A systematic review of some of the side effects of copper T380 intrauterine contraceptive device

Ahmed Nehad Ahmed Hatem Askalani

IAMANEH Scholarship

Reproductive Health Research Course
Geneva, 2006

Introduction

Over the past several decades, new methods of contraception have made contribution to couples well being by allowing them to avoid unwanted pregnancy and improvement in the time of child birth.

(Ruth Simmons; Studies in Family Planning;1997)

- **A revolution of IUD technology occurred in the early 1960s with the development of biologically safe plastic. Later in the 60s, researchers began to wrap plastic devices with copper wire.**

(Irving Sivin et al., Studies in family Planning; 1979)

- **The CuT380 is made of homopolymer of polypropylene to render it radio-opaque.**

(Irving Sivin et al., Fertility and Sterility; 1981)

- **The CuT380 IUD with its proven “T” configuration and more Cu surface area than other available IUDs provides a higher level of effectiveness (PIACT, 1984).**
- **In the CuT380 IUD, collars or cylinders of pure Cu have been placed on the horizontal arm of the “T”. It has 320 mm. sq. of thick Cu wire on the vertical shaft of the “T” a surface area achieved by using more or tighter turns of wire.**
- **Two polypropylene threads are attached to the device.**

Mechanism of action of Cu IUDs

Several mechanisms of action have been suggested (Hatcher RA. Et al., 1984/85):

1. Local foreign body inflammatory response
2. Increased local production of prostaglandins
3. Increased motility of ovum in the fallopian tubes
4. Immobilization of sperm as they pass through the uterine cavity
5. Competition of Cu with zinc, inhibiting carbonic anhydrase and possibly alkaline phosphates

- **During the first months after insertion, CuT380 IUDs decrease the number, directional motility and transport of spermatozoa.**

- **Copper ions seam to inhibit:**

1. Proteolytic enzymes
2. Carbonic anhydrase enzyme

Objectives of the study

- **Review of literature regarding the extent of the main side effects of CuT380 IUD.**
- **Draw simple recommendations, to be effective in reducing the side effects.**
- **This area of research is important as CuT380 IUDs, are widely used as a contraceptive method and complications often arise with their use, which in turn is a wide public health problem.**

Methodology

- **Data from randomized control trials comparing CuT380 IUD with other Cu containing IUDs were included.**

Types of participants:

- **Sexually active women in their reproductive age (18-45)**

Data Base Search revealed:

No. of articles identified was app. 100 articles

No. of articles matching aim of work were app. 37 articles

No. of articles included in this research work is 17 articles

No. of articles included in our result section is 7 articles

Results: Character of included studies

Study	Country Year	Settings	No. of partici-pants	Comparison	Outcome	Comment
Irving S	USA 1981	7 FP Cl. in USA 1972 for 4 yr. follow up	1051	CuT380 with CuT200	Pregnancy Expulsion Bleeding/ Pain Continuation rate	Continuation rate/4 yr. for CuT380 35.1/100 w.
UN Developing Program	Multi center trial a total of 24 centers 1997	Family Planning Clinics Between Jan. 1981-86	2792	CuT380 with CuT220	Pregnancy Expulsion Bleeding/ Pain Perforation	During insertion 3 cases of uterine perforation occurred with CuT220
Gaston F	Multi center Trial of 6 developing countries 1994	Family Planning Clinics A 12 month evaluation	1631	CuT380 with CuT200	Pregnancy Expulsion Bleeding/ Pain Perforation	Preg. Rate for CuT380 was significantly lower.

Results cont…..

Study	Country Year	Settings	No. of partici-pants	Comparison	Outcome	Comment
Gaston F	4 countries 1994	FP Clinics	857	CuT380 with CuT220	Pregnancy Expulsion Bleeding/ Pain Perforation	Preg. Rate for CuT380 significantly lower
Irving S	USA 1965-76	FP Clinics	5348	CuT380 CuT220 CuT200 CuT300	Ectopic Pregnancy	CuT300 discontinued 1974
Subir R	USA 1973-74	FP Clinics	1792	CuT380 with CuT220	Pregnancy Expulsion Bleeding/ Pain	No statistical significant difference

This study compared CuT380 IUD with CuT220, CuT200 and CuT300 IUDs, as regard to pregnancy prevalence (intrauterine or extra-uterine), expulsion rates, perforation, pain & /or bleeding and pelvic inflammatory disease rates.

Cumulative Probability Range of Discontinuation /100w.

	CuT 380	CuT 220	CuT 200	CuT 300
Pregnancy	0.3 - 7.8	0.8 - 5.8	2.6 - 7.8	4.3
Intrauterine Preg.	1.9	5.6	-	-
Extra-uterine Preg.	0.4 - 0.5	0.2	3.6	-
Expulsion	1.4 - 13.2	1.7 - 12.8	3.9 - 9.6	11.9
Bleeding or Pain	4.2 - 35.5	3.6 - 34.3	6 - 22.6	-
Pain	13	11.3	-	-
Bleeding	22	22.6	-	-
Bleeding & Pain	0.9 - 29.7	1.5 - 32.3	3.2	28.5
Perforation	-	0.2	-	-
Continuation Rate	12.3 - 60.5	12 - 58.5	50	41.1
PID	1.1	0.9	-	-
Loss of follow up	38.4	38.8	-	-

Discussion

- **The literature contained little information on the long-term efficacy of copper-releasing IUDs.**

  (Subir R. et al., Am.J Obstet. Gynecol.1979)

- **Bleeding length emerged as an important predictor of discontinuation.**

  (Elizabeth Tolley, International Family Planning Perspectives. 2005)

- **Increased bleeding is the most common side effect reported by IUD users and the most frequent reason for discontinuation.**

- **CuT380 IUDs and CuT220 IUDs, were not statistically different in reporting dysmenorrhea, intermenstrual bleeding or pain.**

  (Gaston Farr et al. Contraception 1994)

Conclusion

- From our brief work, we observed the absence of any statistical differences between study groups.
- There were no significant statistical differences in removal for bleeding &/or pain between the different Cu IUDs.
- Results from trials have shown the efficiency of CuT380 IUDs.

- **World Health Organization studies indicate that improvements in specific parameters of performance of CuT380 IUDs have been translated into increased continuation rates.**

- **To conclude, we should continue the research started, in a wider scope in order to enable us to conclude better results.**

ACKNOWLEDGEMENT

Prof. Dr. Aldo Campana

Dr. Regina Kulier

Dr. Adriane Martin Hilber

Thank You