INTRODUCTION

Recurrent miscarriage is defined as at least two or three sequential abortions before the 20th week of gestation. RPL occurs in 1% to 5% of all pregnancies. Despite the fact that several factors such as environmental and stress factors, chromosomal abnormalities, coagulation protein defects and, endocrine, anatomical and autoimmune disorders are involved in approximately 60% of RPLs, in the remaining 40% of the cases, the etiology of abortion is unknown and is classified as unexplained RPL (URPL) ***(Gharesi-Fard et al., 2014).***

Fifty percent of recurrent miscarriage are due to anatomical, immunological, genetics, endocrine, thromb-ophilic and environmental factors. However, in 50% of the cases, the cause of abortion is unknown or idiopathic ***(Shakarami et al., 2015).***

Recurrent miscarriage is very hazard a significant health problem, affecting 5% females of reproductive age. Women at reproductive age face significant economical, emotional and social problems due to RPL ***(Kashif et al., 2015).***

There are 95% of clinically lost embryos in RPL patients have a normal karyotype and a significant proportion of these abortions are associated with immune etiologies. In fact, a great number of immunological imbalances has been documented in which development of fetus and placenta is affected by

maternal autoantibodies or autoreactive cells leading to infertility or RPL ***(Zarnani, 2015).***

Clinically recurrent loss of gestations is occurring in approximately 15-25% of pregnancies. The majority of sporadic losses before 10 week's gestation result from random numeric chromosome errors, specifically, trisomy, monosomy, and polyploidy ***(Lund et al., 2012).***

About 5% of women have congenital uterine anomalies. The rate is lower in the general population, higher among infertile women, and the highest in women with recurrent pregnancy losses (10%) ***(Venetis et al., 2014).***

Women with unexplained recurrent loss of gestation of unexplained causes of miscarriage have an excellent prognosis for future pregnancy outcome without pharmacological intervention if offered supportive care alone in the setting of a dedicated early pregnancy assessment unit ***(RCOG, 2014).***

Hysteroscopy is wonderful method for the evaluation of uterine cavity. It is a dynamic test and allows a direct visualization of the endometrium, revealing the nature, location, shape, size and vascular pattern of any uterine cavity abnormalities ***(Elbareg et al., 2015).***

Hysteroscopy would be done after abnormal hysterosalpingogram or the primary means of checking for uterine issues that may be causing recurrent miscarriage ***(Danielsson, 2016).***

AIM OF THE WORK

To assess the hysteroscpic value in the management of intrauterine lesion in women with recurrent pregnancy loss.

Research Hypothesis

In women with history of recurrent pregnancy loss hysteroscopy may have a role in the management of this problem.

Research Question:

In women with recurrent pregnancy loss, does hysteroscopy have a role in the management of this problem?

HYSTEROSCOPY

Hysteroscopy is the assessment of cervical canal and uterine cavity by direct endoscpic visualization ***(Guida et al., 2006).***

For more than one hundred years, investigators all-over the world have been trying to develop techniques by which the visualization of the uterine cavity would be possible. Before the advent of hysteroscopy, gynecologists could investigate the uterine cavity only indirectly ***(Valla, 1999 and Serden, 2000).***

Between the end of 1970s and the beginning of the 1980s, the modern hysteroscopy beginning was reported by various authors. For the next 10 years or more the cervix and the uterine cavity were examine using a diagnostic hysteroscope with a total diameter of 5mm,consisting of a4mm rod lens system scope inserted in simple sheath necessary to guide the distention media(CO2)into the uterine cavity ***(Valle, 1983).***

At the beginning of the 1990s, new scopes were introduced with a diameter ranging between 1.2 and 3 mm and operative sheaths with a diameter equal to or less than 5mm (corresponding to the final diameter of the classic diagnostic hysteroscope). This allowed the physician to adopt an operative scope with equipped with mechanical instruments even ***(Bettocchi et al., 2003).***

In a short time, after acquiring some experience in handling an operative hysteroscope equipped with miniaturized

instruments, physicians can perform targeted hysteroscopic biopsies (THB) and treat benign intrauterine pathologies, such as polyps and synechiae, without any premedication or anesthesioa. This procedure has been defined as see and treat in this situation there is no longer a distinction between diagnostic and operative procedure, because a single procedure is performed in which the operative part is perfectly integrated in the diagnostic work-up ***(Bettocchi et al., 2003).***

One of the latest hysteroscopes is the Office continuous flow operative hysteroscope"size5" (karl storz, tittlingen, Germany), based on a 2.9mm rod lens system, with an outer diameter corresponding to 5mm. Recently, a thinner version has been developed based on a revolutionary 2mm rod lens system scope that reduces the final diameter of the hysteroscope to 4mm. Both instruments features two sheaths (one for irrigation and another for suction); and operative 5F catheter canal (approximately 1.6mm); and are oval in shape, ideal for a traumatic insertion of the scope into the cervix. Distention of the uterus is obtained using an electronic suction-irrigation pump that can maintain a constant intrauterine pressure around 30 to 40 mmhg, avoiding over distention of the muscle fibers and patient discomfort. A variety of 5Fcatheter mechanical Instruments and 5f catheter bipolar electrodes are now available ***(Bettocchi et al., 2003).***

Types of hysteroscope:

1. The contact hysteroscope:

The contact hysteroscope is a rigid endoscope which does not give the panoramic view of conventional hysteroscopes; however, there are a number of advantages in the use of this simple optical instrument for direct viewing of the uterine canal and cavity ***(Gardner, 1983).***

Major advantages of contact hysteroscope include no need for special light source, excellent visualization even in the presence of bleeding, and no need for the use of distending media major disadvantages of the contact hysteroscope include lack of panoramic view, which increase the chance that a lesion may be missed, and inability to operate through the scope ***(Smith et al., 1997).***

Because of the rigid glass guide, there is no distortion from transmitted images; which can be magnified 1.6 times without the need for special lenses ***(Smith et al., 1997).***

2. Panoramic hysteroscope:

A. Rigid Hysteroscope:

It consists of a shaft of fiberglass bundle that conducts light along a system of lenses. Fixed-focused instruments are focused at infinity, and therefore, the image is smaller than the

actual size when it is positioned away from the object; a meaningful view is obtained when moved closer to the object.

These models offer panoramic viewing, as well as close-up viewing. The gynecologist should check the focusing mechanism on the hysteroscope before inserting it into the endocervical canal to gain perspective ***(Sielger et al., 1990).***

B. Flexible Hysteroscope:

Flexible diagnostic hysteroscopes, usually 3.5mm in outer diameter, are excellent alternatives for diagnosis. In addition to their distal steerability, they have an additional feature that allows the tip to be bent according to need. This can be helpful in markedly anteflexed or retroflexed uteri in guiding the instrument a traumatically towards the uterine cavity. With these flexible diagnostic hysteroscopes eitherCO_2 gas or low viscosity fluids can be used as distending media ***(Valle, 1998).***

C. Micro-hysteroscope:

The micro-hysteroscope offers a combination of panoramic, contact hysteroscopy and microscopy ***(Hamou, 1983)*** micro-hysteroscope has the capability of magnification twenty fold for a panoramic view, or to x60 or x50 for a contact view. The latter magnification can evaluate tissues at the nucleocytoplasmic level. The instrument can also be used for evaluation of the ectocervix on contact ***(Valle, 1998).***

Office Hysteroscopy

In the last few years there has been a growing interest in performing hysteroscopy as an office procedure. In order to be successful, it should be fast easy to perform, with no excessive manipulation. With few exceptions, office hysteroscopy include patients preference, no special preoperative examinations needed and no requirement for general anaesthesia. The procedure takes several minutes with minimal amount of discomfort and patient can observe the procedure by viewing the video-monitor. From the surgeons point of view, this office procedure eliminates the nuisance of scheduling the patient in the operating room ***(Siegler, 1995).***

Advantages and disadvantages of office hysteroscopy:

Hysteroscopy is generally accepted as the gold standard in diagnosis and more importantly, allows for treatment of pathology at the same time. Practitioners may be reluctant to perform hysteroscopy as an initial test without a high degree of suspicion for pathology because it has traditionally required anesthesia in an operating room setting. The advent of smaller diameter instruments makes office-based operative hysteroscopy an ideal first line procedure and can efficiently treat infertile patients with uterine abnormalities in the same setting, thus facilitating a rapid transitions from diagnosis to treatment and subsequent pregnancy ***(Mary et al., 2004).***

Notwithstanding, the international literature suggests that outpatient hysteroscopy without any form of analgesia or anesthesia is a well-tolerated procedure with a high success rate ***(Yang and Vollenhoven, 2002).*** In general, it continues to be considered an invasive and painful technique by most gynaecologists and patients indeed, pain experienced during the procedure continues to represent the most common reason for failure, and this can occur even if local anaesthesia is used ***(Sharma et al., 2005).***

The advantages of outpatient hysteroscopy for the woman are the avoidance of a general anaesthetic, a more rapid assessment (especially if it is part of a one-stop assessment clinic), and less likelihood of cancellation. The environment may be less threatening than a conventional operating room and the woman has direct involvement in the procedure, with immediate feedback and faster recovery ***(Kremer et al., 2000).***

In the recent years, a semi-rigid 3.5mm fibre-opptic minihystereoscope (Vrsascope, Gynecare, Ethicon) has been reported. However, the flat tip of the scope and the standard 0 angle of vision may interfere with cervical penetration and cavity exploration ***(Cicinelli, 2005).***

Thus, pain continues to represent the main limiting factor to a large-scale use of office hysteroscopy ***(Campo et al., 2005).*** To minimize patients discomfort and maximize the chance of success of the procedure and its wide spread use, a

new technique based on the employment of small-diameter rigid and flexible hysteroscopes and an atraumatic insertion technique (vaginoscopic approach) has been developed. This technique has permitted complete elimination of any kind of premedication analgesia or anaesthesia, making the procedure faster and complication free ***(Cicinelli, 2005).***

For the medical staff there is the benefit of scheduling procedures in a dedicated clinic that provides excellent diagnostic efficacy and the possibility of treatment at the same time. Fewer staff are required than for the traditional theatre setup and there may be long –term cost savings. The procedure is accurate for the diagnosis of serious endometrial disease (ie., cancer and hyperplasia)in women with abnormal uterine bleeding. Outpatient hysteroscopy is as accurate as traditional inpatient hysteroscopy ***(Clerk et al., 2002).***

Office-based operative hysteroscopy has also been found to be extremely safe. According to ***Mary et al. (2004),*** no complications occurred, and no patient needed extended monitoring or laboratory studies for fluid over load. Typical complications associated with hysteroscopy may be procedure-related, media-related, or post procedure related.

Procedure-related complications, such as uterine perforation, cervical laceration, and damage to tissues including bowel bladder, and vagina, can be minimized by performing an ultrasound prior to the procedure, revealing the subtle tortuosity

and dimensions of the cervical and endometrial canal. Asking the patient to have a full bladder also helps to straighten the cervico-uterine canal to facilitate entry in patient with a difficult entry; concurrent ultra sound guidance can be invaluable ***(Mary et al., 2004).***

Takahashi et al. (2000) has also suggested that irrigation of the cavity with saline may have a beneficial effect on implantation and pregnancy rates patients with tubal or uterine causes of infertility.

Using saline as the distention medium also serves to minimize (and often to eliminate) medium-related complications. Hyponatremia and cerebral edema are more of a concern when using hypotonic, electrolyte- free media, such as glycine or sorbitol. But as several authors point out, fluid over load, pulmonary edema and congestive heart failure can still occur if an excessive volume of saline is used, especially if patients have under lying medical conditions predisposing to fluid- related complications. Air embolism is also a potential complication that must be considered. Avoiding the trendelenburg position, excessive fluid pressure, prolonged operative time, a dilated cervix without instruments sealing air entry, and by purging the tubing of air, the risk of embolism is minimal ***(Bradley, 2002).***

Post-procedure complications like endometritis can be reduced or eliminated by pre- and post –treatment with

antibiotics, and by avoiding operation in patients with active vaginal infections ***(Mary et al., 2004)***.

Patient discomfort and pain levels are higher than with general anaesthesia, but generally the procedure is well tolerated. Operating times are limited to 15-20 minutes because of these factors. A large meta-analysis has demonstrated a failure rate for diagnostic procedures of 4.2% for outpatient hysteroscopy compared with 3.4% for inpatient procedures ***(Pashopoulos et al., 1997).***

Patient selection for office hysteroscopy:

Appropriate patient selection is critical to success of outpatient hysteroscopy. A detailed medical and gynaecological history should be taken. Women with menstrual disorders or post – menopausal bleeding should have a transvaginal ultrasound scan to assess the endometrial thickness. Saline instillation sonography involves scanning while introducing 10-20ml of saline directly into the uterine cavity via a fine plastic tube. This technique is a good revealing intrauterine polyps and submucous fibroids. In the practice, hysteroscopy is needed when there is evidence of an ultrasound abnormality or persistent symptoms. Some women will be unable to tolerate the hysteroscopy unless there is evidence of an ultra sound abnormality or persistent symptoms. Some women will be unable to tolerate the hysteroscopy or find it too painful. If an operative procedure requires prolonged intrauterine surgery to

remove pathology it is more appropriate to use a general anaesthetic ***(RCOG, 1998).***

Patient selection criteria for outpatient diagnostic hysteroscopy:

- Full patient counseling and consent.
- Negative pregnancy test if premenopausal.

Additional selection criteria for outpatient operative hysteroscopy are:

- Women tolerated diagnostic hysteroscopy well.
- Women not actively bleeding.
- Malignancy not suspected.
- Focal pathology less than 4 cm diameter.
- Small pedunculated polyps / fibroids easier to remove than large sessile polyps/ fibroids.
- Sidewall polyps/fibroids easier to remove than fundal lesions.
- Procedure feasible to complete within 20 minutes.

(RCOG, 1998)

Equipment:

Hysteroscopes:

Modern office hysteroscopes range in diameter from 2 mm to 4mm most operators use a rigid rod lens system. A cold light cable modern hysteroscopes provide a60-90 degree outer field of view. This view is wider in gaseous than liquid media because of the lower refractive index. If the outer lens may be offset to the axis of the telescope at various angles up to 30 degrees, providing a significantly expanded field of view when the lens is rotated. For operative procedures a 0-10 degree hysteroscope is preferable as this will keep the instruments in view. Customarily, the direction of the angle of view is always opposite the axis of the light cable connector. The hysteroscopic sheath sits over a matched hysteroscope. Simple diagnostic sheaths usually have one port for distension media. The continuous flow sheath has two separate channels fitted with stop cocks that serve independently to instill and remove distension media. The inner sheath carries the distension medium to the uterine cavity and fitted outer sheath evaluates this medium by gravity or suction. A third channel allows the operative instruments ***(Mencaglia and Hamout, 2002).***

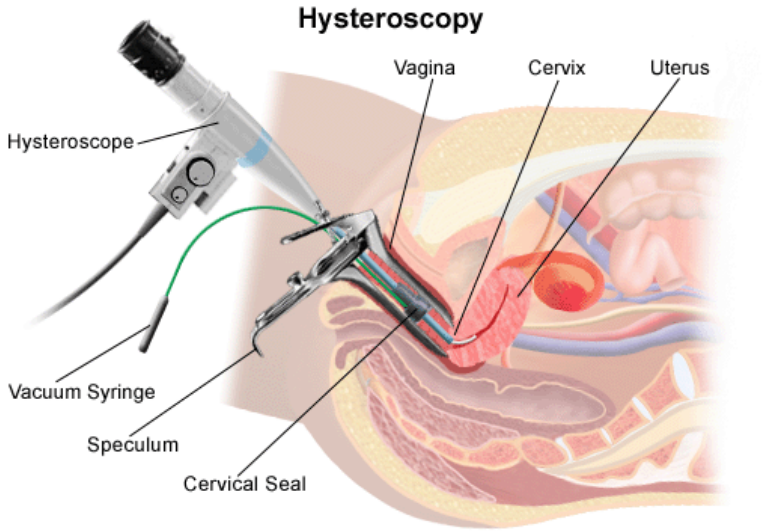

Figure (1): Hysterosocpy diagram.

Flexible hysteroscopes use a fibre optic cable bundle to transmit the image. They are expensive and cannot to be autoclaved. They allow good visualization and are suitable for diagnostic procedures or direct biopsy but cannot easily be used for operative procedures. They have been shown to cause slightly less pain but have a lower procedural success rate and longer operating time when compared with rigid hysteroscopes ***(Clark et al., 2002).***

The versa scope (Gynecare, edinburgh, UK) semirigid hysteroscope with an outer diameter of 1.8mm the optical system uses a set of 50000 fused optical fibres. The observed image is the product of an array of individual optical fibers. A Flexible disposable outer sheath gives the end of the hysteroscope a ten – degree tilt and provides an inflow channel