



A Successful ART Treatment of Severe Asthenoteratozoospermia with Donor Sperms: A Case Study at Wardha Test Tube Baby Centre, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Introduction: Approximately about 15%-20% of couples are affected by infertility. By the means of diagnosis and treatment both the partners male and female must be evaluated simultaneously, since male contributes as a factor for infertility in 40-60%. The primary step to diagnose male's infertility in any case scenario is qualitative semen analysis. Urological evaluation and physical examination of male should be carried out as there are many factors which can affect semen quality. Widely, in assisted reproductive technology (ART) treatment, couples diagnosed with grievous male infertility (Non-Obstructive Azoospermia/OATz syndrome) as well as female patient deprived of male partners eager to have pregnancy are recommended to opt cryo-preserved donor spermatozoa.

Main symptoms and important clinical findings: Qualitative semen analysis showed poor motility (94%-96% Immotility) and morphology (98% abnormality).

The main diagnoses, therapeutic interventions, and outcomes: The couple was diagnosed with male factor infertility (Asthenoteratozoospermia), the couple was counselled and suggested for treatment of Intracytoplasmic Sperm Insemination with self-oocytes and donor sperms and Freeze all strategy for embryo transfer. Wife conceived in first treatment cycle.

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Conclusion: Frozen embryo transfer of O3 Grade A day 4 morula was done in March 2020, and patient conceived in 1st cycle. Later in November 2020 couple was blessed with a baby girl.

Keywords: Asthenoteratozoospermia; donor sperm; fertilization; ICSI; insemination; pregnancy.

1. INTRODUCTION

Approximately 15%-20% of couples are affected by infertility. By the means of diagnosis and treatment both the partners male and female must be evaluated simultaneously, since male contributes as a factor for infertility in 40-60% [1]. The primary step to diagnose male's infertility in any case scenario is semen analysis. Urological evaluation and physical examination of the male should be carried out as there are many factors which can affect semen quality, and also trim to exclude the genetic, anatomical abnormalities, varicocele and endocrinology disorders. Even acquiring complete patient's current timeline urological evaluation and physical examination data, it is obligatory to include the history of any previous testicular trauma, hernia, cryptorchidism or any surgery at genital; or history of acquaintance to heat and working in extreme or harsh environmental settings and even history of consumption of explicit medicines [2]. Divulging to heavy metal such as lead, mercury and pesticides could affect the semen parameters of male [3]. Other factors affecting male fertility also includes psychological stress and acquaintance to radiations ionizing as well as non-ionizing radiation [4].

Widely, in assisted reproductive technology (ART) treatment, couples severely diagnosed by male infertility (Non-Obstructive-Azoospermia/Oligo-Astheno-Teratozoospermia syndrome) as well as females starved of male partners eager for pregnancy are recommended intended to use cryo-preserved donor spermatozoa. When compared to traditional insemination method, a rise in fertilization rate and pregnancy rate has been seen with using donor spermatozoa [5].

In ART treatment procedure, embryo transfer could be achieved by either fresh or frozen-thawed embryos [6]. Thus, approaches for embryo transfer in ART treatment procedure include , the orthodox approach of a single transfer of fresh then one or more transfers of frozen-thawed embryos or transfer of solitary frozen-thawed embryos only i.e., "Freeze-All" strategy [7]. Evidently, there is a difference between both embryo transfer strategies in the

procedure for vitrification, cryopreservation and timing of transfer. Transfer procedure is removed from the ovarian stimulation cycle in the freeze-all strategy. As ovarian hyperstimulation is suggested to have a negative effect on the receptivity of the endometrium for embryo implantation, freeze-all strategy is favorable. The risk of Ovarian Hyperstimulation Syndrome as a complication is lower in a freeze-all strategy for the reason that pregnancies do not ensue in the stimulated cycle [8].

This case report presents a couple with primary infertility for six years, diagnosed with male-factor infertility (Asthenoteratozoospermia) and managed with intracytoplasmic sperm injection (ICSI) using donor sperm sample and freeze-all embryo transfer strategy at Wardha Test Tube Baby center, Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha.

2. PATIENT INFORMATION

Patient specific information: Subject of study is a Couple, wife 25 years old and husband 28 years old, from Amboda, Akola, Maharashtra; attended Wardha Test Tube Baby Center at Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha in January 2020. Wife was a housewife had no alcoholic and tobacco habits, while husband was a farmer and was small-scale business owner too. He was chronic alcoholic and tobacco smoker.

Primary concerns and symptoms of the patient: Couple was case of primary infertility and was eager to conceive for 6 years, their duration of marriage was 7 years.

Medical History: Both husband and wife had no history of Diabetes, Hypertension, Tuberculosis, Asthma, Epilepsy and thyroid diseases. Also, had no history of any major illness in the past; no history of blood transfusion and hospitalisation in the past. Husband has no history of trauma, surgery, hernia and undescended Testes.

Family History: There was no family history of Diabetes, Hypertension, Tuberculosis, Asthma, Epilepsy and thyroid diseases. Also, no history of any chronic diseases and infertility from either side of concern couple.

Psycho-social history: Couple had no history of any behavioural disorder, Psychiatric illness and other mental or economic stress.

Relevant past interventions with outcomes: Couple had taken treatment for infertility at some Private infertility clinic in Akola and had history of one IUI failure. (No document was available to mention data)

Clinical Findings:

On general examination of Female-

General condition was good, afebrile on touch
Pulse was 82/min
Bp-110/70 mm/hg
No pallor and edema
Her weight- 56 kgs height- 5'1
Her BMI-23.3

On general examination of Male-

Pulse was 82/min
Bp-110/70 mm/hg
His weight- 70 kgs height- 5'7
His BMI- 22.9

Systemic Examination:

Cardiac Vascular system- S₁S₁ present, no murmur heard
Respiratory System- Bilateral air entry present and clear chest;
Central Nervous System- Conscious and oriented to time, place and person.
Musculoskeletal system-no abnormality detected

Significant physical examination (PE) and important clinical findings: Per abdominal examination - soft, non-tender; no mass palpable.

Gynaecological examination – Per speculum examination- Healthy Cervix and Vagina;
Per vaginal examination- Uterus was of normal size;
Anteverted anteflexed, Bilateral Fornices free and non-tender.

Case presentation: A couple who presented to Wardha Test Tube Baby center in January, 2020 with a history of primary infertility and one failed intrauterine insemination (IUI) and where diagnosed of male-factor infertility. Both wife and husband showed normal clinical findings on general physical examination and significant systemic examination.

Investigations

Female:

- CBC: 13.7 mg%

- Hb: 13.2 mg/decilitre
- WBC: 9600 cells/cm³
- Platelets: 3.97 lacks
- Liver Function Test- Normal
- Kidney Function Test- Normal
- HIV: Non-Reactive
- HBsAG: Non-Reactive
- HCV: Non-Reactive
- VDRL: Non-Reactive
- Anti-Mullerian Hormone (AMH) Test: 5.6
- Antral Follicle Count (AFC): 12
- Hysterosalpingography (HSG) test: Uterine cavity normal, normal fallopian tubes bilaterally , free spillage of dye seen.

Investigations (Male):

- CBC: 15.7 mg%
- Hb: 14.0 mg/decilitre
- WBC: 15000 cells/cm³
- Platelets: 3.97 lacks
- Liver Function Test: Normal
- Kidney Function Test: Normal
- HIV: Non-Reactive
- HBsAG: Non-Reactive
- HCV: Non-Reactive
- VDRL: Non-Reactive

Semen Analysis Report:

- Sperm Count: 20 million/ml
- Sperm Total Motility: 4-6%
- Sperm Morphology: 98% abnormality

Diagnostic challenges: No challenges were reported.

Diagnosis: Male-factor infertility. Husband's Semen Analysis showed severe asthenoteratozoospermia with total motility of 4-6% and 98% morphologically abnormal sperms.

Prognosis: This case had a good prognosis as treatment with intracytoplasmic sperm injection of self-oocytes using donor sperms, with a freeze-all strategy had shown positive results many times back in time at Wardha Test Tube Baby Center.

Therapeutic Intervention: Couple were counselled and offered treatment with intracytoplasmic sperm injection of self-oocytes using donor sperms and a freeze-all strategy for embryo transfer.

Administration of therapeutic intervention:

Twelve days prior to oocyte retrieval procedure, ovarian stimulation was done with short antagonist protocol, in which Human Menopausal Gonadotropin (Inj. HMG) 300 IU was given for 10 days from 6th day, Inj. Cetrorelix acetate 0.25mg was commenced for four days and on 10th day Human chorionic gonadotropin (HCG) trigger was given.

Oocyte retrieval was done in January 2020; a total of 14 oocytes were retrieved out of which twelve were MII and two were MI and intracytoplasmic sperm injection was done with donor sperms (Sperm-count: 40 million/ml; Progressive motility: 75%). By day 4, five morulae were formed (3 x Grade A; 1 x Grade B; and 1 x Grade C/D) which were then frozen. frozen-thawed embryo transfer of 03 Grade A; day 4 morulae was done in March 2020 and patient conceived in the 1st cycle. Later in November 2020, the couple were blessed with a baby girl.

Important procedural monitoring: Routine intermittent monitoring was done during ovarian stimulation and size of follicles were observed gradually. During the process of frozen-thawed embryo Transfer, patient's endometrial thickness and vascularity was assessed. After fourteen days of embryo transfer, β -hCG test report came positive. (β -hCG = 1000).

Adverse and unanticipated events: Out of five frozen day 4 morulae, two embryos of Grade B and C/D didn't recover cleanly after thawing and thus were discarded, 3 day 4 morulae of grade A were used for Frozen-thawed Embryo Transfer.

3. DISCUSSION

A lot of stress, grief and sadness had been caused among many men and women due to infertility. In infertility treatment, it may stand easier for the couples who will be treated with their own gametes to make the decision to agree to the treatment procedure and the waiting time before treatment could also be much shorter. On the other hand, reluctance to receive treatment in a donation program has been observed mostly among couples diagnosed with severe male-factor or female-factor infertility. However, in some cases, the couples easily accept a donor program [9]. Banerjee and Singla from Advance Fertility and Gynaecology centre conducted a cross-sectional study at Delhi, India, in which they aimed to assess the attitude toward oocyte,

sperms, and embryo donation amidst couples facing infertility in India. From 1st October 2015 till 31st December 2015, a total of 594 couples having infertility were evaluated via a structured questionnaire given to couples having infertility. They concluded that out of 594 couples about 55% of female partners and 83% of male partners agreed for donor oocytes, sperms and embryos [9-12].

This was a case of male-factor infertility with a diagnosis of severe asthenoteratozoospermia and the couple accepted donor treatment without much hesitation. In many cases, no precise treatment is offered to improve sperm quality when severe oligoasthenoteratozoospermia is diagnosed. Evidently, several infertility treatment procedures particularly intracytoplasmic sperm injection (ICSI) with donor sperms are increasingly being used. Nevertheless, to evade gratuitous therapies, a precise diagnosis should be made. Gonadotropin deficiency is a rare cause of male-factor infertility, accounting for less than 1% of all cases. Instances of gonadotropin suppression may occur in a number of cases and very seldomly, excessive adrenal steroid production underlies the inhibition of the hypothalamic-pituitary axis, resulting in failure of normal testicular maturation.

Generally speaking, ART treatment procedure denotes a single fresh and one or more than one frozen-thawed embryo transfers. While on the other hand, the 'freeze-all' approach points toward transfer of only frozen-thawed embryos. When it comes down to practicality, both approaches could differ in technicality together with variances in vitrification practices as well as cryopreservation timing and transfer. That is, vitrification versus slow freezing, day 1 versus day 3 embryos versus day 5 blastocysts and transfer of day 3 or day 4 embryos versus day 5 blastocysts [6]. Transfer procedure are removed from the ovarian stimulation cycle in the freeze-all strategy. By the means of suggestion of the ovarian hyperstimulation to have a negative effect on the receptivity of the endometrium for embryo implantation, freeze-all strategy is favourable. The jeopardy of *Ovarian hyperstimulation syndrome* has being lowered in freeze-all strategy for the reason that pregnancies do not ensue in the cycle with ovarian stimulation [10].

Wang et al aimed to identify the predictors of poor outcomes in ART treatment by AID (Artificial Insemination with Donor Sperms) and

also to determine the lower threshold that might hint on transformation to fertilization by ICSI instead of insemination. In this retrospective study, age-matched women were selected as cases and controls. There were 69 women undergoing fresh IVF cycles with self-oocytes, fertilized by insemination with donor spermatozoa as cases and 138 cohorts fertilized using freshly ejaculated spermatozoa from their partners as controls. Wang et al concluded that, IVF with donor sperms resulted in alike fertilization and pregnancy rates $\geq 88\%$ equated to those of freshly ejaculated sperms $\leq 88\%$ [5]. Few studies reflected on different aspects of male infertility and associated factors [13-19].

4. CONCLUSION

Many perceptible and imperceptible losses occur with couples diagnosed with infertility, thus forms a life crisis situation for them. Though, in India, the affirmation of donor gametes; also, donor embryos in couples with infertility is still low-slung, treatment with donor programme helps them to get rid of mental stress of infertility problem. In this case, frozen embryo transfer of 03 Grade A day 4 morula was done in March 2020, and patient conceived in 1st cycle. Later in November 2020 couple was blessed with a baby girl.

CONSENT

To ensure confidentiality patients information was de-identified. An informed consent for all procedures such as, oocyte retrieval, intracytoplasmic sperm injection using donor sperm sample, embryo freezing, embryo thawing and frozen-thawed embryo transfer was taken prior to the procedure.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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