4	0.794
	7-12	127	23	18.2	
	>12	33	7	21.2	
Parity	1-2	81	19	23.4	0.702
	3-5	136	24	18.3	
	6-8	42	9	21.4	
	> 8	8	1	12.5	
Open interval **	< 6 months	99	15	16.1	0.300
	6-12 months	55	13	23.6	
	12-24 months	45	8	17.7	
	24-36 months	18	2	11.1	
	36-48 months	10	2	20.0	
	48-60 months	8	2	25.0	
	> 60 months	32	11	34.3	
Delivery type	NVD	236	41	17.3	**0.005**
	C/S	31	12	38.7	

Day of insertion	< 3	16	4	25	0.628
	3-7	200	37	18.5	
	> 7	51	12	23.5	
Type of last contra.	Hormonal	95	20	21.1	0.194
	IUCD	26	6	23	
	LAM	50	6	12	
	Others	47	14	29.7	
	Non	49	7	14.2	

*Chi-square test has been used; **open interval between the end of last gestation and insertion of the IUCD.

DISCUSSION

The major problem associated with IUDS as a method of contraception is the high discontinuation rate, however this is generally better than those for any other reversible contraceptive method, for example, they compare favorably with those for oral contraceptives. The basic problems causing these high discontinuation rates are increased menstrual bleeding or spotting, pain, expulsion soon after insertion, and a slightly increased frequency of pelvic infection as reported by Sanders *et al.*,[10] Also Higgins *et al.*,[11] found that such problems can disrupt a woman's ability to earn her normal social and sexual functioning significantly and thereby transform relatively minor health effects into potential catastrophes.

There were few reports of IUCD insertion events and problems and most of them were related to pain at insertion, however, Rates of overall problems related to the insertion of the IUCD found in the present study (19.9%) was higher than that reported by Bastin *et al.*,[12] and Kokonya *et al.*,[13] in which the insertion-related complaint reported by both was (14% and 16.0% respectively).

On other hand pain (moderate and sever pain) at insertion reported in this study was (14.3). which are so close to the result obtained by Howard *et al.*,[8] which was (14.2) but it's less than the rate of insertion pain reported by Kumar *et al.*,[14] which is equal to (29%).

Events related to IUCD use are associated with 3 types of factors, the IUCD characteristics, the provider characteristics and the acceptor characteristics. The accepter characteristics in This Studies had reported that age, education and parity of women fitted with IUDS had no effects on the events related to the insertion of the IUCD and early after-words. In general the effect of parity is confounded with that of age, appearing that more parous who older, have less adverse events.[15, 16] However, data of our study did not have the sufficient power to detect differences between women with IUCD related problems and those without concerning these factors. These results agree with those found by previous studies[17, 18] who reported that age factor didn't affect the unfavorable outcomes of IUCD insertion but not with results of al. Kavanaugh *et al.*,[19] who reported that sever pain at insertion is associated with higher education and lower parity and that of Jatlaoui[20] and Grunloh *et al.*,[21] who reported that expulsions are more common among young women who have not been pregnant. Also Deans and Grimes[22] had advised against the use of IUDS for young nulligravidae and Wiebe *et al.*,[23] had concluded that insertion of IUCD in nulligravida should be performed only when other methods of contraception are unacceptable.

Nevertheless, the current study demonstrates among IUDs users an increased risk of problems at insertion particularly pain for women had their last delivery by Cesarean section; this finding agree with Trigueiro *et al.*,[24] who had explained the high insertion failure found in their study to the effect of the tight cervical canal of women delivered by Cesarean section and disagree with result of Kultucan *et al.*,[25] who had concluded that IUCD is a satisfactory method of contraception in women have had a previous Cesarean section.

In the present study, data had indicated a significant increase risk of developing problems among IUDs users having the same problem before insertion (especially menstrual problems, infection, LAP, and backache) these results agrees with Mohllajee *et al.*,[26] Eposito study[27] and Sufrin *et al.*,[28] who reported that women with infection fitted with IUDS were more likely to develop complications than women without.

Analysis was done on the available data, and 267 participants in the present study asked about their experience with Copper IUCD insertion. (51.2%) reported adverse events and problems in the order of bleeding and menstrual changes (23.9%), genital tract infection (20.2%), lower abdominal pain (19.4%), and backache (17.9%). These results are higher than that reported by Gupta *et al.*,[29] in which the overall rate of short term complaints (1-4 months post-insertion) was (16%) including heavy bleeding or bleeding for longer than normal, LAP, and backaches. Also higher than the result reported by Kumar *et al.*,[30] in which (22%) of the IUD users reported to have one or more problems related to its use. The major problem was menstrual irregularity (9.8%) followed by backache (6.5%) and other problems (6.4%).

CONCLUSION

The insertion of a device results in 19.9% of events, including pain, bleeding, insertion failure, cervical laceration, syncope, and perforation. the most important Risk factor was previous Cesarean section delivery. Adverse experiences include bleeding, menstrual

changes, genital tract infection, abdominal pain, backache, and pregnancy.

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