Clinical Obstetrics, Gynecology and Reproductive Medicine

Research Article

The intra-uterine device (IUD) of the immediate postpartum a comparative study between the caesarean IUD and the IUD inserted after a natural delivery

Ousmane Thiam[1*], Mamadou Lamine Cissé[2], Papa Ndiaye[3], Mariétou Thiam[2], Jacque Noel Tendeng[3], Mamour Gueye[4], Mouhamad Oumansour Niang[4], Abdou Aziz Diouf[1] and Jean Charles Moreau[4]

[1]Regional Hospital of Ndioum, Senegal

[2]Unite and Training in Health and Sport Research, Thies, Senegal

[3]Unite and Training in Health and Sport Research, Gasbon Berger, Saint Louis, Senegal

[4]University Hospital of Aristide Le Dantec, Dakar, Senegal

Abstract

This study aims to determine the epidemiological profile of patients who have been placed IUDs per caesarean section after vaginal delivery and assess the complications of the IUD put in after caesarean section and vaginal delivery. This was a prospective randomized study of cases of IUD placed during caesarean section and after vaginal birth in the service of Obstetrics and Gynecology, at the *Centre Hospitalier de Ndioum*. The study was conducted from January 1 to December 31, 2013. We included all patients who met the WHO IUD eligibility criteria. The variables studied were the socio-demographic characteristics, pregnancy and delivery peculiarities, the inserting and monitoring methods of the IUD. We used the 3.5.3version of software EPI6 info and software R3.0.2 for data analysis. Inserting an IUD Tcu 380 A was performed in103 women among whom 52 during caesarean section (50.5%) and 51 in the immediate postpartum see low (49.5%). 4 cases of expulsion was noted, 3.9% of cases. Pain after IUD insertion in per-Caesarean section was found in 11.8% against 25% in postpartum M1; M3 was 32% against 46.6% and M62% against 0%. IUD insertion per-cesarean has an acceptable expulsion and no increased risk of adverse events rates. This technique should be popularized.

Introduction

Etymologically, the word contraception derives from two Latin terms: « Contra » which means « against » and « concipere » which means « to conceive ». Contraception refers to all the methods that aim at avoiding impregnation on a temporary and reversible basis, contrary to sterilization, which is permanent and irreversible [1,2]. The expansion of science has allowed a widespread use of the practice of contraception. Its accessibility has been favored by a wide range of safe and adapted methods and products, among which the IUD. It is a safe reversible and very effective method, but a lot of obstacles discourage its use. In fact, compromising rumor has been spread about this method, and it has been given the pejorative name of « coil ». Thus, people's lack of information and education constitutes the main barrier to the expansion of the IUD [3]. In 2011, only 44.9% of Senegalese women knew about the IUD versus respectively 78.9%, 75.2% and 57.2% for the pill, the injectable, and the implants [4]. In order to improve the acceptability of the IUD method, it is important to inform and educate people.

Among the majority of women, the will to practice contraception appears just after childbirth. That period seems to be the most appropriate time to sensitize women, and even to propose contraception to them, especially in developing countries where the gravido-puerperality generally constitutes the only contact period between the woman and reproduction health services. Unfortunately, the prevailing idea was that the IUD was contra-indicated for the postpartum. This belief disqualifies the choice of the IUD method of contraception and leads to a rate of use largely below expectations.

However, recent studies carried out in China and India have shown that the IUD could be used for the postpartum and the immediate post abortion without the fear of a possible raise of the complication risks such as its expulsion from the uterus or the perforation of the latter [5].

The general objective of this study, which was carried out at the Ndioum hospital, was to evaluate the feasibility and innocuousness of the postpartum IUD inserted via per-caesarean.

Its specific objectives are listed below:

- To determine the epidemiological profile of the per-caesarean IUD patients.
- To determine the profile of the patients whose IUD was inserted after a natural childbirth.
- To evaluate the complications of the IUD inserted during a caesarean.
- To evaluate the complications of the IUD inserted after a natural childbirth.

Correspondence to: Ousmane Thiam, Regional hospital of Ndioum, Senegal, Tel: 00 (221) 77 5085071; **E-mail:** cassoumane@yahoo.fr

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Methodology

Type of study

This is an experimental study about the IUD cases fitted in during caesarean and after natural delivery at the gynecology and obstetrics service of the Ndioum hospital. The study was carried out from January 1st, to December 31st, 2013, that is, for twelve (12) months. This allowed us to form two groups.

Inclusion criteria

All the patients matching the World Health Organization (WHO) IUD eligibility criteria were included in the study. For the caesarean cases, the patient's approval had been sought for a free enlightened and signed consent.

Non-inclusion criteria

We did not include the following cases in the study:

The patients who did not match the WHO IUD eligibility criteria.

A systematic refusal of the patient.

Any case of uterine malformation diagnosed during the caesarean.

Any case of hemorrhagic pathologies in the third term (quarter).

Data collection and analysis

A data collection sheet including all the variables has been devised. For each quantitative variable, the average has been calculated surrounded by its standard deviation. For the qualitative variables, we have calculated the percentages and the IC to 95%. The STUDENT test has been used for the comparison of averages. For the percentages, the CHI2 test has been used. The limit has been fixed to 0.05. For any significant case, the relative risk is calculated and its IC to 95%. The data collection was performed thanks to the 97-2003 Excel application program. The EPI 6 Info application program version 3.5.3 and the R application program version 3.0.2 were used for data analysis.

Results

Descriptive results

Frequency: During the period of study, the insertion of an IUD T CU 380 A was performed in 103 women, 52 of them during the caesarean, that is 49.5% of the IUD T CU 380 A; the other 51 women, in immediate postpartum, that is, 50.5% of the IUD T CU 380 A.

Socio-demographic features

Age of the patients: The average age of the patients was 29.9612 ± 8.6045 with the extremes of 15 and 46 years old. The most represented age group was aged 35 to 40 years old (25.20%). One patient out of four was 22 years old. Those who were 37 years old represented 75% of the patients.

Gestation: The average gestation was 5.6 ± 3.6 with extremes of 1 and 15. The primigravidae were the majority (32%). The multi gravidae and big multi gravidae represented respectively 30% and 29% of the population.

Parity: The average parity was 4.5 ± 3.2 with extremes of 0 and 11. The multiparous were the most represented (29.1%), followed by the big multipara (28.3%). The primiparous constituted 24.3% of the population; the paucipara represented 11.6% and the multiparous, 6.8%.

Occupation (job): The majority of the patients were unemployed (89.3%); 8.7% of the patients were students and 1.7% of them were farmers.

Academic level (Level of Education): The majority of the patients did not attend school (80.6%). Those who attended primary school represented 14.6%. Only 4.9% of the patients attended secondary school.

The Notion of anterior contraception: The majority of the patients had never used contraceptive methods before (94.2%). Oral contraception and the injectables were the most used methods, with the same use rate, that is 1.9%. Only 1% of the women were using implants or the IUD.

Number of living children: The average number of living children per woman was 3.7 ± 3 with extremes of 0 and 11. One patient out four was childless; 75% of the patients had less than six children.

Clinical aspects

Body mass index: The average Body Mass Index (BMI) was 23.05 ± 3.74 kg/m² with extremes of 15.11 and 37.5 kg/m². Nearly three patients out of four had a BMI inferior to 25.2 kg/m². The thin patients represented 4.9% of the total cases.

Current pregnancy

Types of pregnancies: In the majority of cases, the pregnancy was of singleton birth type (87.5%). Twin pregnancies represented only 12.5% of all the pregnancy cases. 85.4% of the patients had full-term pregnancies. Premature births represented 2.9% of the cases while 1.90% of the pregnancy cases went beyond full-term.

Number of antenatal consultations (ANC)

The average number of ANC was 2.5 ± 1.47, with extremes of 0 and 5 consultations. Almost one patient out of three (31.1%) had four ANC or more. The ANC was of good quality for 53%, medium quality for 20.5%, and of low quality for 26.5% of the cases.

IUD Insertion

Technique: The instrumental insertion technique was the most used (73.8%). The manual insertion technique represented 26.2% of the total number of insertions.

Scan before getting out of the maternity hospital: All the patients had undergone a scan that confirmed the presence of the IUD in their uterine cavity. The average distance between the fundus and the horizontal branch of the IUD was 17.8 ± 10.3 mm with extremes of 6 mm and 63 mm. The distance was less than 10 mm for one patient out of four. For 75% of the patients, the distance was inferior to 23 mm. The most representative distance range was that of 6-16 mm, that is, 49.5%.

At the end of the scan control, all the patients decide to carry on with the IUD contraception.

Follow – up of the patients

All the patients were examined during the first month of the follow-up period. The IUD was well placed among 99 patients, that is, 95.1% of the total. There were four cases of expulsion, which represents 3.9%.

The distance between the Fundus and the horizontal branch was 63, 57, 40 and 39 mm for four patients who had an IUD expulsion.

The vaginal smear was performed on all patients who had leucorrhoea; we noticed the following data:

In the first month

- 5 cases of candida albicans
- 2 cases of Trichomonas vaginitis
- 11 cases with a negative smear

In the third month, there was a negative smear.

In the sixth month:

- 3 cases of vaginal candida
- 10 cases with negative results

Analytical Results

Follow-up of the first month: The distance between the horizontal branch and the fundus was on average 14.4 mm versus 21.3 mm among the patients who gave birth via natural delivery. The difference was statistically significant (p=0.0007).

The proportion of the patients who felt a pain in the first month was 11.8% for the per-surgery IUD versus 25% for the immediate postpartum IUD. The difference was not statistically significant (p=0.06).

Follow up of the 3rdmonth: The proportion of the patients who felt a pain in the third month was 32% for the per-surgery IUD versus 46.6% for the immediate postpartum IUD. The difference was not statistically significant (p=0.09).

The proportion of the patients who had leucorrhea in the third month was 0% for the per-surgery IUD Versus 6.1% for the immediate postpartum IUD. The difference was not statistically significant (p=0.05).

Follow up of the 6th month: The proportion of the patients who felt a pain in the sixth month was 2% for the per-surgery IUD versus 0% for the immediate postpartum IUD. This difference was not statistically significant (p=0.05).

The proportion of the patients who had leucorrhea in the sixth month was 24% for the per-surgery IUD versus 2% for the postpartum IUD. The difference was not statistically significant (p=0.001). The postpartum inserted IUD was a protecting factor (RP/0.06 IC at 95% [0.008-0.5]).

Discussion

Frequency

During the period of study, we performed 1554 deliveries, out of which 268 caesareans, that is to say, a rate of 17.2%. The insertion of a Tcu 380A IUD was performed on 103 patients that is 6.6% of the patients. The Tcu 380A IUD was used on 51 caesarean cases that is 19%. The participation rate seems to be low compared to the data of the literature. The study of Xu *et al.* [6] was carried out on 878 patients recruited in thirteen centers of Shanghai for a period of one year [6] and the one of Morrison *et al.* [7], 224 and 110 patients recruited in 1992, respectively in Kenya and in Mali.

However, this rate is acceptable given that it was about a preliminary study, one of the first studies on the subject matter carried out in Senegal. The studies carried out on the postpartum IUD generally concerned the two ways of insertion (high and low), and some them were done by international organizations such as FHI and were funded by sponsors [8]. These are so many factors facilitating recruitment.

The profile of the patients

The age of the patients: The average age of the patients (24.7 ± 7 years for the per-caesarean IUD and 35 ± 6 years the postpartum IUD) was close to those found in the literature. It varied from 15 to 46 years old. In Morison *et al.* [7] study (2007), the average age in Kenya was 23 years old and 31 years old in Mali.

Socio – economic level: The marital status of our patients differ from the one found in the literature. In Kenya, the rate of married patients was 66.5% in Morisson *et al.* [7]. E. Levi (2012) only reported 38% of married patients in his study [9].

The data from Mali are close to ours with a rate of 98.10% of married patients. The social realities of our different countries could account for these differences [7].

The profile of our patients was that of an unemployed, illiterate and low in-come married woman.

Gyneco-obstetric medical history: Contrary to the majority of the studies, most of the patients in this study were multi gravidae and big multi gravidae with respectively 29% and 28.3% [6]. Contrary to Xu *et al.* [6] series where most of the patients were gravidae I (97.7%) [6].

In Africa, a lot of cultural barriers dissuade women from doing contraception. Thus, the idea of an especially long-term contraception for a multi gravidae is negatively perceived in our societies, hence the rate of 24.3% of the cases. The results of Xu *et al.* [6] study could be justified by the one child policy in China, where the postpartum IUD constitutes the ideal solution to the implementation of the law. Most of our patients had never tried contraception before (94.2%); and among those who already did, only 1% of them resorted to the IUD. However, in Morisson *et al.* [7] series (9.4% in Kenya and 3.6% in Mali), some patients already used the IUD before. The rate was 26% in Celen *et al.* [5] study. This difference impacted the participation rate of the work on IUD use. The acceptance of a contraceptive method is less obvious for the first experiment, especially when it is about IUD because of enormous contraception options available to the population.

Insertion

All our patients were treated at the Ndioum hospital during their pregnancies, and most of them carried single babies (87.5%). A counseling on contraception via per-partum IUD or immediate postpartum IUD was offered. The interviews were run during the last three months for the patients who were treated in the service so as to facilitate the recruitment as in E. Levi's series [9] and in Nelson *et al.* [10]. The prenatal counseling allowed us to ensure the eligibility and free decision-making of the patients, without any influence. Immediately after the artificial delivery and the uterine check (examination of the uterus) - e.g, within the ten minutes following the delivery via caesarean, or two days after a natural delivery -, a Tcu 380A IUD was inserted by a qualified doctor. The providers in E.Levis [9] series all received training from one of the investigating doctors. The instrumental method was the most used method (73.8% versus 26.2% for the manual method). Levis *et al.* [12] made use of the manual method [9] while Celen *et al.* [5] used the instrumental one.

The insertion of the IUD per-caesarean in Nelson *et al.* [10] series was performed by using a tube of IUD that was removed afterwards

during the vaginal wash. The objective was to extract the threads of the IUD from the insertion.

As in all the studies found in the literature, an examination check was performed before the release of the patients [5,9].

Respecting the follow-ups

In our study, we did not notice any patient loss. After six months of follow-up, all the patients kept to their appointments. This rate differs from the one mentioned in the literature. In Iverson *et al.* [11] series, 25% of the patients did not respect their medical follow–up after the insertion of the IUD per-caesarean; 50% of the patients of E. Levi's cohort went back to the six weeks follow-up [12]. However, the results of Xu *et al.* [6]'s study in China ended up with a rate of 92.5% of the patients followed until the sixth month [6]. This is close to our data (100%). E. Levi reported a rate of 60% of the patients who did their follow-ups regularly or gave follow-up information via telephone [9].

Side effects

Pains: The uterine cramps are rather frequent complaints for the patients using the IUD. They constitute the second motive of abandonment of the method. At the first medical examination (M1), 11.8% of the women who benefited from the insertion per-caesarean complained of pain as opposed to 25% for the immediate postpartum insertion. The rate had considerably increased during the second medical check (M3) with 32% and 46.6% for respectively the per-caesarean and the immediate postpartum cases. However, the rate considerably decreased during the third medical check (M6).

Generally, they are dysmenorrhea connected with an increase of inflammatory prostaglandins under the influence of the IUD. In our research, the encountered pains were dysmenorrhea requiring a non–steroidal anti–inflammatory treatment for the patients who complained about it. The improvement under treatment was noticeable. The pains did not recur, and there was no expressed desire of withdrawal in our series contrary to D. Hubacher and Stanback's series where no noticed 6% of abandonment of the IUD [13].

Leucorrhea: In our study, leucorrheas were noticed on some patients. 18.4% of the total population that was examined presented some vaginal discharge. This rate decrease to 3% at M3 and it reached 13.1% at the third medical check. However, there was a difference between the per-caesarean IUD and the postpartum IUD at the first medical check (M1) with respectively 11.8% versus 25%, at the second medical check (M3) with respectively 0% versus 6.1%, and at the third medical check (M6) with respectively 24% versus 2%.

The examination of speculum that was conducted on every follow-up examination allowed us to depict those leucorrheas. For the majority of the patients who had leucorrheas, these vaginal discharges were not a source of complaint. First, a vaginal swab was made with a diagnostic aim; this allowed the identification of eight (8) cases of infectious leucorrheas (Candida, Albican, and trichomonas vaginitis) and the rest was of physiological nature. A metronidazole, local antifungal, and even sometimes antiseptic-based treatment were administered on them. However neither the IUD nor the time of its insertion could be blamed for being at their origin. Stanback and Shelton reported that the risk of MIP imputable to IUD was extremely weak and would be only 0,15% [14]. This confirms our analysis. The infectious leucorrheas were probably due to a defective hygiene.

Perforation or anchoring

This is a rare complication, which can occur during the insertion of the IUD. During our study, no case of this fearful accident was reported. The insertion of an IUD in the postpartum traditionally blamed for causing uterine perforation [15]. Our results are against this assertion which is currently rejected by the FHI [15]. However, they are in line with the results of K. Eroglu's series [16]. Some studies had reported that the postpartum did not increase the risk of uterine perforation by the IUD [17].

Pregnancy

No case of pregnancy occurred in our cohort for the six month follow-up. The occurrence of this complication is inferior to 1% for one-year use. A study carried out in China came up with a rate of 5.4% of pregnancies after a two-year follow-up of an IUD inserted within the post-placenta period. In another Chinese study, no pregnancy was diagnosed for the six-month follow-up of the immediate postpartum IUD [16]. K. Eroglu reported an occurrence of 1.6% at six months from the insertion of a post-placenta IUD [16]. The comparison of these data to ours suggests that the IUD inserting period is not linked to the occurrence or not of a pregnancy upon IUD. In the light of our results, one can say that the per-caesarean and the immediate postpartum IUD is a very effective method.

Expulsion

It is an equally rare complication with a frequency ranging from 2 to 8% during the first year of use [18]. There were four expulsions out of 103 patients at the end of the three follow-up examinations. Expulsion occurred in the first month of the postpartum that is a rate of 3.8% of the global population at M1. The proportion of the patients who expelled the IUD was 2% for the patients who underwent surgery versus 3.5% for the patients who delivered naturally. Generally, the expulsion happened in the course of the first term following its insertion [10]. This corroborates our results. Many factors provoke the expulsion of the IUD especially the insertion in the postpartum.

The risk of expulsion would be higher in that period [16]. Many works have been carried out allowed to notice that the frequency of the expulsion considerably varied from one country to another, from one study to another. A study carried out in Turkey showed an expulsion rate of 12.3% of the IUD inserted in the post-placenta period [5,16]. In E. Levi *et al.* [9] series, no expulsion was found up to the sixth month of the postpartum. Many reasons would account for these discrepancies. The postpartum constitutes a risk factor for the expulsion of the IUD; however, this risk depends on the insertion period, on the manner and the technique of insertion. The post-caesarean insertion seems to be less liable to cause an expulsion than the postpartum natural delivery. Nonetheless, the risk remains higher than in the interval insertion [17]. The occurrence of expulsion in our series (3,8%) was lower than the usual rates, which vary from 9.5 to 12.5% [19]. The insertion manner could account for this low rate. The insertion of the IUD per-caesarean seems to be less prejudicial than the vaginal route. In fact, in our study the proportion of the patients who expelled the IUD was 2% for the patients who underwent surgery versus 3.5% for the patients who had a natural delivery. Kapp *et al.* [17] reported an expulsion rate of 77.8% of the IUD inserted via vaginal route versus 0% for the per-caesarean IUD[17]. A. Cochrane's (year) analysis concluded that the IUD expulsion frequency was significantly higher during the insertion by vaginal route than by caesarean [5,10]. In addition to these incited factors of risk, the parity appears as an element of prognosis.

A control exam must be fulfilled before freeing the patient in order to anticipate any expulsion. The scan measure of the distance between the uterine fundus and the IUD horizontal branch constitutes the most important aspect. We had found an average distance of 17.8 ± 10.4 mm with lengths of 6 mm and 63 mm for the whole population. Nonetheless there were 14.4 ± 10.4 mm for the patients who underwent surgery and 21.3 ± 9.2 mm in immediate postpartum.

These results are in line with those of Xu *et al.* [6] who reported some values varying between 1.6 and 9.9 cm [6]. For the same series, the expulsions surpassed an average distance between the uterine fundus and the horizontal branch of 4.3 ± 1.9 cm, there were 6.6 cm in our series. No expulsion was reported for a distance of 3.8 ± 1.5 cm [6]. If we trust these data, the expulsion risk throughout our study should be superior to 5%. Therefore, the expulsion risk could be over-estimated by the scan. From all these remarks, one can say that the insertion in per-caesarean of the IUD constitutes a best opportunity of the IUD insertion in postpartum in order to minimize the risk of expulsion.

The IUD thread

The main objective of the contraception follow-up by IUD was to make sure of the presence of the IUD in the womb. To that effect, an examination at speculum was performed at every visit of follow-up in order to check the presence of threads, to detect any anomaly of length leading us to suspect a complication and to facilitate the withdrawal. It allows us to confirm clinically the IUD intra-uterine position. After the insertion in per-caesarean, the IUD threads are carried by the flow of lochia or confinements to be then exteriorized in the vagina. During our different visits, the threads were visualized for all the patients. Our results are alike to the ones in the literature. Levi *et al.* [12] reported that the verification was clinically done at the first visit among 74% of the cases. In the Nelson's series, all the IUD threads were in intra-vaginal at the first visit [10].

Table 1. Distribution according to the number of ANC of the patients who had an IUD in immediate postpartum at Ndioum maternity home (N=103).

ANC Number	Number (%)
0	21 (20. 4%)
< 4	50 (48. 5%)
≥ 4	32 (31. 1%)
Total	103 (100)

Table 2. Distribution of patients according to a complication after IUD insertion in the maternity of Ndioum.

Follow up	1st month	3rd month	6th month
Pain			
Yes	18	60	1
No	85	39	98
Leucorrhoeas			
Yes	18	3	13
No	85	97	86
Retour de couches			
Yes		13	57
No		63	42

Table 3. Distribution of patients first month as the occurrence of complications and depending on the type of insertion of the IUD in the maternity of Ndioum.

Variables	Ceasarean (N=51)	Natural delivery (N=52)	p
Distance between the horizontal branch and the fundis	14.4 ± 10.4 mm	21.3 ± 9.2 mm	0.0007
Expulsion			0.188
Yes	1	3	
No	50	49	
Pain			0.07
Yes	6	13	
No	45	39	
Leucorrheas			0.06
Yes	6	13	
No	45	39	

Table 4. Distribution of patients in the 3rd month of onset of pain and leucorrhea depending on the type of insertion in the maternity of Ndioum.

Variables	Ceasarean (N=50)	Natural delivery (N=49)	p
Pain			0.09
Yes	16	23	
No	34	26	
Leucorrheas			0.05
Yes	0	3	
No	50	46	

Table 5. Distribution of patients by 6 months of onset of pain and leucorrhea on the type of insertion in the maternity of Ndioum.

Variables	Ceasarean (N=50)	Natural delivery (N=49)	p
Pain			0.05
Yes	1	49	
No	0	49	
Leucorrheas			0.001
Yes	12	1	
No	38	48	

Return of menstruation

The return of menstruation was noticed among 55.6% of the cases. No disturbance of the menstrual cycle was objectivized. The flow was normal for the sum of the 57 cases. 42.4% of ours ample, the patients presented an amenorrhea. No study finds a relation between copper IUD and amenorrhea. The latter may be noticed in case of contraception by hormonal IUD. In our series, we had used the copper IUD Tcu 380A. Therefore, the amenorrhea noticed during our study would be probably an amenorrhea of nurse.

Conclusion

Throughout this study, we have found that the insertion of IUD per-caesarean had an acceptable expulsion rate and there was no increase in the side effects rate compared to the IUD in natural postpartum. Therefore one can deduce that the per-caesarean IUD is as effective as the IUD immediate postpartum. Therefore, the following recommendations can be made.

-To train an important number of practitioners on the use of IUD in the course of a caesarean.

-To follow-up the evaluation of the per-caesarean inserted IUD in all the obstetrics centers in Senegal in general and the region of Saint-Louis in particular.

-To allow its integration in the medical centers that perform an important number of caesareans in order to cover the contraception needs of their patients.

Conflict of interest

There is no conflict of interest

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