ASSESSMENT OF THE PREVALENCE OF ABNORMAL HYSTEROSCOPIC FINDINGS IN INFERTILE WOMEN UNDERGOING ART

Thesis

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By

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Contents

List of Abbreviations

Abb.	Full term
AFS	American Fertility Society
ART	Assissted reproductive techniques
CE	Chronic endometritis
CPR	Clinical pregnancy rate
CUA	Congenital uterine anomalies
ESHRE	European Society of Human Reproduction and Embryology
HM	Hysteroscopic morcellator
HOX	Homeobox protein
IUA	Intra uterine adhesions
LBR	Live Birth rate
MDAs	Mullerian duct anomalies
OH	Office hysteroscopy
RIF	Recurrent implantation failure
RPL	Recurrent pregnancy loss

List of Tables

List of Figures

Abstract

Background: The endometrium plays an important role in implantation of good quality embryos in ART. Many studies have proved the negative impact of intra uterine pathologies on reproductive outcome whether spontaneous pregnancy or ART, because uterine anomalies may be associated with many obstetric complications such as miscarriage, preterm birth, premature rupture of membrane, malpresentation, postpartum bleeding and retained placenta. Aim of the Work: This study aims to assess the prevalence of abnormal hysteroscopic findings among infertile women undergoing ART at Ain Shams Maternity University Hospital over the period from January 2007 to January 2017. **Aim of the Work:** to assess the prevalence of abnormal hysteroscopic findings among infertile women undergoing ART at Ain Shams Maternity University Hospital over the period from January 2007 to January 2017. **Patients and Methods:** This descriptive retrospective study was carried out on infertile couples planned for ART who were sent to ECDU for hysteroscopy in Early Cancer Detection Unit (ECDU), Ain Shams University Maternity Hospital. Case reports From January 2007 to January 2017 were reviewed. **Results:** The most prevalent abnormality was endometrial polyp (18.4%) followed by uterine septum (6.9%). **Conclusion:** This study concluded that the most common uterine abnormality was endometrial polyp (18.4%), followed by uterine septum in 6.9% of patients. Also, thick endometrium was very common with a prevalence of 12.9%. Therefore, based on this high prevalence of abnormalities, this study is not in agreement of the opinion that all women should be offered hysteroscopy, even if they have normal vaginal ultrasound and hysterosalpingography, though this is supposed to increase the detection rate of minor abnormalities, which theoretically will improve the reproductive outcome. Still, further interventional randomised controlled trials (RCT) are needed to verify the positive impact of routine use of hysteroscopy prior to ART.

Key words: abnormal hysteroscopy, infertility, ART

Introduction

The mean prevalence of Mullerian duct anomalies was estimated to be about 7% in the general population **(Saravelos *et al*., 2008)** and 13.3% in the infertile population **(Jayaprakasan *et al.*, 2011).**

The female genital tract is derived from paramesonephric duct (Mullerian) by the lateral fusion of the 2 paired mullerian ducts which unite to form the uterus and upper part of cervix. Septal absorption by apoptosis results in a single cavity **(Dreisler, 2014).**

Normal development of the female genital tract involves a series of events: mullerian duct elongation, fusion, canalization, and septal resorption **(Rachow and Arici, 2007),** therefore, congenital uterine anomalies result from abnormal formation, fusion or resorption of the mullerian ducts during fetal life **(Moore *et al.*, 2008*).***

Because of the role of the wolffian (mesonephric) ducts in the development of the female reproductive tract and the renal development, the abnormalities originating from the mesonephric maldevelopment are associated with mullerian duct anomalies **(Hannema and Hughes, 2007)**.

Renal anomalies are frequently associated with mullerian duct anomalies with a prevalence of (20-30%) such as pelvic kidney, renal agenesis, duplication of the collecting system and ectopic ureters, hypoplasia, malrotation **(Lin *et al.*, 2002; Chandler *et al.*, 2009).**

Uterine cavity and its innermost layer; the endometrium play an important role in implantation of the blastocyst **(Taylor, 2008).**

Also, many experimental and clinical studies have emphasized the importance of uterus and intrauterine pathology for spontaneous and post-ART fertility **(Gulliano *et al.*, 2015),** which makes evaluation of the uterine cavity a basic step in investigation of the infertile women **(Collins and Crosignani, 1992).**

Office hysteroscopy (OH) is increasingly recommended by many studies as a routine procedure in the infertility work up **(Oliveira *et al.*, 2003; Doldi *et al.*, 2005; Lorusso *et al.*, 2008)** because office hysteroscopy has the advantages of faster ambulation, enhanced cost effectiveness and reduced anesthesiological risks **(Bettocchi *et al.*, 2003)** and minimal morbidity **(Marana *et al.*, 2001).**

Also, correction of most of these abnormalities and restoration of a normal uterine cavity is possible during OH with reported good outcome, similar to that achieved in patients with a normal hysteroscopy **(Grimbizis *et al.*, 2001; Oliveira *et al.*, 2003; Ozgur *et al.*, 2007).**

Despite the great advances in the assisted reproduction technologies, the delivery rate per oocyte retrieval was only 25% for ICSI and 27.41% for IVF **(Hochchild *et al.*, 2017).**

The prevalence of minor unsuspected intra uterine pathology was reported to be as high as 20-40% **(Koskas *et al.*, 2010).**

There is evidence that performing hysteroscopy before IVF can increase the chance of pregnancy in women who had one or more failed IVF cycles **(El-Toukhy *et al.*, 2008; Bosteels *et al.*, 2010).**

This can be explained by its ability to treat uterine abnormalities and therefore restoring the normality of the uterine cavity **(Taylor 2008, Sugihara *et al.*, 2010).**

In addition to this, many studies have postulated many benefits that extend beyond treatment of intrauterine abnormalities such as:

First, irrigation of the cavity with saline since it mechanically removes harmful anti-adhesive glycoprotein molecules on the endometrial surface involved in endometrial receptivity [i.e. cyclooxygenase-2 (COX-2), mucin-l (MUC-l) and integrin aVb3] **(Takahashi *et al.*, 2000).**

Secondly, the hysteroscopic diagnostic act itself may allow easier embryo transfer through studying the course and morphology of the cervical canal **(El Mazny *et al.*, 2011).**

Also, many authors have condluded that mechanical manipulation of the endometrium may enhance receptivity by modulating the expression of gene encoding factors required for implantation, as glycodelin *A* **(Mirkin *et al.*, 2005)** laminin alpha-4, integrin alpha-6 and matrix metalloproteinase-l **(Almog *et al.*, 2010).**

On the other hand, many studies showed that there was no difference in the live birth rate (LBR) and clinical pregnancy rate (CPR) (**Yu *et al.*, 2012; El-Toukhy *et al.*, 2014).**

Also, many studies did not recommend hysteroscopy as a routine before ART, claiming that the significance of treating unsuspected intra uterine pathologies are not yet fully proven (**ESHRE, 2000; RCOG 2004).**

In addition, The routine role of hysteroscopy has been questioned due to its invasiveness, and that it can not evaluate the external contour of the uterine cavity, which means that it will not be very well reliable in diagnosis and differentiation between septate and bicornaute uterus **(Bieber and Derian, 2008).**

Aim of the Work

This study aims to assess the prevalence of abnormal hysteroscopic findings among infertile women undergoing ART at Ain Shams Maternity University Hospital over the period from January 2007 to January 2017.

Chapter (1)

Mullerian Duct Anomalies (MDA)

Fusion of the mullerian ducts normally occurs between the 6^{th} and 11^{th} weeks of gestation to form the uterus, fallopian tubes, cervix, and proximal two-thirds of the vagina **(Troiano *et al.*, 2004).**

Any disruption of the mullerian duct development during embryogenesis can result in a broad and complex spectrum of congenital abnormalities termed mullerian duct anomalies (MDAs).

Clinical presentations of mullerian anomalies include: cyclic or non cyclic pelvic pain, dysmenorrhea and endometriosis which may contribute to infertility **(Lin *et al.*, 2002; Fedele *et al.*, 2006).**

The ovaries and distal third of the vagina originate from the primitive yolk sac and the sinovaginal bud, respectively. Therefore MDAs are not associated with anomalies of external genitalia **(Behr *et al.*, 2012).**

Also, gonadal development is a separate process, thus women with mullerian duct anomalies commonly have