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Original Research Article

Changing trends in the usage of copper intrauterine contraceptive device: a five year institutional study

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ABSTRACT

Background: Intrauterine contraceptive device is one of the commonest form of long acting contraceptive method (LARC) adapted by reproductive aged women all over the world today. It can be used for 5 to 10 years depending on the type of the device. Aim of the study was to study the institutional rate of copper IUCD usage, rate of removal, side effect profile, indications for removal among women seeking contraception.

Methods: The data regarding the usage of various temporary contraceptive methods were obtained from the family planning unit at our institution SSIMS&RC, Davangere from the records between Jan 1, 2012 to Dec 31, 2016 (5 years). A careful detailed study of records was done on the usage of Cu-IUCD.

Results: During the five year study period, 3,767 women were provided with various forms of contraceptive methods. Cu-IUCD was the commonest method used by women accounting for 42.11% (1586 users). There was a decline in the rate of usage of Cu-IUCD in 2015-16, with increase in the usage of injectables. 179 women requested for removal in the study period, main reason being desire to become pregnant in 73.18% (131) users. Failure rate in the study period was 0.55%.

Conclusions: Cu-IUCD is a safe and effective method of contraception adapted by women of reproductive age. The rate of removal is also low in our study. The decline in the usage of Cu-IUCD during our study period could be attributed to increasing awareness of other methods of LARC.

Keywords: Copper IUCD, Contraception, LARC, Request for removal, Utilization rate

INTRODUCTION

The prevention of conception is contraception. And thus arises the need for awareness of various contraceptive methods either temporary or permanent to prevent conception and thereby avoid unwanted pregnancies. Arriving at a decision to use a contraceptive method is a very emotional and sensitive aspect of the reproductive life of a couple.^{1,2} The decision is based on knowledge, awareness and also at times based on religious beliefs. Hence a clinician needs to be empathetic about the patients beliefs, fertility needs and should be non-judgemental.¹ One of the most common reasons to adapt a temporary contraception is to space between pregnancies and other common reason being pre-existing

medical illness such as severe heart disease, uncontrolled diabetes which at times may warrant them to prevent from conception.³ Amongst the temporary methods of contraception, copper IUCD is the most commonly used and is considered as safe, effective and convenient method which neither requires repetition, nor interferes with sexual activity.⁴

IUCDs are the most commonly used contraceptive method all over the world. It is especially opted by women who want to space between pregnancies, who are breastfeeding, who have a pre-existing medical illness wherein they require to post-pone pregnancy and those who have difficulties using other forms of temporary contraception. The main advantage lies in the fact that it

is long acting and reversible. Also it doesn't need supervision, repetition and does not interfere with sexual activity.

IUCD s have evolved over years. The first widely used IUCD in 1920's was Grafenberg ring in Germany which was made of ring of silkworm gut and silver wire.⁵ This led to introduction of ota ring in Japan which was made of gold or gold plated silver.⁶ Then came into the market inert IUCD's in 1960's which was made of polyethylene a biologically inert plastic material and barium sulphate to render it radio-opaque. Lippe's loop was the first widely used inert IUCD. In India Lippe's loop is distributed free of cost to users through family welfare clinics since 1965. Other inert IUCDs were saf-T coil, M-coil.^{6,7}

Copper releasing IUCD was developed by Jaime Zipper and Howard Tatum in 1970's. They wrapped copper around T and 7 devices to improve the efficacy of the device, which was called Cu-T200 and Cu-7. First generation Cu-IUCD consists of Cu-T 200, Cu-7 and Multiload Cu-250. Second generation Cu-IUCD's had more copper wrapped around the T to improve the life span and effectiveness. They came into market in late 1970's to 1980's as Multiload Cu-375, Nova-T, Cu-T 380Ag, Cu-T 380A, Cu-T380S. Multiload Cu-250 and ML Cu-375 are recommended for 3 and 5 years respectively. Cu-T 380A which is widely used is recommended for 10 years and is supplied free of cost by government of India. Cu-T 200 is recommended for 5 years.⁸

Hormone impregnated IUCD's (Mirena) have been approved for contraceptive use. Mirena releases 20microgm of levonorgestrel per day and is recommended for 5 years.

By far the most popular Cu-IUCD is Cu-T380A, which is widely used all over the world. Cu-T380A is a T shaped device made of polyethylene impregnated with barium sulphate. It has 314 sqmm. of copper wound around the vertical stem and 33 sqmm. on transverse arms of T.^{8,9} The device is inserted into the uterine cavity by withdrawl method. The timing of insertion is usually immediately after the stoppage of menses (proliferative phase) so that pregnancy is ruled out. It can also be inserted in immediate postpartum and postabortal period, only when there are no signs of sepsis. If not inserted with in the immediate postpartum period, it can be inserted in postpartum women only after 4 weeks of delivery. Cu-IUCD is considered safe in lactating women. It can also be used as an emergency contraception when inserted within 5 days of unprotected sexual intercourse.

The precise mechanism of action of Cu-IUCD is still not known. They are known to act locally and not systemically. Cu-IUCD produces a foreign body reaction which causes polymorphs, giant cells, mononuclear cells,

plasma cells and macrophages to appear in the endometrium, uterine and tubal fluids. These cells are known to phagocytose sperm and ova and thereby prevent fertilization. Besides this, inflammatory reaction induced in endometrium creates a hostile environment for the implantation of the fertilized ovum. Sperm motility, capacitation and survival are also affected by biochemical changes in cervical mucus produced by copper. Ovulation is not affected by Cu-IUCD. Cu-IUCD protects against both intrauterine and ectopic pregnancy.⁹

Efficacy of Cu-T380A is high with a failure rate of less than 1% per year with consistent/prolonged use. Women should be counselled about the chances of expulsion which is high in the first three months after insertion (1 in 20) and also high if inserted immediate postpartum. She should also be informed that Cu-IUCD does not protect against STD's and that menstrual periods may be heavier, longer at least for the next 2-3 cycles and also about inter-menstrual and premenstrual spotting. Complications such as perforation (1.2 per 1000), partial /complete expulsion, abnormal vaginal discharge and infection needs to be counselled about.

The absolute contraindication for the usage of Cu-IUCD is present pregnancy, unexplained vaginal bleeding, active pelvic infection, any suspected gynaecologic malignancy and distorted uterine cavity by fibroids/bicornuate uterus.^{10,11}

Hence it is important to identify the ideal candidates for Cu-IUCD insertion, and ideal timing of insertion. Appropriate counselling coupled with identification of complications, side effects and reasons for removal are known to improve the utilization rate of the device. This study aims at determining the rate of utilization of Cu-IUCD, side effects, reason for removal at SSIMS&RC, Davangere, Karnataka, India.

METHODS

This is a retrospective study carried out at the family planning unit of the department of obstetrics and gynaecology at SS Institute of Medical Sceinces and Research Centre (SSIMS and RC), Davangere, Karnataka, India. SSIMS and RC is a tertiary care hospital attached to the medical college, located in davangere and caters for a female population of 2,15,195 according to 2011 census. The family planning unit is run by doctors, nurses, ancillary health workers in the department of obstetrics and gynecology. The government of India supplies copper T-380A free of cost to all the primary health centres, government hospitals, private hospitals. Women attending family planning unit are given a cafeteria of choices and copper IUCD is the most commonly opted method of contraception. Clients are given detailed information about the benefits, side effects, complications and usage period of various contraceptive methods. Clients are allowed to make an informed choice.

The family planning unit is a part of the department of obstetrics and gynaecology and records are maintained meticulously and reviewed regularly. At first visit, counselling is done and a detailed gynaecologic and medical history is taken. General physical examination, systemic and pelvic examination is done and any contraindication for the contraceptive usage and pregnancy is ruled out. Relevant investigations are requested as per the doctor's advice. Women choosing Cu-IUCD is fitted with the device. At our centre, Cu-T380A is fitted as it is supplied by the government of India free of cost. Women are advised to review after the next menses to check for the threads and subsequently they are reviewed at 3 months and yearly once.

The data of the users of Cu-IUCD was obtained from family planning unit from January 1, 2012 to December 31, 2016 (5 year study period). During the same time period the record of users of various other forms of contraception were also obtained. The parameters reviewed amongst the Cu-IUCD users were age, parity, education and reasons for removal. The results were analysed using simple ratios and percentages.

RESULTS

During the 5 year study period, 3767 women were provided with various forms of contraceptive methods. Table 1 depicts the year wise distribution of various contraceptive methods during the study period.

Table 1: Summary of different contraceptive methods opted by women attending family planning unit during the 5 year study period.

Method	2012	2013	2014	2015	2016	Total	%
IUCD	491	372	302	243	178	1586	42.11
Injectables	94	108	183	253	302	940	24.95
Pills	86	78	105	123	126	518	13.75
Condoms	72	87	83	96	68	406	10.77
Sterilization	68	62	51	64	72	317	8.42
Total	811	707	724	779	746	3767	100

Cu-IUCD is the commonest form of contraceptive method used by women attending the family planning unit at SSIMS&RC during the 5 year study period (2012-2016) with a rate of 42.11%. However, the demand for Cu-IUCD has declined from 60.54% in 2012 to 31.19% in 2015 and to 23.86% in 2016. This can be attributed to increasing usage of injectables and pills over this time period of study and also there is increasing awareness about other LARC methods.

The age wise distribution of Cu-IUCD in the study period is depicted in Table 2.

Table 2: Year wise age distribution of Cu-IUCD users during the study period.

Age (years)	2012	2013	2014	2015	2016	Total	%
15-19	3	10	9	4	2	28	1.77
20-24	199	139	87	54	44	523	32.98
25-29	240	157	155	139	102	793	50
30-34	35	38	34	28	18	153	9.64
35-39	7	19	12	13	10	61	3.85
40-44	7	9	5	5	2	28	1.76
Total	491	372	302	243	178	1586	100

Mean age: 28.4 +/- 2.2 years

Out of 1586 women using Cu-IUCD, highest number belonged to 25-29years age group accounting for 50%.

Correspondingly there was a steady decline in the request for IUCD with increasing age and more than 45 years of age none of them requested for IUCD.

Evaluating the educational level amongst the Cu-IUCD users, 126 (7.94%) women were found to be uneducated, 356 (22.45%) women had primary education, 574 (36.19%) women had secondary education, 272 (17.15%) women went to pre-university college and 258 (16.27%) women went to university college and were degree holders. This reflects that women who were educated (secondary education and above) were the ones who chose to use Cu-IUCD. Lack of education and knowledge was consistently associated with lower utilization rate of Cu-IUCD.

In this study all women were married and none of the unmarried women opted for Cu-IUCD.

Table 3: Yearly request for Cu-T removal among the users.

Year	No. of patients requesting removal
2012	38
2013	43
2014	36
2015	28
2016	34
Total	179

Out of 1586 women using Cu-IUCD over the 5 year study period, 719 (45.34%) women were para 2, 324 (20.43%) women were para 3, 460 (29%) women were para 1 and 83(5.23%) women were para 4. None of the nulligravida women chose Cu-IUCD as the contraceptive method of choice.

During the 5 year study period, 179 women chose for the removal of Cu-IUCD accounting for 11.28%. The most common indication for request of removal was the desire to become pregnant which accounted for 73.18% (131 users). 6.7% (12 users) requested for removal and reinsertion. 6.14% (11 users) requested for removal and subsequently chose sterilization. 7 women (3.92%) requested removal for abnormal vaginal bleeding, 5 (2.79%) of them for abnormal vaginal discharge, 6 (3.36%) of them for lower abdominal pain. 4 (2.24%) of them had come with missing threads and on clinical and ultrasound examination the 3 of them were found to be inside the uterine cavity and one was displaced into the cervical canal. All these 4 women requested for removal. In the 5 year study period there was only 1 failure accounting for 0.55%. Uterine perforation was not recorded in any case. The low failure rate reflects that Cu-IUCD is highly effective method of contraception. The low failure rate could also be due to loss of follow up during the study period. Table 3 shows the yearly request for removal of Cu-IUCD and Table 4 shows indications for request of removal of Cu-IUCD.

Table 4: Indications for removal of Cu-IUCD during the 5 year study period.

Indications	Number	%
Desire for pregnancy	131	73.18
Removal and reinsertion	12	6.7
Removal and request for sterilization	11	6.14
Abnormal vaginal bleeding	7	3.92
Abnormal vaginal discharge	5	2.79
Lower abdominal pain	6	3.36
Missing threads	4	2.24
Dysmenorrhea	2	1.12
Failure	1	0.55
Total	179	100

DISCUSSION

Contraceptive usage has been steadily increasing among the reproductive age women in order to avoid unwanted pregnancies and its complications. Cu-IUCD is the most common temporary form of contraception opted by women attending family planning unit at SSIMS&RC. A total of 3767 women were offered various forms of contraception during the study period. There is a yearly decline in rate of Cu-T usage among women and there is higher request for others forms of contraception such as injectables and pills. The demand for Cu-IUCD has declined from 60.54% in 2012 to 31.19% in 2015 and to 23.86% in 2016 in our study. Similar finding was noted

by Muthin et al and Oguanuo et al.^{12,13} A study conducted in zaria shows that injectable contraceptive were most commonly utilized.¹⁴

The increasing demand for a long acting contraceptive method as Cu-IUCD in the peak of the reproductive age (25-29 years) accounting for 50 % of the users and more so in educated women reflects that women seek to aspire a peak in their professional career and hence they wanted to prevent unwanted pregnancies.

Parity distribution revealed that majority of Cu-T users belong to para 2 accounting for 45.34% and para 3 accounting for 20.43%. None of the nulliparous women opted for Cu-IUCD. The main reason for adopting Cu-IUCD among para2-para3 was the need to space between pregnancies and also to gain some time before they go for permanent sterilization.

Women who are educated more so when they had secondary education and above, chose Cu-IUCD as the method of choice for contraception. Cu-IUCD usage was less prevalent in women who were uneducated. It reflected that lack of education was associated with lesser utilization of any contraceptive method and more were the incidences of unwanted pregnancies. This finding was similar to that obtained in 2003 National Health and Demographic Survey.¹⁵

A total of 179 women requested for removal during the 5 year study period. The request for removal was commonest among those who desired to become pregnant accounting for 73.18% of removal. Removal and reinsertion was chosen in 6.7% of the users. 6.14% of users requested removal followed by permanent sterilization. Other causes for removal of Cu-IUCD were: abnormal vaginal bleeding, abnormal vaginal discharge, lower abdominal pain and dysmenorrhoea.^{16,17} There were 4 cases of missing threads in the study period and 3 of them were found to be in uterine cavity and only 1 was partially displaced into the cervical canal.

Rate of failure is significantly reduced with long acting contraceptive method such as Cu-IUCD. In our study the failure rate was 0.55% for the 5 year study period. Pearl Index describes failure rate which is calculated by number of failures per 100 women using the contraceptive for a year.¹⁸ CuT 380A has a failure rate between 0.1 and 1% after the first year of use and 2.2% for Cu-T380A after 12 years.¹⁹⁻²¹ The low failure rate in our study could be due to higher efficacy of Cu-T380A and also due to loss of follow up. Over the time period the patients have reported less pain and bleeding as side effects.

CONCLUSION

Desire to accept the various forms of contraception to limit the family size and to prevent unwanted pregnancies are steadily on rise. Cu-T 380A is the most effective and

safe form of contraception which offers the benefit of being long acting, reversible type of contraception. The main side effect leading to removal of Cu-T380A was abnormal vaginal bleeding. Although patients have reported less incidence of pain and abnormal vaginal bleeding over 5 years of study period there is a yearly decline in the rate of Cu-IUCD usage which could be attributed to increasing awareness of other forms of long acting reversible contraceptive (LARC) methods. Efforts should be made to spread awareness amongst all reproductive age women about the benefits of using Cu-IUCD to further improve the utilization rate.

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