



# Research Journal of Obstetrics & Gynecology

ISSN 1994-7925

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## Research Article

# Effect of Fixation Suture of the Intrauterine Contraceptive Device at Cesarean Section on the Continuity of Trans-Cesarean Post-Partum Contraception

Ariadi and Ade Aulia

Department of Obstetrics and Gynecology, Faculty of Medicine, Andalas University, Dr. M. Djamil Padang General Hospital, 25127 Padang, Indonesia

## Abstract

**Background and Objective:** The intrauterine device (IUD) is one of the safe and effective methods for long-term temporary contraceptive. Unfortunately, IUD also has a risk of expulsion. This study aims to observe the expulsion rate of intrauterine contraceptive device (IUD) which was inserted with sutured and non-sutured models on trans-cesarean section procedure and their effects on the continuity of trans-cesarean post-partum contraception. **Methodology:** This is an experimental study with the method of post-test control group design to determine the differences of expulsion rate between sutured and non-sutured models of trans-cesarean IUD insertion conducted at Dr. M. Djamil General Hospital in Padang, Dr. Reksodiwiryo Military Hospital in Padang and Painan District Hospital. The results of this study were analyzed using the Fisher's exact test in the SPSS program version 15 (IBM Inc.) and the p-value <0.05 considered as statistically significant. **Results:** In this study, authors obtained 88 samples, 44 patients used the sutured IUD and 44 patients used the non-sutured IUD model through trans-cesarean methods. The percentage of expulsion in the non-sutured group was 11.4%. There were no significant differences between sutured and non-sutured models of trans-cesarean IUD insertion. **Conclusion:** The rate of IUD expulsion was higher when it is not sutured compared to the sutured model. Statistically, there were no significant differences.

**Key words:** Sutured IUD, expulsion, trans-cesarean method, post-placental insertion, long-term contraceptive

**Citation:** Ariadi and Ade Aulia, 2017. Effect of fixation suture of the intrauterine contraceptive device at cesarean section on the continuity of trans-cesarean post-partum contraception. Res. J. Obstet. Gynecol., 10: 17-21.

**Corresponding Author:** Ariadi, Department of Obstetrics and Gynecology, Faculty of Medicine, Andalas University, Jl. Perintis Kemerdekaan, 25127 Padang, Indonesia Tel: (+62) 751 39246, (+62) 811662934

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**Competing Interest:** The authors have declared that no competing interest exists.

**Data Availability:** All relevant data are within the paper and its supporting information files.

## INTRODUCTION

Reproductive health as a program in the population and family planning affairs are the activities to improve the reproductive health quality. The aim of these activities are to increase mother, infant and child survival rates, prevent sexually transmitted disease (STD), including HIV and AIDS, prevent reproductive organ cancer and overcome secondary infertility<sup>1</sup>.

The current state of reproductive health in Indonesia is worrying due to mothers, infants and children survival rate are still low, which could be seen from the high number of maternal mortality rate (MMR) and infant mortality rate (IMR). The Indonesian health demographic survey data of 2007 showed the number of MMR was 228/100.000 live births, IMR was 34/1000 live births and the estimated number of deliveries were about 4.5-5 million/year<sup>1,2</sup>. While according to the Indonesian health demographic survey data of 2012, the number of MMR was 359/100.000 live births and IMR was 32/1000 live births<sup>1,2</sup>.

The insertion of intrauterine device (IUD) immediately after delivery had already been recommended by the WHO as one of the safe and effective methods for long-term temporary contraceptive. In the after-delivery period, mothers usually are very motivated, thus they need an effective method of contraception so that their children could grow without having to worry about unwanted pregnancies<sup>3</sup>.

Dilemmas can occur in certain conditions, for example, if the mother was asked to wait for 6 weeks before initiating an effective contraceptive method, there's a possibility where pregnancy may occur unintentionally. Even worse, the patient may not return for the insertion of contraceptives. This approach is more applicable in Indonesia where delivery might be the only time when a healthy mother come in contact with the health workers. Compared with sterilization, the use of intrauterine device (IUD) is simpler and cheaper. Furthermore, it doesn't disrupt the breast milk production and could be reversible. The insertion of IUD after delivery can avoid discomfort that typically occurs during the interval insertion and any bleeding from insertion can be disguised by the lochia. However, post-partum IUD insertion also has disadvantages. The risk of spontaneous expulsion is very high<sup>3</sup>.

Kittur and Kabadi<sup>4</sup> in Egypt reported that after a counsel for post-partum family planning patients who approved for the insertion of post-placenta contraceptive, 71.2% agreed to become acceptors and among those who approved the insertion of interval method contraceptive there were only 7.2% returned for the insertion<sup>4</sup>. Similar cases happen in Columbia and Turkey<sup>4</sup>, whereas the installation of

contraception during cesarean section had lower expulsion number than vaginal installation and without any occurrence of post-operative complications. It can be inferred that the insertion of post-operative intrauterine device is still effective and beneficial<sup>4</sup>.

In the early studies, most of the post-partum insertions done in several countries were performed after several hours up to 7 days or more after birth. Since the 1970s, the immediate post-placenta insertion was performed, where the insertion of IUD that was done in 10 min after delivery of the placenta had been recommended<sup>5</sup>. Some of the reports showed lower expulsion rates in this case but some other reports showed high numbers of expulsion<sup>5</sup>.

The expulsion numbers of immediate post-partum insertion of IUD is higher than interval insertion which may even reach 24%<sup>6</sup>. Expulsion numbers in the manual and forceps ring procedure are almost the same, but there are differences in the expulsion numbers of experienced and inexperienced operator. The immediate insertion after childbirth during cesarean section is related to the lower number of expulsion rate compared to the insertion after vaginal delivery. The advantages of immediate insertion were considered more than the expulsion risk. The disadvantage of waiting for 4-6 weeks after childbirth for interval insertion is that the patient mightn't return for the insertion of IUD<sup>6</sup>.

Expulsion rates varied based on the time of insertion<sup>7</sup>:

**Post-placenta:** 13-16%, but can be lowered to 9-12.5% depends on the experience of the operator

**Trans-cesarean:** 4-13%

**Immediate insertion after post-partum:** 28-37%

**Late insertion after 48 h:** Four weeks since delivery is not recommended

Various attempts were made to reduce the number of IUD expulsion, especially on the post-placental and trans-cesarean insertion. Through a clinical randomized trial study, Thiery *et al.*<sup>8</sup> concluded that the Delta Loop IUD was not proven to have high number of expulsion rate. Type-T IUD (Delta TCu 220C and TCu220C) had lower expulsion rate. Lower expulsion rate also occurs in tied or untied TCu 220C<sup>8</sup>. Delta loop IUD, delta TCu 220C and TCu 220 were safe for post-partum insertion in terms of infection or perforation<sup>8</sup>. This study aimed to enhance the knowledge about the rate of IUD expulsion and to find a better model to lower the expulsion rate.

Based on the description above, authors were interested to do research on the effect of sutured and non-sutured

intrauterine device models insertions during cesarean section to the expulsion numbers at several West Sumatera Hospitals which are Dr. M. Djamil General Hospital, Dr. Reksodiwiry Military Hospital and Painan District Hospital.

## MATERIALS AND METHODS

This research was an experimental study with the post-test control group design method to determine the differences in the amount of IUD expulsion between sutured and non-sutured models that were inserted during cesarean section in Dr. M. Djamil General Hospital, Dr. Reksodiwiry Military Hospital and Painan District Hospital.

The subjects in accordance with the inclusion and exclusion criteria underwent IUD insertion with trans-cesarean method after explanation and informed consent were done. During the study period from April-July, 2014, authors obtained 88 patients who used IUD with trans-cesarean methods that qualified the inclusion and exclusion criteria from Dr. M. Djamil General Hospital, Dr. Reksodiwiry Military Hospital and Painan District Hospital. The participants were divided into two groups, a group of 44 patients used the sutured IUD model through trans-cesarean methods and the other group of 44 patients used the non-sutured IUD model through trans-cesarean method.

Then, 3 months after the procedure, an ultrasonography examination was performed to view the IUD position.

This study can complete the previous study about the efforts to reduce the IUD expulsion rate, especially with trans-cesarean method.

**Statistical analysis:** This study was analyzed by using Fisher's exact test in the SPSS program (version 15, IBM Inc.) and the p-value <0.05 considered as statistically significant.

## RESULTS

In this study, authors obtained 88 samples from Dr. M. Djamil General Hospital, Dr. Reksodiwiry Military Hospital and Painan District Hospital, who qualified the inclusion and exclusion criteria. The patients agreed and gave their consent to the insertion of intrauterine device after explanation. From these samples, authors differ the characteristics of study samples based on age, parity and cervical dilatation as shown in Table 1.

The average maternal age in the sutured group was slightly higher than the non-sutured group. The difference was not statistically significant, because the p-value >0.05, thus both groups in terms of age could be considered equivalent.

Table 1: Characteristics of research sample

Variables	Group		p-value
	Sutured	Non-sutured	
Age (years old)	Mean ± SD 27.95 ± 5.05	Mean ± SD 27.75 ± 5.22	0.70
Parity (amount)	1.95 ± 0.78	1.72 ± 0.79	0.18
Dilatation (cm)	1.50 ± 2.36	1.57 ± 2.35	0.90

Table 2: Treatment effects of IUD fastening towards the occurrence of expulsion as an outcome

Treatments	Outcome						p-value
	No expulsion		Expulsion		Total		
	Number	%	Number	%	Number	%	
Sutured	44	100	0	0.0	44	100	0.055
Non-sutured	39	88.6	5	11.4	44	100	
Total	83	94.3	5	5.7	88	100	

The average of parity in sutured group was slightly higher compared with those non-sutured group. After statistical tests, the difference was also not significant. Therefore, both groups considered equivalent in terms of parity.

The average of cervical dilatation in the sutured group was slightly smaller than the non-sutured group. The number of difference was also not significant after being tested statistically, therefore both groups could be considered equivalent in terms of cervix dilatation.

The percentage of expulsion in the non-sutured group was 11.4% (as shown in Table 2). The difference was found statistically not significant because the p-value >0.05 which was tested with Fisher's exact test since there were two cells (50.0%) that had a value of less than five.

## DISCUSSION

In this study, authors obtained 88 samples who qualified the inclusion and exclusion criteria. The number of patients that used the sutured model intrauterine device is 44 patients and the rest of them used the non-sutured model.

The fastening thread of the IUD was expected to hold the IUD during involution process of uterine thus reduces the number of expulsions. This study used 2.0 catgut chromic threads with the consideration that chromic threads has 10-14 days maximum power and will be entirely absorbed on the 120th day, which also considered as the time when uterine involution process is complete.

Sample characteristics which is the age, parity and cervical dilatation of the patient when hospitalized, were assessed to measure the quality of the sample. After a statistical assessment, the author obtained p-value >0.05 in all

characteristics. It means that both sample groups were not significantly different in any characteristics and could be considered equivalent.

In this study, the expulsion rate was 11.4% in the non-sutured IUD group and 0% from the sutured IUD group. Then both groups of samples, sutured and non-sutured were tested statistically to its effect to their outcome (expulsed or not expulsed) by using Fisher's exact test. From the test was concluded that  $p > 0.05$ , which means the effects of suturing or not suturing the IUD to the expulsion outcome is not statistically different. Previous studies reported various numbers of expulsion rate in patients who used IUD with trans-cesarean method without additional thread modification. Shukla *et al.*<sup>9</sup> found that the expulsion rate for the immediate post-partum insertion of IUD was higher, but the benefits of providing a highly effective contraception immediately after delivery outweigh this disadvantage. These benefits confirmed by Washington *et al.*<sup>10</sup> on cost-effectiveness of post-partum intrauterine device placement.

In a prospective study on IUD expulsion after cesarean delivery, Levi *et al.*<sup>11</sup> reported no expulsions on the 6 week follow-up visits. This result is surprisingly low comparing to our result.

Jaltaoui *et al.*<sup>12</sup> found (17%) expulsions in their prospective cohorts of 100 IUD insertion attempts.

Chi *et al.*<sup>13</sup> reported 4.1% expulsion rate, Muller *et al.*<sup>14</sup> in 2005 reported 6% expulsion rate, Celen *et al.*<sup>15</sup> reported the number of expulsion as high as 17.6%.<sup>9</sup> Goldstuck and Steyn<sup>16</sup> reported 5-15% expulsion rate with additional information that there were higher expulsion rate on older models of IUD.

IUD with additional thread modification also has varied numbers of expulsion rate. Treiman and Liskin<sup>17</sup> reported that the additional threads on the IUD reduced the number of expulsion in a few, while Chi<sup>18</sup> reported 1.2% expulsion rate. Hernandez<sup>19</sup> reported the addition of thread slightly reduce the expulsion rate. The Cochrane Collaboration in 2010 reported that added absorbable threads or other parts seems less useful and only have few effects in preventing expulsions<sup>5,17-20</sup>. Another Cochrane Library on immediate post-partum insertion of IUD reported that expulsion was more likely to happen in immediate insertion group compare to interval insertion group within 6 months<sup>21</sup>. Similar results found in a systematic review on IUD insertion in the postpartum period<sup>22</sup>.

The result of this research is that although from the master table it seemed like sutured IUD have effects in reducing expulsion rate, there were no statistically significant effects of sutured IUD on the expulsion rate.

Although this research was conducted a few years ago, the results are still relevant to this day. The rate of IUD expulsion apparently is reduced into minimal using this approach. Hence, this research can direct other authors for future research to authenticate these findings and to find other ways in order to reduce the IUD expulsion rate. There are also limitations in this study since there are other factors that can affect the outcome after IUD insertions, such as the infection in the endometrium that could appear after IUD insertions, the inexperienced installers of IUD and the type of IUD used-older models of IUD have higher expulsion rate. Those factors can make the result of this study biased. The future study is expected to validate the previous research by excluding other factors that affect the outcome of IUD insertions.

## **CONCLUSION**

Intrauterine device (IUD) fastening was less useful for continuity in post-partum contraception family planning with trans-cesarean method. There were differences in the number of IUD expulsion between IUD non-sutured and with sutured (11.4 vs. 0%). However, those numbers are not statistically significant.

## **SIGNIFICANCE STATEMENTS**

Inserting intrauterine device (IUD) right after childbirth is advantageous for many reasons. The timing is very well-situated for the patient. The IUD is also a long acting reversible contraceptive method that is suitable for use in all women undergoing cesarean section. However, there's a major risk associated with the use of IUD which is the possibility of its expulsion. This study determines the possible effect of IUD fastening on lowering expulsion incident, which could be beneficial for family planning after giving birth with trans-cesarean method.

## **ACKNOWLEDGMENTS**

Authors would like to thank the staffs at Dr. M. Djamil General Hospital, Dr. Reksodiwiryo Military Hospital and Painan District Hospital who facilitated us in the collection of data.

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