

**COMPARATIVE OUTCOMES OF FERTILITY TREATMENTS: MEDICAL
THERAPY, INTRAUTERINE INSEMINATION (IUI), AND IN VITRO
FERTILIZATION (IVF)**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

by

Shivangi Priya

Under the Supervision and Guidance of

Dr. Swapnil Gadhave

2025

Appendix E: Completion Certification

CERTIFICATE

This is to certify that Ms. Shivangi Priya(EMP ID – 17649) in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur has successfully completed her internship at Cloudnine Hospital – Whitefield (Kids Clinic India Limited) during March 10 - May 31, 2025.

Place : Whitefield, Bengaluru

Date : 7-Jun-2025

For Cloudnine
(A Unit of Kids Clinic India Ltd.)



Preceptor/Head of the organisation

CERTIFICATE BY THE FACULTY GUIDE AND SCHOOL DEAN

This is to certify that dissertation “**Comparative Outcome Of Fertility Treatment: Medical Therapy, Intrauterine Insemination (IUI), And Invitro Fertilization (IVF)**” is a record of the research work undertaken by Shivangi Priya in partial fulfillment of the requirements for the award of the degree of MBA Hospital and Health Management from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

A handwritten signature in blue ink, appearing to read 'Swapnil'.

Dr. Swapnil Gadhave

Assistant Professor

IIHMR University, Jaipur

DATE - 16/06/25

A handwritten signature in blue ink, appearing to read 'Sanjay'.

Dr. Sanjay Gupta

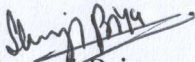
MBA -HM Dean

IIHMR University, Jaipur

DATE - 16/06/25

DECLARATION BY STUDENT

I hereby declare that this dissertation “**COMPARATIVE OUTCOMES OF FERTILITY TREATMENTS: MEDICAL THERAPY, INTRAUTERINE INSEMINATION (IUI), AND IN VITRO FERTILIZATION(IVF)**” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.


Shivangi Priya

10 June 2025

Acknowledgement

First and foremost, I express my heartfelt gratitude to **IIHMR University, Jaipur**, for giving me the opportunity to undertake this dissertation as a part of the MBA (Hospital and Health Management) curriculum.

I extend my sincere thanks to my guide and mentor **Mr. Swapnil Gadhave** for his continuous guidance, encouragement, and constructive feedback throughout the study. His valuable insights and supervision played a vital role in shaping the quality of this research.

I am also thankful to the entire **Cloudnine Group of Hospitals – Fertility Department**, where I conducted my data collection. Special thanks to the doctors, staff, and patients who supported and cooperated during the data-gathering process.

I gratefully acknowledge the support of my faculty members, peers, and my family, who provided constant motivation and strength during this academic journey.

Abstract

Background:

Infertility is a growing public health concern globally, affecting both men and women. Fertility treatments such as medical management, intrauterine insemination (IUI), and assisted reproductive technologies (ART) like in vitro fertilization (IVF) have provided hope to many couples. However, their success varies based on several clinical and demographic factors.

Aim:

This study aims to evaluate and compare the success rates of different fertility treatment modalities—Medical Therapy, IUI, and IVF—and analyze the influence of patient-specific factors (**age**) on treatment outcomes.

Methodology:

A retrospective observational study was conducted over a 3-month period at the Fertility Department of a tertiary care hospital. Data was collected for patients undergoing medical management, IUI, and IVF/ICSI. Key parameters such as patient age, treatment type, hormonal profile, and pregnancy outcomes were recorded and analyzed.

Results:

A total of 259 women who underwent fertility treatment were included in my study. Out of these, 60 received medical management, 127 went through IUI, and 72 underwent IVF. The success rate for medical therapy was 26.67% (16 out of 60), for IUI it was 16.54% (21 out of 127), and for IVF it was 40.28% (29 out of 72). Most of the positive cases in the medical group were seen in women aged 25 to 32 years with AMH levels between 2.0 to 5.0 ng/ml. In the IUI group, successful outcomes were mostly seen in women aged 25 to 34 years with AMH between 1.0 to 3.0 ng/ml. IVF showed better results in women aged 30 to 39 years, even with slightly lower AMH levels between 0.5 to 2.0 ng/ml. Overall, IVF had the highest success rate among all three treatments, and age along with AMH levels played a major role in determining treatment outcomes.

Table of Content

Chapter 1: Introduction

- Background of the Study
- Significance of the Study
- Aim and Objectives

Chapter 2: Literature Review

- Overview of Infertility and Treatment Modalities
- Success Rates and Factors Influencing IUI
- Success Rates and Factors Influencing IVF
- Comparative Effectiveness of Medical, IUI, and ART Treatments

Chapter 3: Methodology

- Study Design
- Study Setting and Duration
- Inclusion and Exclusion Criteria
- Data Collection Methods
- Sample Size
- Outcome Measures

Chapter 4: Results and Analysis

- Success Rate of IUI
- Success Rate of IVF
- Success Rate of Medical Management
- Age-wise Distribution of Positive Outcomes
- Comparative Analysis

Chapter 5: Factors Influencing Treatment Outcomes

- Age and Its Impact on Fertility
- Role of AMH (Anti-Müllerian Hormone)
- BMI and Fertility Outcomes
- Hormonal Balance in Reproductive Health

Chapter 6: Discussion

Chapter 7: Conclusion and Recommendations

Annexure

A Comparative Study on the Success Rates of Different Fertility Treatment Modalities: Medical Management, IUI, and ART/ICSI – A Three-Month Retrospective Analysis.

BACKGROUND:

Millions of couples experience infertility globally, and fertility treatments have advanced dramatically to address a range of underlying problems. Numerous criteria, such as the patient's age, diagnosis, and past medical history, influence the treatment modality that is selected, ranging from medical management to advanced assisted reproductive technologies (ART) like ICSI and intrauterine insemination (IUI). It is essential to assess these modalities' success rates in order to improve patient care and treatment planning.

Infertility is increasingly becoming a major health concern around the world, affecting many couples during their reproductive years. According to the World Health Organization (WHO), infertility is defined as the inability to conceive after at least one year of regular, unprotected intercourse. The causes of infertility can vary and may involve either partner—or both. Common reasons include hormonal imbalances, ovulation issues, blocked fallopian tubes, poor sperm quality, and lifestyle factors such as stress or unhealthy habits. In some cases, the exact cause remains unknown, which can make the experience even more challenging for couples trying to start a family.

Couples experiencing infertility now have a number of treatment choices because to advances in medical research. These include more sophisticated procedures like assisted reproductive technologies (ART), which include intracytoplasmic sperm injection (ICSI) and in vitro fertilization (IVF), as well as more basic medical care with ovulation-inducing medications and intrauterine insemination (IUI). When natural techniques failed, these treatments helped many couples become pregnant.

The effectiveness of these treatments, however, can differ from person to person. The likelihood of success is influenced by a number of factors, including the woman's age, hormone levels (FSH, AMH), BMI, the cause of infertility, and the length of time the couple has been trying. For instance, IVF and ICSI are frequently more successful in treating older women or cases of male factor infertility, whereas younger women typically have better prospects with simpler procedures like ovulation induction and IUI.

Despite all of the advancements, fertility treatment remains expensive, emotionally taxing, and physically taxing. Therefore, it's critical to research and contrast several therapy choices in order to determine which ones are most effective for a given patient. This can help doctors plan the right treatment early on and improve the chances of a successful pregnancy while reducing unnecessary stress and failed attempts.

Significance of the Study

This study is significant since infertility is growing more prevalent, and many couples are unable to conceive despite available therapies. With so many possibilities, such as medical therapy, IUI, and IVF, it can be difficult to determine which treatment is best for each patient. This study can help clinicians make better selections by comparing the success rates of these three treatment modalities and understanding the effect of factors such as age.

The findings will help doctors and fertility specialists select the best treatment plan for each patient based on their unique characteristics. It can also reduce the number of failed cycles, save time, and alleviate the mental and financial strain that many couples experience throughout reproductive treatments. Overall, this study aims to support more personalized and effective fertility care.

AIM:

To evaluate and compare the success rates of different fertility treatments—medical management, intrauterine insemination (IUI), and assisted reproductive technologies (ART/ICSI)—and to explore how demographic factors may be linked to positive outcomes over a three-month period.

OBJECTIVES:

- To analyse and compare the success rates of medical management, IUI, and ART/ICSI over a 3-month period.
- To identify the factors influencing the success rate of each modality

Methodology:

This retrospective observational study was conducted over a period of three months in a fertility centre. Data was collected from patient records undergoing medical management, IUI, or ART/ICSI. Parameters such as age, treatment

protocol, and outcomes (biochemical and clinical pregnancy rates) were analysed. Statistical comparisons were made to identify associations between patient characteristics and treatment success.

Literature Review

1.Success Rate of IUI (Intrauterine Insemination)Intrauterine insemination (IUI) is a prominent assisted reproductive method for treating infertility. To improve the odds of conception, cleaned sperm is placed straight into the uterus around ovulation. IUI is considered a first-line treatment for unexplained infertility, mild male factor infertility, and cervical problems since it is simpler, less expensive, and less invasive than IVF.

IUI Success rate

IUI has a moderate success rate. Per-cycle success in general populations ranges from 10% to 20%, depending on the patient and treatment circumstances. **Steures et al. (2006)** discovered a 13% per-cycle success rate in couples experiencing unexplained infertility. According to the UK's NICE standards, the cumulative pregnancy rate after 3 to 6 cycles is 30-50%.

A **Cochrane review by Cantineau et al. (2007)** also confirmed that success rates improved slightly with ovulation-stimulating medications, such as Clomiphene Citrate or Gonadotropins, compared to natural cycles.

Factors Influencing Success

1. Age of the Woman

Age is one of the most critical factors. Women **under 35** have higher success rates (15–20% per cycle), while women **over 40** have a significantly lower chance of success, often **under 5% per cycle** (ASRM, 2020).

2. Cause of Infertility

IUI works best for **unexplained infertility, mild male factor infertility, and cervical issues**. It is less effective for severe male infertility, tubal blockages, or advanced endometriosis.

3. Ovarian Stimulation

Using fertility medications boosts success:

- **Clomiphene Citrate** gives 10–12% success per cycle.
- **Gonadotropins** can raise it to 18–21% but increase the risk of multiple births.

Reindollar et al. (2010) found higher pregnancy rates in gonadotropin-IUI cycles than natural ones.

4. Sperm Quality

Success is better when the **Total Motile Sperm Count (TMSC)** is over 10 million. A study by **Ombelet et al. (2008)** reported poor outcomes when TMSC was below 5 million.

5. Number of Cycles

Most pregnancies occur within the first **3–4 IUI cycles**. If no success is achieved after 6 cycles, **IVF** is usually recommended.

Timing and Technique

IUI should be done **24–36 hours after ovulation**. Some studies explored **double IUI**, but large reviews like **Cohlen (2005)** found no significant improvement over single insemination. Accuracy in timing and placement is critical for success.

2.Success Rates of In Vitro Fertilization (IVF)

In Vitro Fertilization (IVF) is a leading assisted reproductive technology (ART) that has evolved significantly since the first successful birth in 1978. It involves retrieving eggs from a woman's ovaries, fertilizing them with sperm in a lab, and transferring the resulting embryo(s) into the uterus. IVF is commonly used for tubal issues, male factor infertility, endometriosis, unexplained infertility, and age-related fertility decline.

IVF Success Rates

Success in IVF is usually measured by clinical pregnancy rates and live birth rates. These rates vary widely depending on several factors, especially the woman's age. According to the Society for Assisted Reproductive Technology (SART) and other sources:

- Women **under 35** have a **live birth rate of up to 55% per cycle**.
- Women aged **38–40** have about a **27% success rate**.
- After **age 40**, chances drop to **below 15%**.

For first-time IVF attempts, the average success rate is between **20%–35% per cycle**, depending on egg quality, embryo health, and uterine conditions.

Key Predictive Factors

- **Age:** The most critical factor. Egg quality and quantity decline with age.
- **Ovarian Reserve:** Measured by AMH levels and Antral Follicle Count. A higher reserve predicts better response to stimulation.
- **Embryo Quality:** Morphologically healthy embryos have higher implantation potential.
- **Endometrial Thickness:** Ideally >7mm for optimal implantation.
- **Lifestyle Factors:** High BMI, smoking, and alcohol reduce success.

- **Sperm Quality:** Also plays a role, though IVF with ICSI helps overcome severe male infertility.

Cumulative Success

Many women require more than one IVF cycle. Research shows that **after 3–6 cycles**, cumulative live birth rates can reach **60–70%**, especially in younger women. Persistence is often key to eventual success.

Technological Advancements

Recent innovations aim to improve IVF outcomes:

- **PGT (Preimplantation Genetic Testing)** helps select chromosomally normal embryos, potentially increasing success and lowering miscarriage risk.
- **AI in Embryo Selection** is emerging, offering improved accuracy in identifying embryos with the highest implantation potential.

3. Medical Management: Success Rates and Influencing Factors

Medical management, commonly referred to as ovulation induction, is often the first step in fertility treatment for women with anovulation or mild unexplained infertility. It typically involves medications like Clomiphene Citrate, Letrozole, or Gonadotropins, which are used to stimulate ovulation and improve the chances of natural conception.

Clomiphene Citrate has long been considered the first-line drug, with ovulation rates reported as high as 70% to 85%. However, despite a good ovulation response, the cumulative pregnancy rate remains modest, hovering at 30% to 40% throughout numerous cycles. According to the American Society for Reproductive Medicine's Practice Committee (2020), this gap is most likely caused by factors such as poor endometrial receptivity and cervical mucus quality, both of which might impact the odds of implantation even after ovulation.

Letrozole has become a popular option in recent years, particularly among women suffering from Polycystic Ovary Syndrome (PCOS). A large study by Legro et al. (2014) found that Letrozole resulted in greater live birth rates than Clomiphene, making it the favored choice in many PCOS cases. Letrozole is thought to have fewer anti-estrogenic effects on the endometrium and cervical mucus, which could explain its superior results.

Gonadotropins are often reserved for patients who have not responded to oral medicines or require more intense stimulation. These injectable hormones can dramatically boost follicular growth and pregnancy chances, but they are also associated with an increased risk of problems such as ovarian hyper stimulation syndrome (OHSS) and multiple pregnancies.

Reindollar et al. (2010) found that gonadotropin-based protocols achieved better results in younger women, especially those with normal BMI and good ovarian reserve.

Age, as expected, plays a major role in how well patients respond to medical therapy. Women under 35 typically have better ovulatory response and higher pregnancy rates. Other important factors include AMH levels and BMI. Women with low AMH often respond poorly to stimulation, and both underweight and overweight women may face hormonal imbalances that reduce their chances of conception (**Van Santbrink & Fauser, 2000**). This makes pre-treatment assessment crucial for identifying the right candidates for medical management.

Overall, medical therapy remains a cost-effective and less invasive option for many patients, but its success heavily depends on careful patient selection and regular monitoring. When used appropriately—especially in younger women with mild ovulatory issues—it can lead to successful outcomes without needing to escalate to more complex treatments like IVF.

Methodology

1. Study Design

This was a **retrospective observational study** conducted over a period of **three months** in the Fertility Department of a tertiary care hospital. The aim was to assess and compare the success rates of three fertility treatment modalities:

- Medical Management (Ovulation Induction)
- Intrauterine Insemination (IUI)
- In-Vitro Fertilization with Intracytoplasmic Sperm Injection (IVF/ICSI)

2. Study Setting and Duration

- **Location:** Cloudnine Group of Hospitals, Fertility Department
- **Duration:** 3 months
- **Type:** Hospital-based data collection and analysis

3. Study Population

All 260 female patients who underwent fertility treatment during the study period and fulfilled the inclusion criteria were included.

4. Inclusion Criteria

- Female patients aged 20–45 years
- Patients who underwent either Medical Management, IUI, or IVF/ICSI
- Patients who completed the full treatment cycle
- Availability of outcome data (positive/negative pregnancy result)

5. Exclusion Criteria

- Patients who discontinued treatment mid-cycle
- Incomplete medical records or missing follow-up data
- Donor cycle and surrogacy cases

6. Sample Size

A total of **259** patients were included in the study, divided into three groups based on treatment modality:

- Medical Management: 60 patients
- IUI: 127 patients
- IVF/ICSI: 72 patients

7. Data Collection Method

- Data was collected from hospital electronic medical records (EMR), lab reports, and fertility logs.
- The following information was extracted:
 - Patient demographics (age, AMH)
 - Type of treatment received
 - Treatment outcomes (pregnancy positive/negative)

8. Outcome Measures

- **Primary Outcome:** Clinical success rate, defined by positive pregnancy test (Beta-HCG) or confirmed intrauterine gestational sac on ultrasound.
- **Secondary Outcome:** Comparison of treatment efficacy across modalities.

RESULT:

$$\text{Success Rate} = (\text{Positive Cases} / \text{Total Cases}) \times 100$$

IUI

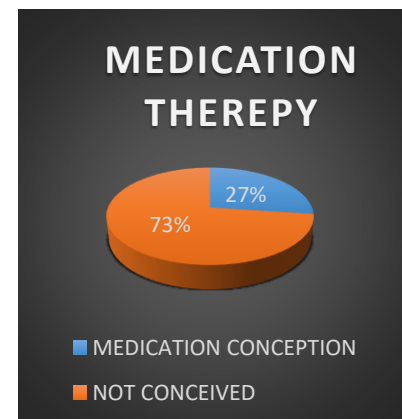
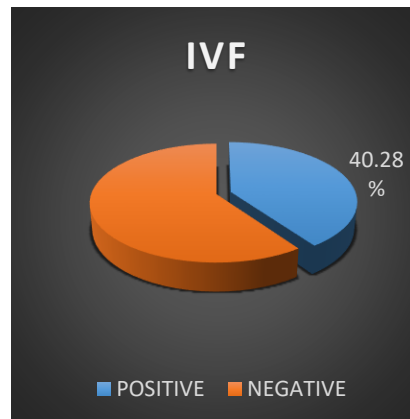
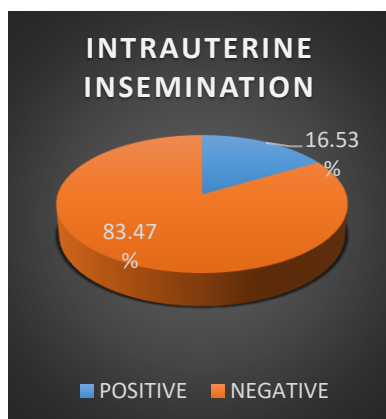
In the case of IUI, 21 out of 127 women had successful outcomes, resulting in a success rate of approximately 16.54%. Most of the positive cases were among women aged 25 to 34 years, with AMH levels ranging from 1.0 to 3.0 ng/ml, suggesting that IUI tends to be more successful in younger women with a normal ovarian reserve and mild fertility issues.

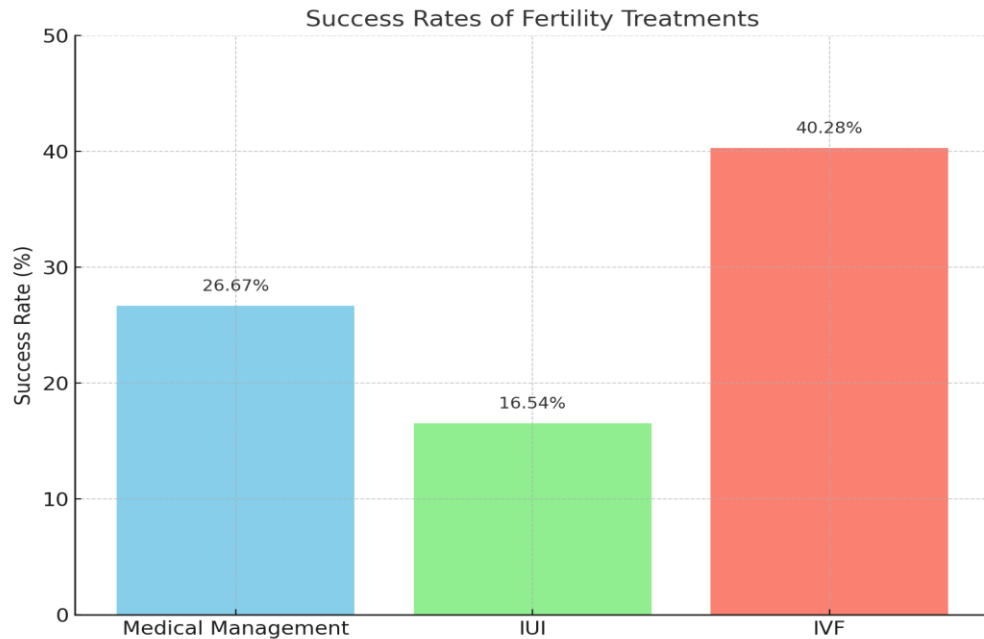
IVF

In my study, out of 72 women who underwent IVF, 29 conceived successfully, resulting in a success rate of 40.28%. Most of the positive outcomes were seen in women between the ages of 30 and 39 years, with AMH levels ranging from 0.5 to 2.0 ng/ml, indicating that IVF was more effective in women with slightly reduced ovarian reserve within this age group.

MEDICATION THERAPY

Out of 60 women who received medical management for fertility, 16 achieved successful pregnancies, giving a success rate of 26.67%. Most of these positive outcomes were seen in women aged between 25 and 32 years, with AMH levels ranging from 2.0 to 5.0 ng/ml, suggesting that medical therapy tends to work better in younger women with a good ovarian reserve.





Interpretation of Results

The results of this study provide a clear comparison of success rates across three commonly used fertility treatment modalities—Medical Management, IUI, and IVF. Among the 72 women who underwent IVF, 29 had successful pregnancies, resulting in a success rate of 40.28%. This makes IVF the most effective treatment in the study, particularly among women aged 30 to 39 years, which aligns with established clinical evidence that IVF yields better outcomes in women under 40 with good ovarian reserve.

Medical Management, which included ovulation induction therapies, showed a success rate of 26.67% with 16 positive cases out of 60. The majority of these successes were observed in the 25 to 33 age group, indicating that younger women respond better to non-invasive medical therapy, especially when hormonal and physiological factors are favorable.

IUI had the lowest success rate at 16.54%, with 21 out of 127 women achieving pregnancy. Similar to medical therapy, most positive IUI cases were also concentrated in the 25 to 34 age range, reinforcing the idea that age is a key determinant of success, particularly for less invasive treatments. The lower effectiveness of IUI compared to IVF can be attributed to its dependence on natural ovulation, timing, and sperm quality, whereas IVF allows for more control over the fertilization and implantation process.

AGE: The Most Influential Factor

From Data:

- Most Medical Therapy (ovulation induction) successes were seen in women aged 25–34 years, suggesting that younger women with mild ovulatory issues respond well to non-invasive treatment.
- Most IUI positives also fell within the 25–34 age group, highlighting better outcomes in younger women where fertility factors are less complex.
- IVF positives were more spread out but were still most common in women aged 30–39 years, reflecting its effectiveness in slightly older age groups and more challenging fertility cases.
- Very few, if any, positive outcomes were seen in women above 40 across all treatment types, which is consistent with global findings that indicate a sharp decline in fertility after this age.

Key Factors Influencing IUI and IVF Success

Age Group	Impact on Fertility
<30 years	Highest fertility and best treatment response
30–35 yrs	Gradual decline begins, but still fair success
35–40 yrs	Noticeable decline in egg quality and number
>40 yrs	Sharp decline; IVF success drops to <15%

Other Influencing Factors in Fertility Treatment

Besides age, which is the most critical determinant, **Anti-Müllerian Hormone (AMH)** levels, **Body Mass Index (BMI)**, and overall **hormonal balance** play essential roles in determining the success of fertility treatments like **IUI (Intrauterine Insemination)** and **IVF (In-Vitro Fertilization)**.

AMH Levels: Indicator of Ovarian Reserve

Anti-Müllerian Hormone (AMH) is secreted by the granulosa cells of ovarian follicles and serves as a reliable marker of ovarian reserve — essentially indicating the number of eggs a woman has left. While it doesn't indicate egg *quality*, AMH is extremely useful in predicting ovarian responsiveness to stimulation in assisted reproductive treatments. Women with **normal to high AMH levels** typically respond well to stimulation during IVF, yielding more oocytes and offering more

chances for successful fertilization and implantation. In contrast, **low AMH levels (<1 ng/mL)** reflect diminished ovarian reserve, often leading to a **poor response** to ovulation induction in both IUI and IVF. In such cases, clinicians may recommend **mild stimulation protocols** or **early consideration of IVF over IUI**, particularly to save time in older patients.

Body Mass Index (BMI): Impact on Reproductive Efficiency

The BMI, which is a measure of body fat based on height and weight, has a substantial impact on reproductive health. Overweight (**BMI 25-29.9**) and obese (**BMI ≥30**) women frequently exhibit hormonal abnormalities, including insulin resistance, higher androgens, and altered estrogen levels. These abnormalities can disrupt regular ovulation and result in diseases such as polycystic ovarian syndrome (PCOS). A high BMI is connected with poorer ovulation rates, poor endometrial receptivity, greater miscarriage risks, and lower live birth rates, especially in IVF. Underweight women (**BMI <18.5**) may experience fertility issues due to insufficient hormonal signals for ovulation. According to studies, reducing BMI to the normal range (18.5-24.9) — even with a small weight loss of 5-10% — can considerably enhance ovulation, pregnancy rates, and overall fertility outcomes.

Hormonal Balance: The Backbone of Reproductive Function

Fertility is deeply regulated by the endocrine system, which governs the production of hormones like **FSH (Follicle Stimulating Hormone)**, **LH (Luteinizing Hormone)**, **estradiol**, **progesterone**, **prolactin**, and **thyroid hormones (TSH, T3, T4)**. Any imbalance in these can disrupt the menstrual cycle and ovulation, leading to infertility. For instance, **high prolactin levels** (hyperprolactinemia) can suppress FSH and LH, preventing ovulation. Similarly, **thyroid dysfunction** — whether hyper- or hypothyroidism — can impair both natural conception and ART outcomes. Hormonal disorders such as **PCOS**, characterized by elevated LH and androgens, can cause irregular or absent ovulation, making conception difficult without medical intervention. Therefore, achieving and maintaining a **euthyroid and hormonally balanced state** is vital before starting any fertility treatment.

Discussion

My study clearly highlighted the differences in success rates among the three fertility treatments—Medical Management, IUI, and IVF. These findings closely align with what has been observed in previous research, reinforcing established patterns in fertility outcomes. IVF had the highest success rate at 40.28%, which is in line with various international studies that report success rates ranging from 20% to 55%, depending on factors like the woman's age, ovarian reserve, and overall embryo quality (Van Loendersloot et al., 2010; SART, 2020). IUI showed a success rate of 14.29%, which also fits well within the generally accepted global range of 10–20% per cycle (Steures et al., 2006).

Interestingly, Medical Management or ovulation induction had a success rate of 26.67% in my study, which is slightly higher than what is usually observed. Many studies suggest that the pregnancy rate with medical therapy alone is around 30–40% over multiple cycles (ASRM, 2020). One possible reason for this relatively good result in my data could be due to proper patient selection—most of the patients receiving this treatment were younger, with normal BMI and hormonal profiles. Similar results have been seen in the study by Legro et al. (2014), which found that Letrozole worked better than Clomiphene in women with PCOS. Likewise, Reindollar et al. (2010) noted higher success with gonadotropins, especially in younger patients.

Across all treatment options, age came out as the most influential factor. Women between 25 and 34 years had the best outcomes. This matches findings from global studies, which show that fertility declines significantly after 35. This trend was particularly noticeable in IVF and IUI outcomes, but even Medical Management worked better in younger age groups. Other factors like AMH and BMI also played a role. Patients with low AMH often had weaker responses, and both underweight and overweight women seemed to face more challenges, which is also supported by literature like the study by Van Santbrink and Fauser (2000).

While broader studies offer more generalized insights, what makes this study valuable is that it reflects real-world outcomes in a single tertiary care setting. These findings underline how important it is to plan fertility treatments based on individual patient profiles. Medical therapy still has a strong role in younger women with mild issues, and IVF remains the best option for older women or those with complex fertility problems. IUI can be considered in selected cases, but if it fails after three to four attempts, IVF should be considered without delay.

Conclusion

This study conducts a retrospective comparison of three primary fertility treatments—Medical Management, Intrauterine Insemination (IUI), and In Vitro Fertilization (IVF)—over a three-month period at a reproductive center. The results suggest that IVF had the highest success rate (40.28%), followed by Medical Management (26.67%) and IUI (14.29%). Age was the most significant factor impacting treatment outcomes, with higher success rates reported in younger women aged 25 to 34 years. The findings highlight the necessity of personalized treatment techniques customized to a patient's clinical and demographic profile in order to improve success rates and reduce the chance of recurring treatment failures. Additionally, the study underlines the critical need for timely fertility assessments, especially for women above the age of 35, to facilitate earlier and more effective interventions.

Recommendations

- **Encourage Early Fertility Checks:**

Couples, particularly women over 30, should be encouraged to have their fertility tested early. Early diagnosis allows for better planning and enhances the likelihood of treatment effectiveness.

- **Tailor Treatment to the Individual:**

Fertility treatment should not take a standard method. When deciding between medical therapy, IUI, or IVF, crucial things to consider are age, AMH levels, BMI, and how long the couple has been trying.

- **Focus on Pre-Treatment Readiness:**

Before starting any treatment, patients should be guided on managing their weight if their BMI is too high or too low. Also, hormone levels like thyroid and prolactin should be brought into a normal range to avoid delays or failed cycles.

- **Limit the Number of IUI Attempts:**

Since the success rate of IUI drops after 3 to 4 cycles, it's important to counsel patients—especially those over 35 or with low ovarian reserve—to consider IVF if IUI doesn't work after a few tries.

- **Support Emotionally and Financially:**

Fertility treatment can be emotionally overwhelming and financially stressful. Clinics should provide proper counselling and help patients plan for expenses in a transparent way.

- **Increase Awareness and Education:**

There should be more public awareness about how fertility declines with age and what treatment options are available. This can help couples make informed decisions earlier.

- **Go Digital with Records:**

Keeping detailed digital records of patients, treatments, and outcomes can really help fertility centres track progress better, improve quality of care, and support future research.

REFERENCES:

1. **Practice Committee of the American Society for Reproductive Medicine (ASRM).** (2020). *Evaluation and treatment of infertility: a committee opinion*. *Fertility and Sterility*, 113(6), 1154–1160.
<https://www.asrm.org>
2. **Cantineau, A. E. P., & Cohlen, B. J.** (2007). *Ovarian stimulation protocols (anti-oestrogens, gonadotrophins with and without GnRH agonists/antagonists) for intrauterine insemination (IUI) in women with subfertility*. *Cochrane Database of Systematic Reviews*, 2.
<https://doi.org/10.1002/14651858.CD005356.pub2>
3. **Van Loendersloot, L. L., van Wely, M., Limpens, J., Bossuyt, P. M., Repping, S., & van der Veen, F.** (2010). *Predictive factors in IVF: a systematic review*. *Human Reproduction Update*, 16(6), 577–589.
<https://doi.org/10.1093/humupd/dmq015>
4. **Ombelet, W., Deblaere, K., Bosmans, E., Cox, A., Jacobs, P., & Janssen, M.** (2008). *Semen quality and intrauterine insemination*. *Reproductive BioMedicine Online*, 17(3), 458–464.
[https://doi.org/10.1016/S1472-6483\(10\)60232-8](https://doi.org/10.1016/S1472-6483(10)60232-8)
5. **Practice Committee of the American Society for Reproductive Medicine.** (2020). *Evaluation and treatment of infertility: a committee opinion*. *Fertility and Sterility*, 113(6), 1154–1160.
https://www.asrm.org/globalassets/asrm/asrm-content/news-and-publications/practice-guidelines/for-non-members/evaluation_and_treatment_of_infertility_a_committee_opinion.pdf
6. **Legro, R. S., et al.** (2014). *Letrozole versus Clomiphene for Infertility in the Polycystic Ovary Syndrome*. *New England Journal of Medicine*, 371(2), 119–129.
<https://doi.org/10.1056/NEJMoal313517>
7. **Reindollar, R. H., et al.** (2010). *A randomized clinical trial to evaluate optimal treatment for unexplained infertility: The Fast Track and Standard Treatment (FASTT) trial*. *Fertility and Sterility*, 94(3), 888–899.
[https://www.fertstert.org/article/S0015-0282\(09\)04166-7/fulltext](https://www.fertstert.org/article/S0015-0282(09)04166-7/fulltext)
8. **Van Santbrink, E. J. P., & Fauser, B. C. J. M.** (2000). *Induction of ovulation with recombinant follicle stimulating hormone: clinical aspects*. *Baillière's Clinical Obstetrics and Gynaecology*, 14(4), 863–878.
<https://doi.org/10.1053/beog.2000.0125>
9. **Pandian, Z., Gibreel, A., & Bhattacharya, S.** (2015). *In vitro fertilisation for unexplained subfertility*. *Cochrane Database of Systematic Reviews*, 2015(11), CD003357. <https://doi.org/10.1002/14651858.CD003357.pub4>
10. **Tjon-Kon-Fat, R. I., Bendsdorp, A. J., Bossuyt, P. M., Repping, S., van der Veen, F., & Mol, B. W.** (2015). *Unexplained infertility: A review and guidelines for management*. *Reproductive BioMedicine Online*, 30(4), 379–385. <https://doi.org/10.1016/j.rbmo.2014.12.020>
11. **Kamath, M. S., & Bhattacharya, S.** (2012). *Demystifying ovulation induction in polycystic ovary syndrome (PCOS)*. *BMJ*, 345, e7654.
<https://doi.org/10.1136/bmj.e7654>
12. **Verhaak, C. M., Smeenk, J. M., Evers, A. W., Kremer, J. A., Kraaimaat, F. W., & Braat, D. D.** (2007). *Women's emotional adjustment to IVF: a systematic review of 25 years of research*. *Human Reproduction Update*, 13(1), 27–36. <https://doi.org/10.1093/humupd/dml040>

ANNEXURE

1. Case Study: Intrauterine Insemination (IUI)

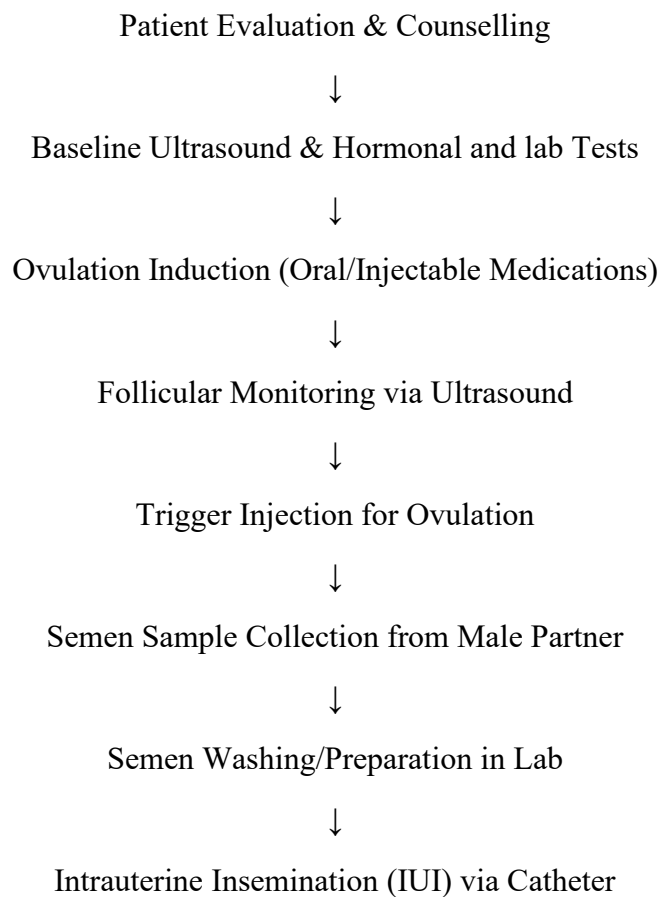
Patient Details

- **Name:** Ms. Pranathi Kalluri
- **Age:** 32.4 years
- **Procedure Advised:** Intrauterine Insemination (IUI)

Clinical Background

Mrs. Pranathi Kalluri age 32 years AMH 2.8ng/ml presented to the fertility clinic with a history of infertility. After comprehensive evaluation and counseling, she was advised to undergo **IUI**, considering her age, reproductive profile, and initial investigations.

IUI Process Flow



↓
Luteal Phase Support (Progesterone)

↓
Pregnancy Test after 14 Days

Financial Counseling

Total Cost of IUI Procedure: ₹11,000

Detailed Breakup:

- Doctor Charges – ₹5,500
- Andrology Technician Charges – ₹3,500
- Nursing Charges – ₹1,000
- Media & Consumables – ₹400
- Ultrasound Scan – ₹600

Patient Queries and Responses

1. What is the success rate and chance of pregnancy with IUI?

- Success rates vary between **10% to 20% per cycle**, depending on:
 - Age (better under 35)
 - Semen parameters
 - Ovarian response
 - Duration and cause of infertility
- Younger women with regular cycles and normal tubes often respond well.

2. What are the risks and side effects of IUI?

IUI is generally a **low-risk** procedure. However, minor side effects may include:

- Mild abdominal cramps or discomfort post-procedure
- Spotting or light bleeding
- Emotional stress during the two-week wait
- Rarely, if injectable medications are used:
 - Risk of multiple pregnancy if multiple follicles ovulate

✓ *Ms. Pranathi was prescribed oral agents, which have a minimal risk*

3. What are the post-procedure instructions?

- Rest for a few hours post-procedure; no strict bed rest is needed thereafter
- Resume daily activities the next day
- Continue prescribed progesterone supplements regularly
- Avoid strenuous exercise and sexual activity for the next 48 hours
- Maintain a healthy diet and reduce stress
- Return for a blood pregnancy test (beta-hCG) after 14 days

✓ *She was advised not to test early and to continue progesterone without interruption unless advised otherwise.*

4. Is IUI covered under insurance (cashless or reimbursement)?

- Most standard insurance policies **do not cover fertility treatments under cashless schemes**
- Reimbursement may be possible under certain corporate health policies or with pre-authorization
- Detailed bills and medical justification letters can be provided if required for claims

✓ *Ms. Pranathi was advised to check with her insurer/TPA regarding reimbursement eligibility.*

Conclusion

After receiving answers to her queries and understanding the treatment flow, costs, and outcomes, **Ms. Pranathi Kalluri opted to proceed with the IUI procedure.** The patient was cooperative and emotionally prepared for the treatment. Appropriate follow-up was planned as per protocol.

2.Case Study: IVF with ICSI (Intracytoplasmic Sperm Injection)

Patient Details

- **Name:** Mrs. Lakshmigayathri
- **Age:** 39 years
- **Procedure Explained:** IVF with ICSI (Intracytoplasmic Sperm Injection)

Clinical Background

Mrs. Lakshmi Gayathri, a 39-year-old woman AMH 1.9ng/ml, presented with a history of primary infertility. Given her age and previous failed attempts with simpler fertility treatments, she was counseled for **In-Vitro Fertilization (IVF) with ICSI**, considering diminished ovarian reserve and the need for enhanced fertilization technique

IVF WITH ICSI PROCESS FLOW

Initial Consultation & Evaluation

Medical History, Physical Exam, Hormone Tests, Ultrasound



Ovarian Stimulation

Daily Hormonal Injections to Stimulate Multiple Egg Growth

Monitoring via Ultrasound and Blood Tests



Final Maturation Trigger

hCG or GnRH Trigger Injection Given Once Follicles are Mature



Egg Retrieval (Ovum Pick-Up)

Performed 34-36 Hours After Trigger Under Anesthesia



Semen Collection

On Same Day as Egg Retrieval

Sperm Processed and Selected for Injection



ICSI (Intracytoplasmic Sperm Injection)

A Single Sperm is Injected into Each Mature Egg



Embryo Culture

Fertilized Eggs (Embryos) are Cultured for 3–5 Days



Embryo Transfer

1 or 2 Embryos Transferred into Uterus Using a Catheter

→ Done Under Ultrasound Guidance



Luteal Phase Support

Progesterone Supplementation to Support Implantation



Pregnancy Test

Beta hCG Test After 14 Days

Early pregnancy scan to Confirm Clinical Pregnancy

Financial Counseling

Mrs. Lakshmigayathri was provided with a transparent cost estimate for the complete **IVF with ICSI treatment cycle**, broken down into structured steps. The procedure involves multiple phases and associated expenses.

➤ *Total Estimated Cost Range: ₹3,00,000 – ₹3,20,000*

(Depending on individual response to treatment and medication requirement)

Cost Structure Breakdown

Stage	Details	Cost (INR)
Step 1: TVOR + ICSI Procedure	Egg retrieval under general anesthesia and ICSI fertilization	₹1,20,000
Step 2: Embryo Cryopreservation	Freezing of viable embryos and storage for 1 year	₹30,000
Step 3: Frozen Embryo Transfer	Preparation cycle, embryo thawing, and transfer	₹45,000
Additional Charges:	Scans, blood tests, hormone profile, consultations, consumables, medications, and injections	₹85,000 – ₹1,20,000

Insurance/Reimbursement Policy

- Standard health insurance typically **does not cover IVF procedures** under cashless schemes.
- **Corporate policies** may allow **partial reimbursement**, based on prior approvals.
- The hospital will provide detailed **invoices, discharge summaries, and treatment plans** to support claim submission if applicable.

Patient Queries and Counseling Provided

1. What is the success rate and chance of pregnancy with IVF-ICSI?

- IVF success decreases with age, especially after 35.
- At age 39, the average success rate per IVF cycle ranges between **20–25%**, though this may vary depending on:

- Number and quality of retrieved eggs
- Embryo quality
- Endometrial receptivity

✓ *Mrs. Lakshmigayathri was counseled that while success rates decline with age, IVF with ICSI offers the best possible chance of conception in her case.*

2. What are the risks and side effects of IVF-ICSI?

- **Common Side Effects:**
 - Bloating, mood changes, injection site pain
 - Mild abdominal discomfort after egg retrieval
- **Possible Complications:**
 - Ovarian Hyperstimulation Syndrome (OHSS)
 - Multiple pregnancy (if multiple embryos are transferred)
 - Rare risk of infection or bleeding post-procedure

✓ *Minimal stimulation protocol and close monitoring were planned to reduce OHSS risk.*

3. What are the post-procedure instructions?

- Rest is advised for 24–48 hours post embryo transfer
- Continue **prescribed progesterone** without fail
- Avoid heavy lifting, strenuous activities, or intercourse for 10–14 days
- Emotional and mental wellness is encouraged
- Return for **beta-hCG test after 14 days**
- Do not stop medications unless advised by the fertility specialist

✓ *Patient was provided a written instruction sheet for post-ET care.*

4. Is IVF-ICSI covered under insurance (cashless or reimbursement)?

- Most standard insurance policies **do not cover IVF procedures**, especially under cashless modes
- Some corporate or premium policies may offer **partial reimbursement** after prior authorization
- Full documentation, bills, and medical justification letters will be provided if required for claim processing

✓ *Patient was advised to consult with her employer's HR or insurance TPA.*