

## *Full Length Research Paper*

# **The outcome of continuing intrauterine pregnancies in presence of intrauterine contraceptive device**

**Dr. Tarek Ramadan Abbas MD**

*Obstetrics and Gynecology Department, Al-Azhar Faculty of Medicine*  
Email: [isia992018@yahoo.com](mailto:isia992018@yahoo.com)

Received 4 April, 2016; Accepted 14 April, 2016

Our study aim to investigate the outcome of intrauterine pregnancies with retained or removed intrauterine devices (IUDs). In a retrospective study, we reviewed medical records of women who had CuT380 IUD and got pregnant from February 2011 to February 2016 in Bab Alshaaria university hospital, 192 pregnancies with IUD were analyzed. IUDs were removed from 152 patients and retained for 40 patients. The combined risk of adverse pregnancy outcomes (miscarriage, intrauterine fetal death, intrauterine growth retardation, preterm birth and preterm premature rupture of membranes) was 36.8% in the IUD-removed group and 63.3% in the IUD-retained group [ $p < 0.01$ ; relative risk (RR) = 2.0; 95% confidence interval (CI) 1.3–3.3]. Newborns of the IUD-retained women had significantly lower Apgar scores and significantly higher admission rate to the neonatal intensive care unit than IUD-removed women ( $p < 0.01$ ; RR=4.5; 95% CI 1.5–12.9). Women who conceived with an IUD and chose to continue the pregnancy without removing the IUD need close followup, as there appears to be higher risk of adverse pregnancy and neonatal outcome. Furthermore, when the IUD is retained, there is increased risk of miscarriage and adverse pregnancy outcome compared to removal of the IUD.

**Keywords:** Intrauterine Pregnancy; Intrauterine contraceptive device.

## **INTRODUCTION**

Intrauterine devices (IUDs) are used for contraception worldwide. IUDs are the second most used method worldwide and the fifth most used modern contraception method in the United States (De Araujo et al., 2008; Rivera et al., 1993; Mosher and Jones, 2010). The failure rate of this contraceptive method ranges from 0.3 to 2.3% (Russell, 2011).

Convincing evidence has demonstrated that pregnancies with an IUD are associated with an increased risk of spontaneous abortion and preterm delivery and the risk of maternal septic complications also increases in such cases. It has been reported that the miscarriage rate is reduced if the IUD is removed in early pregnancy, and it is recommended that the IUD should be removed during the first trimester of pregnancy. However, if the IUD remains in the uterine cavity during pregnancy, the management of such pregnancies pretenses a clinical challenge (Speroff and Darney, 1996).

Studies exploring why pregnancies occur despite the presence of an IUD suggested composition of IUD(copper surface area), duration of use, IUD position, age of women, history of expulsion and failure of the IUD as risk factors for the efficacy of IUD (Thonneau et al., 2001; Thonneau and Almont, 2008). Some authors have recommended removing the IUD during the first trimester of pregnancy to prevent septic complications and miscarriages (Skjeldestad et al., 1988; Horn et al., 2001). A retrospective study has shown that continuing pregnancies with a retained IUD have risks, such as preterm delivery and chorioamnionitis. However, randomized controlled studies comparing different management strategies of pregnancies with an IUD in place are needed(Ganer et al., 2009).

The World Health Organization has a recommendation protocol regarding the sequence of actions to be taken in the event of a pregnancy in the presence of an IUD. This protocol embraces ruling out

ectopic pregnancy and a recommendation to remove the IUD if the string is visible and the device can easily be removed through the cervix. This recommendation is grounded mainly on articles from the 1970s and 1980s (Alvior Jr, 1973).

In light of the inadequate research of pregnancies with IUDs, the need arises for a research with a large series of pregnancies, which will resource an up-to-date conclusion regarding obstetric complications that occur in the presence of IUD and the incidence of complications after removal of the device at the beginning of the pregnancy.

This study aimed to evaluate the pregnancy outcomes of women who conceived despite the presence of CuT380AIUD and decided to continue the pregnancy.

## MATERIALS AND METHODS

In a retrospective study, we reviewed the medical records of women who had CuT380 IUD and get pregnant from February 2011 to February 2016 in Bab Alshaaria university hospital; patients found to be pregnant during the examination are offered to remove the IUD if the strings are visible. Routine ultrasound examination is performed for IUD location. The IUD is removed by gently pulling the thread from the patients in whom the IUD tail is still visible.

If the thread is inaccessible, no attempt is made to remove the IUD. Clinical records during the study period have been combed. All of the IUDs were CuT380A. Clinical patient characteristics, such as maternal age, obstetric history, gestational age and medical history were evaluated. Early pregnancy losses were recorded and the ongoing pregnancy outcomes were evaluated for mode of delivery, birth weight, 5-min Apgar scores, admission to neonatal intensive care unit (NICU) and obstetric complications. We also evaluated the maternal serum Creactive protein (CRP) level, white blood cell count (WBC) as markers of the inflammatory response.

The normality of the data was tested using Shapiro-Wilk and Kolmogorov-Smirnov tests. Since the data were normally distributed, mean and standard deviation were reported for continuous variables, and the number and percentage were presented for categorical variables. Comparisons of proportions were performed by  $\chi^2$  or Fisher's exact tests. Associations between the presence of IUD in pregnancy and the obstetrical outcomes were analyzed by means of logistic regression models with adjustment for confounding factors: maternal age, parity, history of preterm birth, and gestational age at delivery. A  $P$  value  $< 0.01$  was considered statistically significant. The statistical analyses were performed using SPSS version 12.0.

## RESULTS

The study involved 211 patients who had an IUD at the time of pregnancy diagnosis and did not want the termination of the pregnancy. Nineteen patients were excluded after the diagnosis of an ectopic pregnancy. Patients with IUD expulsion before the diagnosis of pregnancy were not included in the study. Thus, the study consisted of the remaining 192 patients. All of the pregnancies were singleton. Moreover, 152 patients had chosen the IUD to be removed during the first trimester, and the IUD was retained in the remaining 40 patients.

The clinical characteristics are abridged in (Table 1). There was no significant difference between the groups in terms of age and parity. The mean gestational age at the time of diagnosis was  $8.1 \pm 2.4$  weeks for the IUD-removed group and  $9.2 \pm 3.5$  weeks for IUD-retained group ( $p = 0.1$ ). Table 1 shows 97 patients (63.8%) in the IUD-removed group and 15 (37.5%) patients in the IUD-retained group delivered at term. The difference between the groups for term pregnancies (deliveries of gestational week  $\geq 37$  weeks) was significant ( $p < 0.01$ ) [relative risk (RR): 0.6, 95% confidence interval (CI): 0.4–0.9]. The combined risk of adverse pregnancy outcomes (miscarriage, intrauterine fetal death, intrauterine growth retardation, preterm birth and preterm premature rupture of membranes) was 37.5% ( $n = 57$ ) in the IUD-removed group and 65% ( $n = 26$ ) in the IUD-retained group ( $p < 0.01$ ) (RR: 2.0, 95% CI: 1.3–3.3).

There were less miscarriages in the IUD-removed group than the IUD-retained group ( $p < 0.01$ ) (RR: 2.0, 95% CI: 1.3–3.3). Twenty-four (15.7%) pregnancies in the IUD-removed group and 11 (27.5%) pregnancies in the IUD retained group were complicated by vaginal bleeding during the first trimester ( $p = 0.2$ ) (RR: 1.7, 95% CI: 0.8–3.5). There was no statistically significant difference in terms of intrauterine growth retardation (IUGR), oligohydramnios and preterm premature rupture of membranes (PPROM) between the two groups. There were no women with clinically diagnosed chorioamnionitis. The median gestational week at birth for the IUD removed group was 39.1 weeks and was 37.4 weeks for the IUD-retained group ( $p < 0.01$ ). There was no statistically significant difference between the groups in the terms of mode of delivery and median birth weight (Table 1).

Three babies had an Apgar score below 7 at 5 min after delivery in the IUD-retained group, while two babies had a low Apgar score in the IUD-removed group ( $p = 0.01$ ) (RR: 10.8, 95% CI: 1.04–111.6). Nine (5.9%) babies born from IUD-removed women and 7 (17.5%) babies born from IUD-retained women were admitted to the NICU ( $p < 0.01$ ) (RR: 4.5, 95% CI: 1.5–12.9). There was no newborn with congenital anomalies in either group. There were no obstetric or postpartum

**Table 1.** Comparison of clinical and laboratory characteristics and obstetric outcome of patients regarding pregnancy in presence of IUD

	<b>IUD-removed group n=152 (79.1%)</b>	<b>IUD-retained group n=40 (20.9%)</b>	<b>p value</b>
Age (mean, year)	23.2±4.3	25.6±5.2	0.2
Parity (median)	3 (1–6)	2 (1–4)	0.6
Gestational week at diagnosis (mean)	8.1±2.4	9.2±3.5	0.1
First-trimester bleeding n (%)	24 (15.7%)	11(27.5%)	2
First-trimester bleeding outcome, n			
Miscarriage	9	5	
Preterm birth	5	0	
Term birth	9	5	
Miscarriage, n (%)	37 (24.3%)	20 (50%)	<0.01
Gestational week at birth (median)	39.1 (26–41)	37.4 (24–40)	<0.01
Birth weight (median, g)	3490 (820–4600)	3310 (700–4100)	0.7
Preterm premature rupture of membranes, n (%)	3 (1.9%)	2 (5%)	0.5
Adverse pregnancy outcome, n (%)	57 (37.5%)	26 (65%)	<0.01
Term birth n(%)	97 (63.8 %)	15 (37.5 %)	<0.01
Laboratory findings			
Median CRP (mg/L),	8.1 (0.9–40)	18.2 (2.2–27.5)	0.9
Mean WBC,	9,816±3109	10,213±4190	0.7
NICU, n (%)	9 (5.9%)	7 (17.5%)	<0.01
Apgar at 5 min <7, n (%)	2 (1.3%)	3 (7.5%)	0.01

Statistical significance ( $p < 0.01$ ) is stated as bold and underlined.

complications noted in the records.

The mean WBC and median of CRP levels were not statistically insignificant between the IUD retained and IUD-removed groups (Table 1). While WBC data were available for all of the patients, CRP levels were available only for some of the women as it is no tour routine practice to measure CRP. Thus, the results of the statistical analysis have limitations.

## DISCUSSION

Preceding studies have found adverse obstetric outcomes in women carrying an IUD, for example, preterm delivery, low birth weight, and chorioamnionitis, however, these studies were relatively small (Alvir Jr, 1973; Kim et al., 2010; Simpson, 1985). In the present study, the overall incidence of adverse pregnancy outcomes was higher in the IUD-retained group than the IUD-removed group. The two groups were similar in terms of age and parity, which would be important confounding factors for many pregnancy outcomes. This finding and the incidences were similar to the results offered by other authors (Von Theobald et al., 1990; Mermet et al., 1986).

There is a statistically significant increased risk of miscarriages in women with a retained IUD compared to those with a removed IUD. Most of the observational

studies and one prospective study have braced this finding (Inal et al., 2005; Deveer et al., 2011). The IUD-retained women delivered babies with a lower gestational week compared to the IUD-removed women.

Although not statistically significant, pregnancies in the presence of an IUD have a higher incidence of preterm delivery and PPRM compared to IUD-removed women. Studies have postulated a high incidence of preterm delivery in the IUD-retained group with statistical significance (Ganer et al., 2009; Alvir Jr. 1973; Inal et al., 2005). However, the difference between the groups in these studies, in terms of preterm delivery, was not confirmed with statistical analysis in a systematic review by Brahmi et al. 2012. Also, a study by Kim et al. 2010 reported a higher PPRM incidence in pregnancies with an IUD in situ. Prospective controlled studies are needed to explain this question. In contrast to previous studies (Brahmi et al., 2012), there were more newborns with a low Apgar score in the IUD-retained women in the present study. The need for the NICU was also significantly greater for the IUD-retained women.

Pregnancy among IUD users is not uncommon. However, arguments over management of such pregnancies continue due to absence of randomized controlled trials about the prognosis of pregnancies conceived in the presence of an IUD (Owen et al., 2013). Therefore, we believe that retrospective cohort studies investigating the results of pregnancies in the presence

of an IUD are still important.

Mean WBC and median CRP higher in the IUD-retained group, but the difference did not reach statistical significance. In their small-sample-size prospective study, Deveer et al. 2011 found a higher CRP level in IUD-retained women and explained this finding as chronic inflammation with a low level of bacteremia. We could only have a small portion of the women's CRP results, and that might decrease the power of these statistical results. As our study is retrospective, a histological evaluation of inflammation was not possible. An evaluation of inflammation with histological and microbiological findings would be more valuable (Fulcheri et al., 2003; Inal et al., 2005).

## CONCLUSION

Women conceiving with an IUD should be informed regarding these outcomes, because IUD removal reduces the risk for adverse obstetric outcomes, but does not eliminate it. Careful surveillance of high-risk pregnancies is necessary, as well as neonatal surveillance in the case of preterm and chorioamnionitic deliveries.

## REFERENCES

- Alvir GT Jr (1973). Pregnancy outcome with removal of intrauterine device. *Obstet Gynecol*; 41:894-6.
- Brahmi D, Steenland MW, Renner RM, Gaffield ME, Curtis KM (2012). Pregnancy outcomes with an IUD in situ: a systematic review. *Contraception*; 85:131-9.
- De Araujo FF, Barbieri M, Guazzelli CA, Lindsey PC (2008). The T 380A intrauterine device: a retrospective 5-year evaluation. *Contraception*; 78:474-8.
- Deveer R, Engin-Ustun Y, Sarikaya E, Aydogan P, Doganay M, Mollamahmutoglu L (2011). Comparison of C-reactive protein levels in pregnancies with retained and removed intrauterine device. *J Matern Fetal Neonatal Med*; 24:1152-4.
- Fulcheri E, di Capua E, Ragni N (2003). Pregnancy despite IUD: adverse effects on pregnancy evolution and fetus. *Contraception*; 68:35-8.
- Ganer H, Levy A, Ohel I, Sheiner E (2009). Pregnancy outcome in women with an intrauterine contraceptive device. *Am J Obstet Gynecol*; 201:381 e1-5.
- Horn LC, Nenoff P, Ziegert M, Hockel M (2001). Missed abortion complicated by Candida infection in a woman with retained IUD. *Arch Gynecol Obstet*; 264:215-7.
- Inal M, Ertopçu K, Ozelmas I (2005). The evaluation of 318 intrauterine pregnancy cases with an intrauterine device. *Eur J Contracept Reprod Health Care*; 10:266-71.
- Inal MM, Ertopcu K, Ozelmas I (2005). The evaluation of 318 intrauterine pregnancy cases with an intrauterine device. *Eur J Contracept Reprod Health Care*; 10:266-71.
- Kim SK, Romero R, Kusanovic JP, Erez O, Vaisbuch E, Mazaki-Tovi S, Gotsch F, Mittal P, Chaiworapongsa T, Pacora P, Oggé G, Gomez R, Yoon BH, Yeo L, Lamont RF, Hassan SS (2010). The prognosis of pregnancy conceived despite the presence of an intrauterine device (IUD). *J Perinat Med*; 38:45-53.
- Mermet J, Bolcato C, Rudigoz RC, Dargent D (1986). Outcome of pregnancies with an intrauterine devices and their management. *Rev Fr Gynecol Obstet*; 81:233-5.
- Mosher WD, Jones J (2010). Use of contraception in the United States: 1982-2008. *Vital Health Stat*; 2010:1-4.
- Owen C, Sober S, Schreiber CA (2013). Controversies in family planning: desired pregnancy, IUD in situ and no strings visible. *Contraception*; 88:330-3.
- Rivera R, Chi IC, Farr G (1993). The intrauterine device in the present and future. *Curr Opin Obstet Gynecol*; 5:829-32.
- Russell J (2011). Contraceptive failure in the United States. *Contraception*; 83:397-404.
- Simpson JL (1985). Do contraceptive methods pose fetal risks? *Res Front Fertil Regul*; 3:1-11.
- Skjeldestad FE, Hammervold R, Peterson DR (1988). Outcomes of pregnancy with an IUD in situ — a population based case-control study. *Adv Contracept*; 4:265-70.
- Speroff L, Darney PD (1996). A clinical guide for contraception. Second Edition. Intrauterine Contraception (The IUD). Baltimore, MD: Williams & Wilkins.
- Thonneau P, Almont T, de La Rochebrochard E, Maria B (2006). Risk factors for IUD failure: results of a large multicentre case-control study. *Hum Reprod*; 21:2612-6.
- Thonneau P, Goulard H, Goyaux N (2001). Risk factors for intrauterine device failure: a review. *Contraception*; 64:33-7.
- Thonneau PF, Almont T (2008). Contraceptive efficacy of intrauterine devices. *Am J Obstet Gynecol*; 198:248-53.
- Von Theobald P, Duchemin JM, Levy G (1990). [The outcome of continuing pregnancies in patients with intrauterine devices. A retrospective study from the Maternity Unit of the University Hospital Center at Caen during the period 1985-1988]. *J Gynecol Obstet Biol Reprod (Paris)*; 19:863-8.

How to cite this article: Abbas TR (2016). The outcome of continuing intrauterine pregnancies in presence of intrauterine contraceptive device. *Int. Inv. J. Med. Med. Sci.* Vol. 3(4): 58-61