

Editorial

Reviving Intrauterine Device (IUDs)

Introduction

Introduction : The intrauterine device (IUD) is the most cost-effective reversible method of contraception today. However, it is used by 14.5% of women of reproductive age group in developing countries and only 7.6% in developed countries¹. Highest use of intrauterine devices are found in Eastern Asia and the lowest in North America. Currently available intrauterine devices have evolved to the point in efficacy and safety which is comparable to oral contraceptives. However, complications occurred due to previous devices and therefore available IUDs have remained largely under used by all providers of reproductive health care. With the development of newer technologies and recent medical data refuting many of the medical – legal misconception, the use of IUDs should increase drastically in the coming years. These IUDs not only increase the efficacy close to 100% but also reduce the rate of expulsion and the number of removals for medical reasons.

Evolution of IUDs : Modern use of intrauterine device dates back to the early 1900s, when a physician from Germany, Richard Richter (1909), first introduced IUD as a contraceptive method. Later on Erust Grafenberg from Germany and T Ota from Japan designed IUDs made of silkworm gut with silver wire and gold or gold plated silver, respectively, which were widely accepted. In 1964, The Population Council established a Cooperative Statistical Programme (CSP) which evaluated plastic IUDs made of polyethylene, a biological inert plastic material designed by Lazar Margulies and Jack Lippe of New York and concluded that these IUDs were safe and effective method of contraception, appropriate for use in national family programme.

But in 1967, many women who developed severe pelvic infection while using a dalkon shield filed lawsuit against the manufacturer resulted into the negative media attention and a sharp decrease in the use of all IUDs.

In 1970, the first medicated device CuT 200, Cu 7 and Multiload 250 were developed in order to reduce some of the earlier drawbacks. To improve life span and effectiveness, second generation copper releasing IUDs like Multiload 375, Nova T, CuT 380Ag were introduced. In 1974, the progestasert, a hormone releasing IUD was first marketed which contained 38mg progesterone released at a rate of 65 mcg per day for one year. Later on, a long lasting levonorgestrel (LNG 20, Mirena) releasing IUDs were developed which are effective for 5 yrs with lower failure rates and are associated with less pains and bleeding. Recently frameless IUDs (Fixed and flexible) GyneFix (Copper) and FibroPlast (levonorgestrel releasing 14 mcg/day) are developed to reduce further concerns.

Mechanism of actions: Several mechanisms are responsible for the contraceptive effect of the IUDs. They act mainly by preventing sperms from fertilizing ova. All inert and copper device produce an inflammatory reaction resulting into cellular and biochemical changes in the endometrium, uterine and tubal fluids. Through the process of phagocytosis sperms and ova are engulfed and thus prevent fertilization. IUD also causes delayed or derranged normal cyclical changes in the endometrium and liberate prostaglandins making it hostile for implantation of blastocyst. Copper interferes with enzymes in the uterus, glycogen metabolism and estrogen uptake by the uterine mucosa. Copper also causes biochemical changes in cervical mucosa affecting sperm motility, capacitation and survival.

IUDs containing progesterone prevent sperm passing through cervical mucus. They also maintain the high progesterone levels and low estrogen levels hence, alter the endometrium for implantation. It has been reported that 1 to 3 women per 1000 became pregnant in the 1st year of use of LNG IUD compared to 3 to 8 women per 1000 in the 1st year of use of CuT 380Ag². LNG IUDs are as effective as sterilization and are easily reversible³.

With LNG IUS no significant change in blood pressure, serum lipids, coagulation factors, carbohydrate metabolism and liver functions were observed. They do not affect lactation, infant growth and development when inserted postpartum. Recently they are also used as an emergency contraception.

Complications: In cases of menorrhagia and pain with Copper IUDs, NSAIDs should be considered as first line therapy and if ineffective, tranexamic acid may be considered as second line therapy. Intermenstrual bleeding can occur primarily due to mechanical damage to the endometrium and subsides within one or two months. With LNG 20 amenorrhoea has been observed. Recent studies concluded that the newer IUDs, (especially LNG 20) do not increase the risk of pelvic inflammatory disease or tubal infertility when used in appropriately selected patients. However in 2006, Mohilajee AP et al from six prospective studies reported that women with chlamydial infection or gonorrhoea at the time of IUD insertion were at an increased risk of PID compared to women without infection⁴. Incidence of uterine perforation is found less than 1 per 3000 insertions with newer devices such as MLCu 250, MLCu 375, CuT 380 Ag and Nova T. Since copper devices produce omental masses and adhesions and progesterone devices cause intra-peritoneal bleeding, they require urgent removal. WHO multicentre study reported that IUD users are 50% less likely to have ectopic pregnancy than women using no contraception and the incidence is 0.25 - 1.5 per 1000 women year. This complication can be reduced by avoiding IUD insertion in women with history of PID, ectopic pregnancy and in those who have multiple sexual partners³. In 2008, Curtis KM et al reported that use of IUD does not increase the risk of cervical and breast cancers and at the same time decreases the risk of endometrial cancer⁵.

Non-contraceptive Therapeutic Uses of LNG IUS in Gynaecology : Because of the local progestogenic effects, LNG IUS reduce menstrual flow which benefits patients with anaemia and DUB, reduce pain and dysmenorrhoea in endometriosis and adenomyosis, has beneficial effects on fibroid and protect postmenopausal women from endometrial hyperplasia who are on ERT. In 2002, Wildemeersch D et al concluded that LNG IUS is effective in significantly reducing the amount of menstrual blood loss in women with menorrhagia due to DUB and intramural and subserosal fibroid uterus⁶. In 2005, Verzellini P et al reported that in patients with symptomatic

endometriosis when LNG IUS were used, resulted into 70 to 80% reduction in monthly blood loss, about 20 to 30% had amenorrhoea and also there was reduction in pelvic pain caused by peritoneal and recto-vaginal endometriosis⁷. Since its launch in 1990, LNG IUS have become available in more than 100 countries throughout the world and majority of them having approval for the treatment of above gynaecological conditions⁸.

Conclusions: Newer IUDs not only have potent contraceptive effect but also have strong endometrial suppression effect resulting into usage in many of the gynecological conditions also. The newer IUDs if well promoted by all gynaecologists, I am sure in years to come, (like in China) the number of female sterilization and hysterectomies will fall drastically and will revive the popularity of intrauterine devices all over the world.

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Purandare C N

Purandare Griha,
31/C, Dr. N. A. Purandare Marg, Mumbai - 400 007.
Email : dr.c.n.purandare@gmail.com; Mobile : 98200 88183