e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(8); 744-748

Original Research Article

Radiological Observation of Congenital Uterine Anomalies and Their Impact on Fertility

Madhu Kumari[1], Kumari Suman[2], Priyamvada[3], Birendra Kumar Sinha[4]

[1]Tutor, Department of Anatomy, PMCH, Patna
[2]Tutor, Department of Anatomy, PMCH, Patna
[3]Junior Resident, Department of Anatomy, PMCH, Patna
[4]Associate Professor, Department of Anatomy, PMCH, Patna

Received: 10-06-2023 / Revised: 16-07-2023 / Accepted: 09-08-2023
Corresponding author: Kumari Suman
Conflict of interest: Nil

Abstract:

Background and Objectives: Uterus is responsible for most of the vital steps in process of reproduction like sperm migration embryo implantation, fetal nourishment, development growth and birth of baby. Congenital uterine anomalies affect some or all of these uterine functions required for successful pregnancy. Observation of congenital uterine anomalies and their on fertility.

Material and Methods: It is a descriptive observational study. The study was conducted in out Patient department of Obstetrics and Gynecology, Patna medical college, Bihar. On patients come for cyclical pian abdomen, lump in abdomen, menstrual problem, problem in conception, recurrent miscarriage, antenatal postnatal complication and diagnosed to have reproductive system abnormalities in aforesaid institution were selected as study population. These patients usually come from Patna as well as all districts of Bihar.

Conclusion: The of fertility concern and reproductive system anomalies is of great concern with the advent of newer and sophisticated diagnostic tools and increased patient awareness. Every gynaecologist and obstetrician should have adequate knowledge about occurrence corrective treatment to increase fertility outcome, possible complication in such pregnancies and their proper management to successfully save the lives of mother and fetus.

Keywords: Fertility, Pregnancy, Miscarriage.

Introduction

Uterus is responsible for most of the vital steps in process of reproduction like sperm migration embryo implantation, fetal nourishment, development growth and birth of baby [1]. Congenital uterine anomalies affect some or all of these uterine functions required for successful pregnancy. Congenital uterine anomalies occur because of abnormal formation, fusion or resorption of mullerian ducts during fetal life [2]. These anomalies have strong relation with increased rate of miscarriage, preterm delivery and other adverse fetal and maternal outcome. (Green and Harris 1976, Rock and Schaff 1985, Acien 1993, Raga et al 1997, Grimbizis at al 2001, Tomazeuic et al 2007). The most commonly reported congenital uterine anomalies are septate, arcuate, didelphys, unicornuate or hypoplastic uteri, congenital uterine anomalies are frequently associated with increased risk of first and second trimester miscarriage and preterm delivery [3]. The prognosis of successful outcome of pregnancy in patients with mullerian anomalies are associated with type of malformation with asymmetric fusion defects carrying worst prognosis and septate, bicornuate and didelphic uteri carrying increasingly better pregnancy outcome. Some uterine anomalies are diagnosed when patient comes with problem in onset of menstruation, some during routine pelvic examination, some in patient coming with complain of recurrent miscarriage, others during cesarean delivery or during manual exploration [4]. The actual incidence and prevalence of mullerian anomalies in the general population are unknown. In women with infertility problems the incidence of mullerian duct anomalies is as slightly higher at 3-6%. As many as 24% of women with recurrent miscarriage many have uterine anomalies which is approximately 4 times more than that of low-risk women, where prevalence is in order of 5-6%. In terms of types of anomalies similar distribution are seen in different groups, having arcuate uterus being most common, followed by septate then bicornuate then more complex anomalies such as uterus didelphys and single uterine horn being least prevalent. A compromised blood supply interfering with normal implantation and placentation and reduced size of uterine cavity are often thought to be possible cause but this reason seems unlikely or insubstantial in view of arcuate uterus [5]. MRI is considered highly accurate in diagnosing congenital uterine anomalies and is considered gold standard imaging technique. As 3D-

US is non-invasive, reproducible and low-cost technique and having additional advantage that it can catch third or coronal plane, which provide clear front view of uterus and complete anatomical details [6]. So, 3D-US should be alternative of MRI. In this study all patients coming with problem of menstruation, recurrent miscarriage, problem of conception, and bad obstetric history are evaluated, and results are assessed on the basis of outcome of pregnancy in antenatal, intranatal or postnatal period and their relative frequencies [7].

Objectives

The malformation of mullerian duct range from uterine or vaginal agenesis to duplication of uterus and vagina to minor uterine cavity abnormalities. Congenital uterine abnormalities may be associated with abnormalities of renal and axial skeletal systems. Most mullerian duct anomalies are associated with functioning ovaries and age appropriate external genitilia. These are recognized after onset of puberty, in prepubertal period normal external genitilia and age-appropriate developmental milestone often hide abnormalities of internal reproductive organs.

Material and Methods

It is a descriptive observational study. The study was conducted in outpatient department of Obstetrics and Gynecology, Patna medical college, Bihar. Total 50 patients were studied.

Study period: Oct 2018 to Dec, 2020, On patients come for cyclical pian abdomen, lump in abdomen, menstrual problem, problem in conception, recurrent miscarriage, antenatal postnatal complication and diagnosed to have reproductive system abnormalities in aforesaid institution were selected as study population. These patients usually come from Patna as well as all districts of Bihar. Patients detected to have congenital uterine anomalies after puberty and before conception in antenatal period by HSG, USG, hysteroscopy, laparoscopy or MRI were included in this study.

Exclusion criteria

Patients having the following criteria were excluded:

Patients with acquired reproductive system abnormalities.

Patients with general medical disorders like chronic anaemic condition, thyroid disorders, essential hypertension, pregnancy diabetes, asthma, tuberculosis, TORCH infection etc.

- Report of routine blood investigations
- Hyterosalpingiography –Using Radio-opaque dye, cannula, x- ray machine.
- 2-D or 3-D ultrasonography transvaginal was done on USG machine Toshiba model (XARIO) using TVS probe 6MHZ covered with sonogel, cotton swab.
- Transabdominal sonography with colour Doppler study –It was done on USG machine Toshiba model (XARIO0 usine TAS curvilinear probe (3.5 MHZ) covered with sonogel and cotton swab to mob the examined area.
- Magnetic resonance imaging using refurbished MRI scanner in multiple sagital planes, coronal and axial in T1T2 sequence with or without fat saturation on 1.5 T unit and a 4- channel torso phased-array coil.
- Hysteroscopy and laparoscopy – Using catheter, needle, carbon dioxide, scalpel. Blade, cotton, spirit then laparoscope camera and TV.

From all selected patients detailed history was taken followed by general examination, all routine as well as radiological investigations which patients have undergone were studied in details. These patients were advised to be on regular follow up and to undergo frequent antenatal check –up so fertility as well as feto-maternal outcome can be assessed. After that result were tabulated and evaluated with relevant statistical analysis.

Analysis of data

Results regarding maternal reproduction outcome with reproductive system abnormalities were noted. Collected data was tabulated and analysed by Microsoft Excel and statistical version 6 and GraphPad prism version 4 software. Kruskal wallis ANOVA, Fischers probability test with Freemon- Halten extension and chi-square test were used for relevant statistical analysis.

Results

Table 1: Distribution of patients according to the type of Congenital uterine anomaly (n=50)

Type of Anomaly	No. of patients of each type ofanomaly.
Septate uterus	20 (40%)
Bicornuate uterus	12 (24%)
Unicornuate uterus	6 (12%)
Didelphic uterus	6 (12%)
Arcuate uterus	3 (6%)
Transverse vaginal septum	1 (2%)
Mayer- Rokitansky Kustner – hauser syndrome	2 (4%)

Table 2: Distribution of patients according to age (in years).

Type of Uterovaginalanomalies	Age (in years)		
	< 20 yrs	20-30 yrs	> 30 yrs
Septate uterus (n=20)	2 (10%)	3 (15%)	15 (75%)
Bicornuate uterus (n=12)	1 (8.3%)	3 (25%)	8 (66.6%)
Unicornuate uterus (n=6)	1 (16.7%)	2 (33.3%)	3 (50%)
Didelphic uterus (n=6)	0 (0%)	2 (33.3%)	4 (66.7%)
Arcuate uterus (n=3)	0 (0%)	1 (33.3%)	2 (66.6%)
Transverse vaginal septum (n=1)	0 (0%)	1 (100%)	0 (0%)
MRKH (n=2)	1 (50%)	1 (50%)	0 (0%)

Table 3: Distribution of patients on the basis of marital status

Type of Uterovaginal anomalies	Married	Unmarried
Septate uterus (n=20)	17 (85%)	3 (15%)
Bicornuate uterus (n=12)	11 (91.7%)	1 (8.3%)
Unicornuate uterus (n=6)	5 (83.3%)	1 (16.6%)
Didelphic uterus (n=6)	6 (100%)	0 (0%)
Arcuate uterus (n=3)	3 (100%)	0 (0%)
Transverse vaginal septum (n=1)	0 (0%)	1 (100%)
MRKH (n=2)	0 (0%)	2 (100%)

Table 4: Distribution of patients according to history of infertility

Type of Uterovaginalanomalies	Previous history of infertility	
	Present	Absent
Septate uterus (n=20)	4 (20%)	16 (80%)
Bicornuate uterus (n=12)	1 (8.3%)	11 (91.7%)
Unicornuate uterus (n=6)	1 (16.7%)	5 (83.3%)
Didelphic uterus (n=6)	1 (16.7%)	5 (83.3%)
Arcuate uterus (n=3)	0 (0%)	3 (100%)
Transverse vaginal septum (n=1)	1 (100%)	0 (0%)
MRKH (n=2)	2 (100%)	0 (0%)

In my study previous history of infertility were present in all patients of MRKH (100%) and TVS (100%).

Table 5: Distribution of patients according to gravida.

Uterovaginalanomalies	Primigravida	Multigravida
Septate uterus (n=16)	4 (25%)	12 (75%)
Bicornuate uterus (n=11)	5 (45.5%)	6 (54.5%)
Unicornuate uterus (n=5)	3 (60%)	2 (40%)
Didelphic uterus (n=6)	3 (50%)	3 (50%)
Arcuate uterus (n=3)	1 (33.3%)	2 (66.7%)
Transverse vaginal septum (n=1)	0 (0%)	0 (0%)
MRKH (n=2)	0 (0%)	0 (0%)

In my study maximum patients were multigravida. In septate uterus (75%) and arcuate uterus (66.7%).

Table 6: Distribution of patients according to antenatal complications in the present pregnancy.

Antenatal Complications	Type of Uterovaginal Anomalies				
	Septate (n=2)	Bicornuate (n=6)	Unicornuate (n=2)	Didelphic (n=3)	Arcuate (n=2)
Anemia	8 (50%)	6 (34.5%)	5 (100%)	3 (50%)	3 (100%)
Pregnancy induced HTN	2 (12.5%)	1 (9%)	0 (0%)	1 (16.7%)	1 (33.3%)
Miscarriage	4 (25%)	5 (45.4%)	1 (20%)	2 (33.3%)	0 (0%)
Antepartum haemorrhage	2 (12.5%)	1 (9%)	3 (60%)	2 (33.3%)	0 (0%)
Malpresentation	10 (62.5%)	3 (27.3%)	2 (40%)	3 (50%)	2 (66.7%)
Intrauterine growth restriction	6 (37.5%)	2 (18.2%)	2 (90%)	2 (33.3%)	3 (100%)
Intrauterine fetal death	3 (18.7%)	1 (9%)	1 (20%)	0 (0%)	0 (0%)
Preterm prelabour rupture of membrane	4 (25%)	2 (18.2%)	2 (40%)	2 (33.3%)	1 (33.3%)
term prelabour rupture of membranes	1 (6.25%)	0 (0%)	0 (0%)	1 (16.7%)	1 (33.3%)

In my study anemia was one of the common antenatal complications in all type of congenital anomalies, septate (50%), bicornuate (34.5%), unicornuate (100%), didelphic (50%), arcuate (100%), Antenatal complications were very common in most of the patients of all types of congenital uterine anomalies.

Discussion

Mullerian duct anomalies present in adolescent girl with menstrual abnormalities or pain or during childbearing age with fertility concerns and present with pregnancy complicated with recurrent miscarriage, preterm LUCS, malpresentation, intrauterine growth restriction, preterm prelabour rupture of membrane. In our study mullerian duct anomalies encountered were classified into 7 broad categories [8]. Their individual occurrence, relative frequencies, past history of infertility, past obstetric history in multigravida, mode of detection of uterovaginal anomaly and any antenatal complication in present pregnancy were tabulated and analysed. Mullerian duct anomalies are divided into various group on the basis of agenesis or hypoplasia of mullerian ducts, disorders of vertical fusion of the mullerian ducts, disorders o lateral fusion of mullerian ducts and unusual configurations of vertical lateral fusion defects of mullerian ducts [9]. Out of 50 patitents in study 20 (40%) having septate uterus, 12(24%) bicornuate uterus, 6 (12%) unicornuate uterus, 6 (12%) didelphic uterus, 3 (6%) arcuate uterus, 1 (2%) transverse vaginal septum, 2 (4%) Mayor Rokitansky Kuster Hauser syndrome. Maximum patients of uterovaginal dysgenesis are of age group >30 yrs due to late diagnosis because of delayed childbearing age tendency and women undergoing treatment for infrtility. But females of MRKH syndrome report in adolescent because of major problem in menarche, so 1(50%) of these are of <20 yrs of age and 1(50%) of 20-30 yrs pf age. S most of the part of vagina, whole of cervix and uterus is not developed so there is problem on onset of menstruation due to lack of endometrium [10]. Most of the patients of category of mullerian duct anomalies which arises from mullerian duct dysgenesis are married 17(85%) of septate, 11 (91.7%) of biornuate, 5 (83.3%) of unicornuate, 6 (100%) of didelphic and 3 (100%) of arcuate uteri due to reporting for problem of infertility, recurrent miscarriage and problem like preterm labour. But patient related to mullerian duct agenesis MRKH are unmarried as delayed menarchae is concern. In septate 4 (20%), 1 (8.3%) bicornuate, unicornuate uterus 1 (16.7%), didelphic uterus 1 (16.7%) having problem of infertility only, major of them are fertile and obstetric problems are main issue, whereas in patient of mullerian agenesis (MRKH), 2(100%) and transverse vaginal septum 1(100%) infertility is the main issue. In our study more multigravida patients are in septate (75%), arcuate (66.7%) and bicornuate (54.5%) and almost equal primigravida and multigravida in didelphic uteri. But there is more no of primigravida in unicornuate uterus (60%). Anaemia is the most common occurrence in developing countries so 50 % septate, 54.5% bicornuate, 100% unicornuate, 50% didelphic, 100% arcuate uteri [11]. Patients having anaemia, miscarriage is also one of the most common complications in uterovaginal anomaly patients (25%) septate, (45.5%) bicornuate, (20%) unicornuate (33.3%) didelphic uteri patients. Malpresentation due to less space in uterine cavity is oftenly seen. (62.5%) septate, (27.3%) bicornuate, (40%) unicornuate, (50%) didelphic and (66.7%) of arcuate uteri patients are having malpresentation of fetus. Due to less space and improper blood perfusion intrauterine growth restriction is also major problem in uterovaginal anomaly [12]. (37.5%) of septate (18.2%) of bicornuate, (40%) of unicornuate, (33.3%) of didelphic, (100%) of arcuate uteri patients having fetus whose development are not appropriate for age of fetus. And due to less space in uterine cavity and suboptimal blood perfusion most of the fetus in this congenitally malformed uterus do not reach till term and lead operative intervention to successfully out the baby from uterus. Miller (1922) drew attention to higher incidence of threatened and inevitable abortion in cases pregnancy associated with congenital uterine anomalis. [13] Acien (93) studied 176 patients with uterine malformations including bicornuate (n=49) and bicorning bicollin (n=17) and reported that patients with uterine malformation have higher rates of reproductive loss, preterm delivery, malpresentation and complications that increase obstetric intervention and perinatal mortality.

Conclusion

Every gynecologist and obstetrician should have adequate knowledge about occurrence corrective treatment to increase fertility outcome, possible complication in such pregnancies and their proper management to successfully save the live of mother and fetus. Most of previous studies have been dealt with individual abnormality. Our study evaluated fertility problems and obstetric problems related to various types of congenital uterine anomalies. Septate uteri were most common mullerian duct anomalies. Most of the uterovaginal anomalies were detected by accurate technique like transvaginal USG and MRI. But for diagnosis of some anomaly both the USG and MRI were required. common antenatal findings were anemia, miscarriage, intrauterine fetal growth restriction and malpresentation.

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