Scientific Research Publishing

Open Journal of Obstetrics and Gynecology, 2022, 12, 616-623
https://www.scirp.org/journal/ojog
ISSN Online: 2160-8806
ISSN Print: 2160-8792

Outcome of Pregnancies under Cupper Intrauterine Device: Experience of 10 Cases Collected at the Principal Clinic of the Togolese Association of Family Well-Being Planning Center (ATBEF)

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How to cite this paper: M'bortche, B.K., Logbo-Akey, K.E., Ketevi, T.A., Douaguibe, B., Baramna-Bagou, F., Aboubakari, A.-S. and Akpadza, K. (2022) Outcome of Pregnancies under Cupper Intrauterine Device: Experience of 10 Cases Collected at the Principal Clinic of the Togolese Association of Family Well-Being Planning Center (ATBEF). *Open Journal of Obstetrics and Gynecology*, **12**, 616-623.
https://doi.org/10.4236/ojog.2022.127055

Received: May 31, 2022
Accepted: July 19, 2022
Published: July 22, 2022

Abstract

Aims: Although the copper intrauterine device (Cu-IUD) is an effective contraceptive device, cases of pregnancy under the Cu-IUD have been reported. We here report 10 women who got pregnant under this condition, with special reference to etiologies and pregnancy outcomes. **Methodology:** We analyzed all women who got pregnant under Cu-IUD at ATBEF Main Clinic from July 1, 2015 to June 30, 2020. **Results:** We retrieved 10 patients. The durations of Cu-IUD use were 3 months to 6 years. The etiologies were poor insertion; migration and spontaneous expulsion. The occurrence of pregnancy was poorly accepted by the women: 20% of women considered it was due to the providers' incompetence. Of the 10 pregnancies, 5 women had given vaginal birth spontaneously; 2 induced abortions, 2 spontaneous abortions and 1 ectopic pregnancy. The contraceptive method adopted after pregnancy was jadelle implants in 8 cases and spousal vasectomy in 2 cases. **Conclusion:** The prevention of IUD pregnancies may require adequate insertion time, insertion technique and follow-up.

Keywords

Contraception, Pregnancy, Etiologies, Outcome, Lomé

1. Introduction

The copper intrauterine device (Cu-IUD) is a modern contraceptive method

used by couples to space or limit births. Inserted into the uterine cavity, it works by destroying spermatozoa to prevent them from meeting the oocyte [1]. Pregnancy in a woman wearing an intrauterine device is rare. The failure rate of this contraceptive method, as expressed by the PEARL index, varies between 0.2% and 1.6% depending on the performance of the device, irrespective of the location of the egg implantation [2] [3]. Expulsion of the Cu-IUD, which can go undetected, occurs in about 5% - 10% of women within 5 years of insertion [4] and can then, of course, lead to pregnancy. However, cases of pregnancy have been reported in the literature when the IUD is in place. The occurrence of an unplanned pregnancy creates a psychological disturbance and a problem for pregnancy management for couples.

We report 10 cases of pregnancy in women on the Cu-IUD diagnosed at the ATBEF Main Clinic to:

- determine the main probable etiologies;
- describe the perception of this situation;
- to specify in each case, the outcome of the pregnancy.

2. Methodology

This was a prospective and descriptive study conducted at the ATBEF Main Clinic from 1 July 2015 to 30 June 2020. It concerned all cases of pregnancy diagnosed in women who were on a copper intrauterine device. The Cu-IUD was either inserted at the ATBEF clinic or at another health facility. Pregnancy was diagnosed by ultrasound. The parameters studied were age, parity, time of insertion, duration of use, site of pregnancy, location of the Cu-IUD, term of pregnancy at diagnosis, probable causes of method failure, experience and perception of pregnancy, outcome of pregnancy and subsequent contraception.

3. Results

3.1. Frequency

During the study period, we recorded 10 cases of pregnancy among the 1783 women who were on the Cu-IUD at the centre, *i.e.* a frequency of 0.6%.

3.2. Socio-Demographic Characteristics of Patients

The average age of the patients was 30.1 years, with extremes of 19 and 39 years. Six patients were older than 30 years. The average parity was 3 with extremes of 0 and 6. Half of the patients were multiparous. Seven patients were married and three were single.

3.3. Time from Insertion to Diagnosis of Pregnancy

The Cu-IUD was inserted between day 4 and day 10 of the menstrual cycle in nine patients. In only one case was the Cu-IUD inserted post-placental. The average time from insertion to diagnosis of pregnancy was 25.1 months, with extremes of 3 months and 72 months.

All of the insertions were performed by midwives in different health facilities.

3.4. Status of the Cu-IUD, Site and Term of the Pregnancy

The pregnancy was intrauterine in 9 cases and extrauterine in 1 case. The Cu-IUD was found in the uterus on ultrasound in 8 cases and was not found in two cases. The Cu-IUD was in the cervical-isthmic region in 2 cases, intramyometrical in 2 cases, and in the uterine fundus in 4 cases. The term of the pregnancy at diagnosis varied from 6 weeks of amenorrhoea to 18 weeks of amenorrhoea (Table 1).

3.5. Probable Reasons for Pregnancy on the Cu-IUD

The causes of pregnancy would be poor insertion of the IUDcu in 20% of cases (insertion in the uterine muscle); migration in 20% of cases (IUD at the isthmus); unnoticed expulsion in 20% of cases; an anti-nesting effect by its mechanism of action in 10% of cases and a probable decrease in the effectiveness of the Cu-IUD in 30% of cases.

Table 1. Summary of the different cases.

	Age (years)	Parity	Time of insertion	Duration of use	Seat of pregnancy	LocaTION IUDcu®	Term of pregnancy
Case 1	34	3	5th day of the menstrual cycle	3 years	Intrauterine	Isthmus	6 weeks of amenorrhoea
Case 2	35	5	6th day of the menstrual cycle	2 years	Intrauterine	None IUD	7 weeks of amenorrhoea
Case 3	39	4	7th day of the menstrual cycle	4 years	Intrauterine	Isthmus	7 weeks of amenorrhoea
Case 4	33	6	4th day of the menstrual cycle	6 years	Intrauterine	None IUD	12 weeks of amenorrhoea
Case 5	24	0	10th day of the menstrual cycle	7 months	Extra uterine	Uterine fundus	6 weeks of amenorrhoea
Case 6	21	0	-----	3 months	Intrauterine	Myometrium	12 weeks of amenorrhoea
Case 7	37	6	5th day of the menstrual cycle	1 year	Intrauterine	Uterine fundus	18 weeks of amenorrhoea
Case 8	19	0	6th day of the menstrual cycle	3 month	Intrauterine	Myometrium	13 weeks of amenorrhoea
Case 9	25	2	Post placental	1 year	Intrauterine	Uterine fundus	7 weeks of amenorrhoea
Case 10	34	4	7th day of the menstrual cycle	3 years	Intrauterine	Uterine fundus	8 weeks of amenorrhoea

3.6. Perception of the Occurrence of Pregnancy

The occurrence of pregnancy among the patients was perceived in different ways. Thirty percent blamed the ineffectiveness of the method, 20% thought that the provider was incompetent. In 20% of the cases, the occurrence of a pregnancy under the method was a divine will. In 30% of the cases, the occurrence of the pregnancy under the method was a bad spell.

3.7. Patients' Attitudes to the Announcement of the Pregnancy

The experience of this situation varied from patient to patient. Forty percent of the patients were surprised with tears when the pregnancy was announced. Thirty percent were worried about the unborn baby and 30% were disappointed with contraceptive services.

3.8. Behaviour in the Face of This Association

The Cu-IUD was removed in two patients (Cu-IUD in the cervical-isthmic situation and in the myometrium). Those in the uterine fundus were not removed after unsuccessful attempts to remove them. Prenatal follow-up was scheduled for the patients. A laparotomy salpingectomy was performed in the patient who had an ectopic pregnancy.

3.9. Pregnancy Outcome

The main complications were spontaneous abortion in two patients in whom the Cu-IUD was removed. Two patients delivered prematurely at 32 weeks' and 34 weeks' amenorrhoea. Two patients had resorted to clandestine induced abortion. Three patients had completed their pregnancies and delivered vaginally. Examination of the delivery revealed the Cu-IUD attached to the placental cake in five cases.

3.10. Subsequent Contraception

The contraceptive method adopted after pregnancy was jadelle implants in 8 cases and spousal vasectomy in 2 cases.

4. Discussion

4.1. Frequency

During the study period, the frequency of pregnancy with the Cu-IUD was 0.6%. Expressed by the PEARL index, the failure rate of this contraceptive method varies between 0.2% and 1.6% depending on the performance of the device, without distinction of the place of implantation of the egg [2] [3]. In our study, there were two unnoticed expulsions responsible for the occurrence of pregnancy. Pregnancy was the reason for the unnoticed expulsion of the IUDcu®. To minimize the occurrence of IUD pregnancies, it is imperative before any IUD insertion to ensure that there is no incipient pregnancy, to respect the precautions

for IUD insertion, and to institute periodic monitoring.

4.2. Probable Causes of Method Failure

The mechanism of action of the Cu-IUD is thought to proceed from several phenomena [1] [5]: in the cervical mucus: alteration of the mobility, capacitation and therefore the fertilizing power of the spermatozoa; in the uterine cavity: cytotoxic effect and alteration of spermatozoid transport. The copper surface area required for satisfactory effectiveness must be greater than or equal to 250 mm^2 [6]. For this method to be effective, insertion must be done at any time with reasonable assurance that the woman is not pregnant. The Cu-IUD should be placed deep in the uterine cavity and its vertical stem should not descend into the cervical canal below the isthmus. In our study, the intrauterine device used was the T 380 A copper device with a copper surface area of 380 mm^2. The main reasons for the occurrence of pregnancy would be poor insertion (insertion into the uterine muscle), secondary migration of the IUD into the uterine cavity, unnoticed expulsion, an anti-nesting effect due to its mechanism of action and a probable decrease in the effectiveness of the Cu-IUD. In our study, the Cu-IUD was found in the myometrium in 20% of cases. This complication would result from the provider's failure to master the insertion technique. Inserted in the myometrium, this IUD will not be able to prevent fertilisation and implantation. It is important to master the technique of Cu-IUD insertion and to perform a systematic ultrasound after insertion to ensure the proper placement of the Cu-IUD. Routine ultrasound after IUD insertion is not a recommended practice in the country but is essential if insertion is complicated.

Secondary migration of the Cu-IUD was found to be associated with pregnancy. This is probably due to the amount of menstrual flow. It should be noted that menstrual flow varies from one woman to another and, for the same woman, varies from one moment to another in relation to certain gynaecological pathologies and even in relation to the Cu-IUD since some studies have reported an increase in menstrual flow due to the Cu-IUD [1] [5]. Four to 15% of women are reported to discontinue the Cu-IUD within one year of insertion because of menorrhagia [7]. It is important to institute regular follow-up in women on the Cu-IUD and always check the correct placement of the Cu-IUD to ensure the effectiveness of the method.

Another situation in our study would be related to the anti-nesting effect of the Cu-IUD. It is now clearly demonstrated that Cu-IUD does not increase the risk of ectopic pregnancy. The risk of ectopic pregnancy is even reduced in women with a Cu-IUD (0.25% per year) compared with 0.5% in women without contraception [7] [8]. Nevertheless, when a woman with a Cu-IUD is pregnant, this diagnosis must be eliminated because 1 in 20 pregnancies is extra uterine [9] [10].

We have found cases of pregnancy even though the Cu-IUD is still in the uterus. This situation has led us to think that the effectiveness of the Cu-IUD has

probably decreased.

4.3. Perception of Pregnancy Occurrence

The occurrence of pregnancy among patients was perceived as ineffectiveness of the method, incompetence of the provider, and divine will.

The Cu-IUD is a very effective method when properly inserted, as most studies have pointed out [2] [3]. The failure in our study is partly due to poor insertion, which would be related to provider incompetence. To remedy this situation, it is important to strengthen the skills of midwives in charge of contraceptive services and to check the correct position of the Cu-IUD with pelvic ultrasound. If the Cu-IUD is not correctly inserted, it is important to remove it and repeat the procedure correctly.

4.4. Patients' Attitudes to the Announcement of the Pregnancy

The experience of this situation varied from patient to patient. Forty percent of the patients were surprised with tears when the pregnancy was announced. Thirty percent were worried about the unborn baby and 30% were disappointed with the contraceptive services. The occurrence of pregnancy under intrauterine contraception is rare, being estimated at less than 1% per woman-year, but it is still not a good experience, with various fears such as the risks for the unborn baby, as we found in our study [11] [12]. This is the "real" failure of the method. To improve this experience, it is important to specify the possibility of pregnancy despite the use of a modern contraceptive method, since contraceptive methods are not 100% effective. If the woman is aware of this, she will be able to accept the occurrence of pregnancy better, even if her objective was to avoid a pregnancy temporarily or permanently.

4.5. Pregnancy Outcome

The main complications were spontaneous abortion in two patients in whom the Cu-IUD was removed. Two patients delivered prematurely at 32 and 34 weeks' gestation. Two patients had resorted to clandestine induced abortion. Three patients had completed their pregnancies and delivered vaginally. Examination of the delivery revealed the Cu-IUD attached to the placental cake.

Our results corroborate those in the literature. Indeed, the finding of a pregnancy invites the removal of the Cu-IUD if the threads are still accessible [1] [5]. The theoretical risk of the presence of a foreign body is represented by late septic abortion, which would occur a little more than one in two times [9]. However, no risk of congenital malformations or genetic abnormalities [7] has been demonstrated. Nevertheless, the risk of early spontaneous miscarriage after removal of the Cu-IUD is estimated at about 30% [13].

In fact, a pregnancy occurring under the Cu-IUD whether the Cu-IUD has been removed or not, is at risk of premature delivery, premature rupture of the membranes and chorioamniotitis, this risk appearing to be increased when the

Cu-IUD is left in place [2].

5. Conclusion

Pregnancy on the Cu-IUD is a reality. The prevention of pregnancies under the Cu-IUD will require scrupulous respect for the time of insertion, the insertion technique and follow-up. To improve the experience of this situation, it is important to discuss cases of contraceptive failure during counseling sessions before the initiation of a contraceptive method.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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