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# Original Research

## Assessment of efficacy of MRI in detecting female infertility

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***ABSTRACT:***

**Background:** Infertility is defined as the inability of a couple to conceive naturally after one year of regular unprotected sexual intercourse. The present study was conducted to assess efficacy of MRI in detecting female infertility. **Materials & Methods:** 56females age ranged 20-40 years were enrolled. Symptoms such as pelvic pain, dysmenorrhoea etc. was noted. A serum hCG test was done before the examinations.MRI was performed on a 1.5 Tesla unit equipped with a 32 phased-array surface coil, with the patient in the supine position. On MRI various anomalies were recorded. **Results:** Age group 20-35 years had 15, 26-30 years had 12, 31-35 years had 8 and 36-40 years had 21 patients. Causes of female infertility was adenomyosis in 10, PCOS in 4, tubal disease in 16, endometrial polyps in 18, pelvic inflammatory disease in 4, endometriosis in 2 and leiomyoma in 2 cases. A significant difference was observed (P< 0.05). **Conclusion:** MRI is an excellent non-invasive method for the evaluation of female infertility.

**Key words:** Female, infertility, MRI

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## INTRODUCTION

Infertility is defined as the inability of a couple to conceive naturally after one year of regular unprotected sexual intercourse. This clinical entity which bears extreme social relevance affects 13-15% couples globally. Amongst the common causes of female infertility, 30-50% of cases are due to tubal and peritubal disorders, while ovarian disorders account for 30-40% of all cases of female infertility.[1]

MR imaging is well known to provide accurate information for differentiation of congenital uterine anomalies and detection and localization of uterine leiomyomas.[2] One of the advantages of MR imaging is the non-use of ionizing radiation, which is an important consideration in women of reproductive age.[3] Another advantage is that MR imaging is less invasive and less observer dependent than the classic imaging techniques. Furthermore, recent advances in MR imaging with the phased-array coil have created further imaging possibilities, resulting in excellent spatial and tissue contrast resolution, multiplanar capability, and fast techniques.[4]

MRI also detects pathological lesions, including tubal lesions and pituitary adenoma. It helps in predicting the prognosis in conservatively treated cases of leiomyoma, adenomyosis, and endometriosis.[5] The present study was conducted to assess efficacy of MRI in detecting female infertility.

## MATERIALS & METHODS

The present study consisted of 56females age ranged 20-40 years. The consent was obtained from all enrolled patients.

Data such as name, ageetc. was recorded. Symptoms such as pelvic pain, dysmenorrhoea etc. was noted.A serum hCG test was done before the examinations.MRI was performed on a 1.5 Tesla unit equipped with a 32 phased-array surface coil, with the patient in the supine position. On MRI various anomalies were recorded.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

## RESULTS

**Table I Distribution of cases**

| Age group (Years) | Number | P value |
|---|---|---|
| 20-25 | 15 | 0.04 |
| 26-30 | 12 | |
| 31-35 | 8 | |
| 36-40 | 21 | |

Table I, graph I shows thatage group 20-35 years had 15, 26-30 years had 12, 31-35 years had 8 and 36-40 years had 21 patients. The difference was significant (P< 0.05).

**Graph I Distribution of cases**

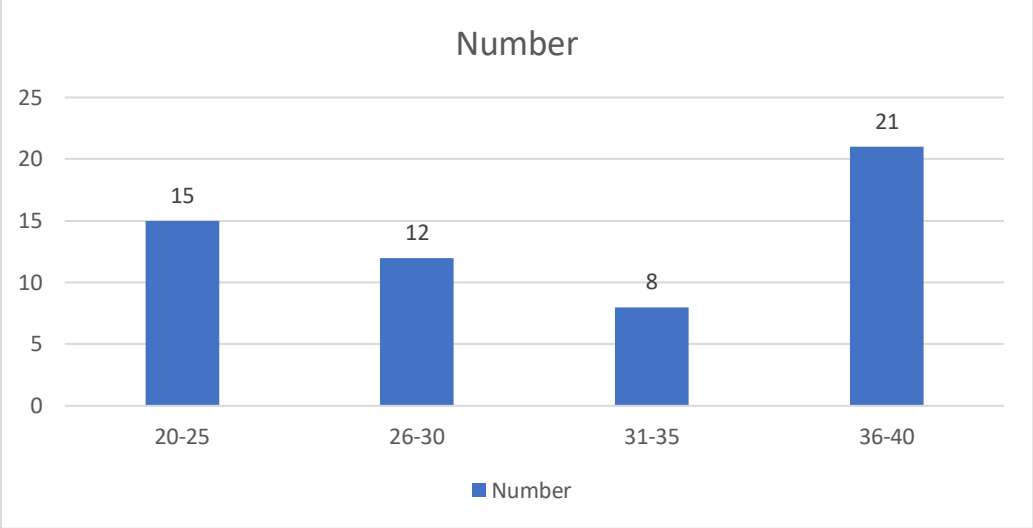
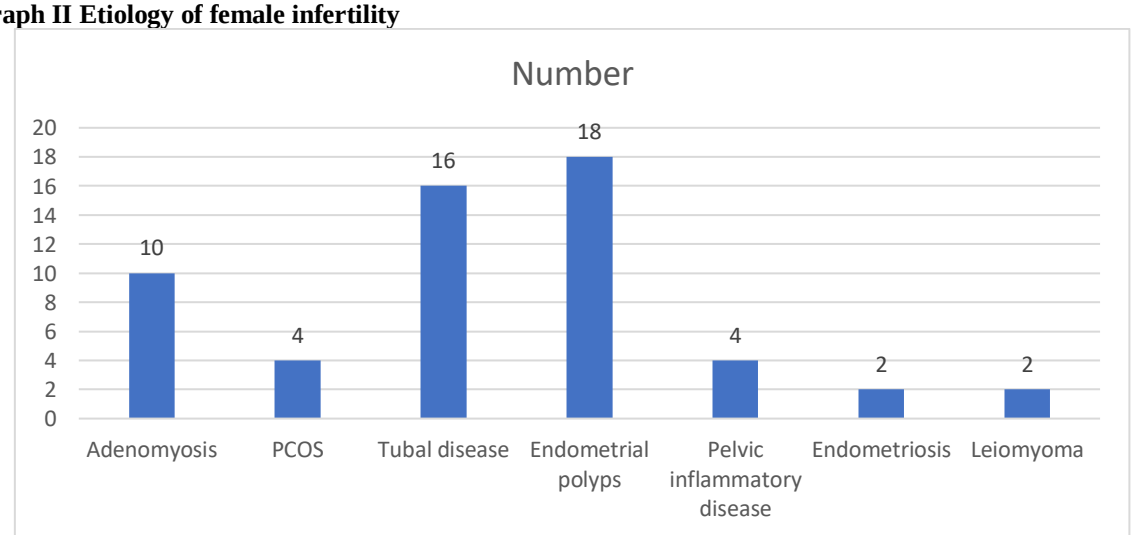



**Table II Etiology of female infertility**

| Causes | Number | P value |
|---|---|---|
| Adenomyosis | 10 | 0.01 |
| PCOS | 4 | |
| Tubal disease | 16 | |
| Endometrial polyps | 18 | |
| Pelvic inflammatory disease | 4 | |
| Endometriosis | 2 | |
| Leiomyoma | 2 | |

Table II, graph II shows that causes of female infertility was adenomyosis in 10, PCOS in 4, tubal diseasein 16, endometrial polyps in 18, pelvic inflammatory disease in 4, endometriosis in 2 andleiomyoma in 2 cases. A significant difference was observed (P< 0.05).

**Graph II Etiology of female infertility**



## DISCUSSION

Infertility is defined as 1 year of unprotected intercourse that does not result in pregnancy. In recent years, demand for infertility services and treatment of infertility have increased. Laparoscopy, hysteroscopy, and hysterosalpingography are the most effective techniques currently used to evaluate female pelvic disorders related to infertility.[6] Although transvaginal ultrasonography (US) has been the foremost imaging modality for assessing the female genital tract, magnetic resonance (MR) imaging has also been used for over 10 years to evaluate problems associated with female infertility.[7]The present study was conducted to assess efficacy of MRI in detecting female infertility.

We found that age group 20-35 years had 15, 26-30 years had 12, 31-35 years had 8 and 36-40 years had 21 patients.Various investigators have opined that MRI has a superior sensitivity (95% vs 81%), specificity (89% vs. 78%), and overall diagnostic accuracy (93% vs. 80%) for the diagnosis of pelvic inflammatory disease as compared to transvaginal ultrasound. These authors have further concluded that the superior performance of MRI may reduce the need for diagnostic laparoscopy. Diffusion-weighted MRI shows superior sensitivity (100% vs. 47.1%), specificity (97.1% vs. 91.4%), positive predictive value (97.1% vs. 84.2%), negative predictive value (100% vs 64%), and overall accuracy (98.6% vs. 69.6%) as compared to standard MRI sequences in assessment of tubo-ovarian abscess.[8,9]

We observed that causes of female infertility was adenomyosis in 10, PCOS in 4, tubal disease in 16, endometrial polyps in 18, pelvic inflammatory diseasein 4, endometriosis in 2 and leiomyoma in 2 cases. MRI is the modality of choice and has a reported accuracy of up to 100% sensitivity and specificity in the evaluation and classification of MDAs.[10] MR-based classification systems as proposed by all, the European Society of Human Reproduction and Embryology/European Society for Gynaecological Endoscopy ESHRE/ESGE and those by the American Society for Reproductive Medicine (ASRM) are all currently acceptable. A detailed description of these anomalies are beyond the scope of this article. Few recent reports do cite that 3D ultrasound has similar diagnostic accuracy as MRI in the evaluation of Mullerian ductal anomalies, but the technique however has a limitation in the lack of wide availability of expertise.[11]

Myomectomy is a surgical procedure for patients who hope to preserve fertility. The reported rate of successful conception after myomectomy was 59.5% for patients with leiomyoma-associated infertility when there was no other apparent cause of infertility.[12] A US study of uterine remodeling after myomectomy revealed a gradual decrease in uterine volume in the 6 months after the procedure, with the most remarkable change occurring in the initial 2–3 months. In an MR imaging study, the most remarkable uterine change occurred 1 month after myomectomy and consisted of a reduction in uterine volume and a proportionally normal zonal anatomy.[13]

## CONCLUSION

Authors found that MRI is an excellent non-invasive method for the evaluation of female infertility.

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