PROSPECTIVE STUDY OF INTRAOPERATIVE INTRAUTERINE CONTRACEPTIVE DEVICE APPLICATION DURING CAESERIAN SECTION

Thesis

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List of abbreviations

	Title
2D US	TWO- Dimensional transvaginal Ultrasound
3D PD	3 D Power-Doppler Ultrasound
3D-US	Three - Dimensional Ultrasonography
4-D	Four – Dimensional
ACOG	American College of Obstetricians and Gynecologists
CDR	Cesarean Delivery Rate
CPD	Cephalo pelvic Disproportion
CS	Cesarean Section
C – Section	Cesarean Section
CTG	Cardiotocography
D-D	Decision to Delivery
ERCD	Elective Repeat Cesarean Delivery
FI	Flow Index
IPP	Immediate Post-placental
IPPI	Immediate post- placental insertion
ICU	Intrauterine contraception
IUCD	Intrauterine contraception device
IUD	Intrauterine device
MRSE	Methicillin-resistant staphylococcus epidermis
NSAIDs	Non steroidal anti inflamatory Drugs
PID	Pelvic Inflamatory Disease

PVC	Polyvinyl Chloride
RCA	Royal College of Anaesthetists
RCOG	Royal College of Obstetricians and Gynaecologists
RCT	Randomized controlled trial
STDs	Sexually- transmitted diseases
TA	Transabdominal
TV	Transvagial
US	Ultrasonography
VBAC	Vaginal Birth after Cesarean
VFI	Vascular-Flow Index
VI	Vascularization Index
WHO	World Health Organization

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Introduction

Each year, more than 100 million women make decisions about beginning contraception after child birth. Proper family planning programs and adequate methods of contraception are important tools to avoid many problems in our world **(Shaamash et al., 2005)**.

Contraception, socially recognized and accepted only in the last 30 years, is both an essential and complicated part of modern life. Contraception has separated sex from procreation and has provided couples greater control and enjoyment of their lives. It is critical element in limiting population, thus preserving our planet's resources and maintaining quality of life for ourselves and our children. Contraception is both personal and a social responsibility. This could not be achieved by the simple contraceptive methods employed before the late 20^{th} century. Greater effectiveness and ease of use required more complicated methods, associated with greater consequences to our health **(Speroff and Darney, 2005)**.

Intrauterine Contraception (IUC) is the most widely used method of reversible fertility regulation in the world. Over 100 million women worldwide use it for contraception **(Population Report, 2007)**.

Cesarean delivery is defined as the birth of a fetus through incisions in the abdomianl wall (laparotomy) and the uterine wall (hysterotomy). This definition does not include removal of the fetus from the abdominal cavity in the case of rupture of the uterus or in the case of an abdominal pregnancy **(Cunningham et al., 2010)**.

Aim of the work

The aim of the work is to assess the efficacy, safety, convenience and complications of copper IUCD inserted immediately after expulsion of the placenta during lower segment caesarian section. This is carried out by clinical assessment and follow- up abdominal ultrasound.

Intrauterine device

The Intrauterine Device (IUD) is the most widely used reversible form of contraception in the world **(Nelson et al., 2006)**.

Historical overview:

A frequently told, but not well-documented story, assigns the first use of IUD to caravan drivers who allegedly used intrauterine stones to prevent pregnancies in their camels during long journeys **(Speroff and Darney, 2005)**.

The first IUDs for women were developed in nineteenth century in Germany as variation of vaginal pessaries. These early IUDs were rigid metal appliances, small button-like structure that covered the opening of the cervix and that were attached to stems extending into the cervical canal **(Huber et al., 1975)**. They were multipurpose devices that only indirectly acted as contraceptives **(Tatum et al., 1996)**.

In 1902, a pessary that extends into the uterus was developed by *Hollweg* in Germany and used for contraception. This pessary was sold for self- insertion, but the hazard of infection was great, earning the condemnation of the medical community. In 1909, Richter succeeded to introduce a silkworm catgut ring with a nickel and bronze wire protruding through cervical os **(Richter, 1909)**.

Although there is no written record of haw the male partner responded to this metal protrusion at the top of vaginal vault, in 1923 *Pust* combined *Richter's ring* with the old button-type pessary and replace the wire with catgut threads **(Pust, 1923)**.

Given that these devices were used by women during the world ware before antibiotics or non steroidal anti-inflammatory drugs, their use quickly became associated with serious infections and significant patient discomfort. These side effects created such an enduring negative image for IUDs that when *Grafenberg* introduced the first IUD in the 1920s; it was generally rejected by the medical community.

The *Grafenberg ring* was tailless device composed of German silver an alloy of copper, nickel, and zinc. Because of its extreme flexibility, expulsion could easily remain undetected, exposing the user to unwanted pregnancy **(Speroff, and Darney, 2005)**.

Ota in Japan solve the problem; he added a small central disk with three spokes that radiated out to the inner surface of the gold or gold- plated ring to stabilize the device and reduce expulsion rate and he called it **Ota ring (Ota, 1934)**.

Throughout World War II and in the first two decades after World War II an awareness of explosion in population and its impact began to grow. In 1959, reports from Japan and Israel by *Ishihama and Oppenheimer*, respectively, once again stirred interest in the rings. The *Oppenheimer* report was in the American Journal of Obstetrics and Gynecology, and several American gynecologists

were stimulated to use rings of silver or silk and triggered an outpouring of creative new devices by others **(Ishihama, 1959 and Oppenheimer, 1959)**.

In the 1960s and 1970s, the IUD thrived. Techniques were modified and a plethora of types were introduced. The various devices developed in the 1960s were made of plastic (polyethylene) impregnated with barium sulfate so that they would be visible on an x-ray **(Speroff and Darney, 2005)**.

The Margulies coil, developed by Margulies in 1960 at Mt. Sinai Hospital in New York City was the first plastic device with a memory, which allowed the use of an inserter and reconfiguration of the shape when it was expelled into the uterus. The coil was a large device (sure to cause cramping and bleeding), and its hard plastic tail proved risky to the male partner **(Speroff, and Darney, 2005)**.

In 1962, the first international conference on IUDs in New York City at the suggestion of *Alan Guttmacher*. In the conference, Jack *Lippes of Buffalo* presented his experience with his device *(Lippes Loop)*, which fortunately, had single filament thread as a tail. The Margulies coil was rapidly replaced by Lippes Loop, which quickly became the most widely prescribed IUD in united state in 1970s**. (Speroff, and Darney, 2005)**. Many other devices came along, but, with the exception of the four sizes of Lippes Loops and the two Safe-T-Coils, they had limited use. Stainless steel devices incorporating springs were designed to compress for easy insertion, but the movement of these devices allowed them to embed in the uterus, making them too difficult to remove. Majzlin Spring is a memorable example **(Speroff, and Darney, 2005)**.

In 1970, the investigators at Johan Hopkins developed the *Dalkon-Shield* an all plastic device with small plastic protrusions around its edges to help it adhere to the endometrium and reduce the risk of expulsion. Within 3 years, a high incidence of pelvic infection was recognized. The multifilament tail enclosed plastic sheath of the *Dalkon Shield* provided a pathway for bacteria to ascend protected from the barrier of cervical mucus **(Tatum et al., 1975)**.

The greatest risk factor for PID with IUD use was multiple sex partners. When women with one partner who had never used IUD were used as the referent population, women who had one partner who used a copper IUD showed no increased risk for primary tubal infertility. In contrast, women with multiple sexual partners who used IUDs showed an increased risk for tubal infertility **(Cramer et al., 1985)**. Studies conducted in developing countries have found that the incidence of PID is only about 1 case per 1000 insertions **(Skjeldestad et al., 1996 and Walash et al., 1998).** The addition of copper to the IUD was suggested by *Jaime Zipper* of Chile in 1969, whose experiments with metals indicate that copper acted locally on the endometrium **(Zipper et al., 1969)**. *Howard Tatum* combined *Zipper*'s suggestion with the development of the T-shape to diminish the uterine reaction to the structural frame and produced the copper-T. The first copper IUD had copper wire wound around the straight shaft of the T, the TCu-200c it had 200mm2 of exposed copper wire, also known as Tatum-T. **(Tatum, 1983)**. Tatum's reasoning was that the T-shape would conform to the shape of the uterus in contrast to