Original Article

In-Vitro Fertilization: A Study At Rural ART Clinic

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Abstract

Introduction:

There is an increase in Stipulation as well as the necessity for Assisted Reproductive Technologies (ART) treatment, gradually day by day, various studies are being conducted to develop tactics to decrease the expense of infertility treatment procedures, that's known to be the most vital issue from patient's side. Examining the demand this study focuses on the social-economic status of the couples undergoing ART treatment and treatment cost in wardha test tube baby centre Maharashtra collate with other countries IVF treatment cost. Out of 69 included patients, for females age varied from 23 to 56 years whereas in the case of males the age varied in the range of 26 to 50 years and their annual income was wide-ranging from USD 4330 per annum to USD 17318 per annum. About 58% of patients availing of treatment existed within the Wardha region. Primary infertility was observed as a concerning symptom in 84% study population out of 69. On the whole, most patients went through IVF-ICSI with oocyte donation 45%, and about 31% of patients went through IVF-ICSI with self-gametes. At the end of treatment, a total 42% of all had positive pregnancy tests (β-hCG). This study gives idea about patients with different infertility factors i.e., either male/female factor or unexplained infertility and basic idea about cost of IVF cycles in different areas of India. This study becomes useful for couples to explore different costs of treatments of infertility ie. cost of ART cycles, medications and complications after IVF/ICSI cycles.

Keywords: Invitro Fertilization; Infertility; Socio Economic Status.

Introduction

ART or Assisted Reproductive Technology has shown great growth in the past few years. In 1978, the birth of Louise Brown the first IVF baby was positive indication to developed this technique for the couples who are dealing with infertility. Art actually does not heal the infertility but able to make lots of infertile couples to have child by their own [(1)].

Assisted reproductive technologies (Art) is now moderately better possible choice to couples having infertility from growing countries. Although with development in economic many couples going through infertility can now meet the expense of this advance treatment. This leads to increase in numbers of ART clinics throughout the world[2].

Every year approximately 60 to 80 million couples are unable to conceive naturally after regular period of unprotected intercourse. Nearly around 15 – 20 million couples are from India itself [3]. Worldwide nearly 7 million children still now born with this advance treatment like ART [4].

The real number is much more greater as many of the art clinics around the world are not registered such as ICMRT (International Committee for Monitoring Progress in Assisted Reproduction)

As time has passed the techniques has been modern with new medication and apparatus. The intra- cytoplasmic sperm injection (ICSI) the advanced developing technique in ART has brought greater interest in the achievement of IVF (in vitro fertilization) process. The number of positive inception of pregnancy per attempt has be surely increases in the past decade. In 1978 july, the birth of Louise brown , the first documented ivf baby, afterwards dr. Subhas Mukherjee from Kolkata declare the world's next (second)ivf baby 'durga' , in the same year of October. The first scientifically documented ivf baby was born in 1986 'harsha' , in (NIRRH) National Institute for Research in Reproductive Health, Mumbai government research programme [5][6].

Since then india has develop high and results in ivf treatment has attracted the attention of couples those are childless all over the globe. The great development in ART clinics and the number of ivf cycles continuously rising over last decade in field probably recorded in India[7].

This ART treatment is quite expensive so as there are still many couples those are unable to get this treatment. The overpriced of ART treatment is the major problem that stop many couples to get profit of this advance and developing technology to help couples to have children by their own[8].

Whereas the expenses of Assisted Reproductive Technology (ART) treatment is vary between the different part of globe, however it is an high cost treatment mostly all over the world.

In the field of fertility there is no normalization of prices and cost of different procedures like intrauterine insemination (IUI), intra cytoplasmic sperm injection (ICSI) and in vitro fertilization (IVF) varies greatly within India [9]. Although the prices of ART procedures vary in different part of world, it is mainly a expensive technique in almost different parts of globe.

In meeting entiltled 'Medical, Ethical and Social Aspects of Assisted Reproduction' organized by WHO , World Health Organization in 2001 , recognise that there is cost-effective ART treatments for persons of poorer social financial group and proposed the following measures:

- All over the world the infertility should be taken as community health subject.
- Infertility and necessity of infertile couples should be taken under consideration by policy makers and health staff.
- ART, assisted Reproduction Treatment must be complementary.
- Infertility organization must be combined into nation-wide reproductive health training platforms and facilities.

There is increase in necessity and also demand of ART, Assisted Reproductive technologies in current ages, there is growth in searching policies to decrease the expensive of IVF procedures, which are known to be most significant issue from patient's sideways. Examining the demand this study focus on the social economic status of the couples undergoing ART treatment and treatment cost in wardha test tube baby centre Maharashtra compare with other countries ivf treatment cost.

Methodology

During the span of August 2019 to August 2020 examination of the records of 69 patients was done who visited Wardha Test Tube Baby Center, at Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha in this retrospective, cross-sectional study. Clinic's register and patient's file, and verbal answers to structured questionnaire given by infertile couple at the time of their visit to the Centre were used for data collection for cross-sectional study. As per standard guidelines, this centre has a team of a fertility consultant (Gynaecologist), a senior and junior embryologist, nurses, a lab technician, a therapist and five post graduate students (M.Sc. Clinical Embryology). ART treatment details of the center was gathered by the means of clinic register as well as from patient's files, and verbal answers to structured questionnaire helped to gather the socio-economic details from patients availing the treatment at center. Among 86, there were seventeen unanswered questionnaires. In the long run, the questionnaires and the data for 69 patients were available to include and then was analysed. The study includes couples, undergoing ART treatment like, IVF-ICSI with self-gametes, IVF-ICSI ovum donation, IVF-ICSI with donor sperms, embryo donation and frozen embryo transfer. The inclusion criteria for the study also have, the expense of ART treatment procedure relied on the unswerving medicational expenses of IVF-ICSI cycles. For easy comparison and understanding value of treatment was being considered in (1 USD = 69.29 INR Dollar price level 01.08.2019). Exclusion factor for the study were; Indirect expenses of patients such as cost of travelling, losing of waged days and following loss of wages for daily, diagnostic work-up expenses and also post-conception requirements and charges. Only expense for one cycle of IVF treatment was being mentioned in this study. In this study, the assessment of valuation for pregnancy outcome and if positive, additional examination and cost for supportive hormonal treatment were also excluded.

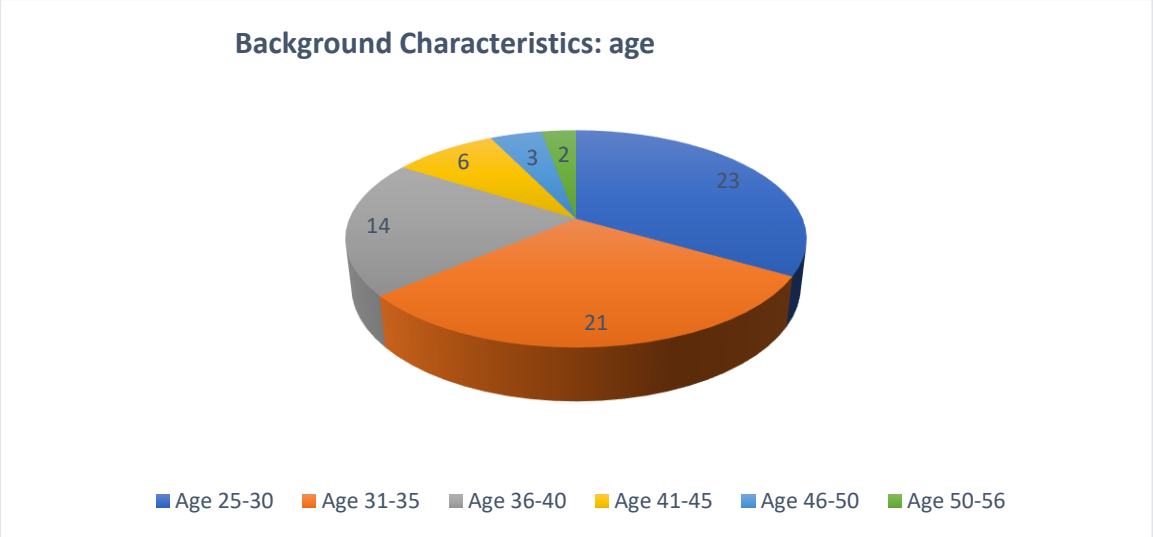
Result

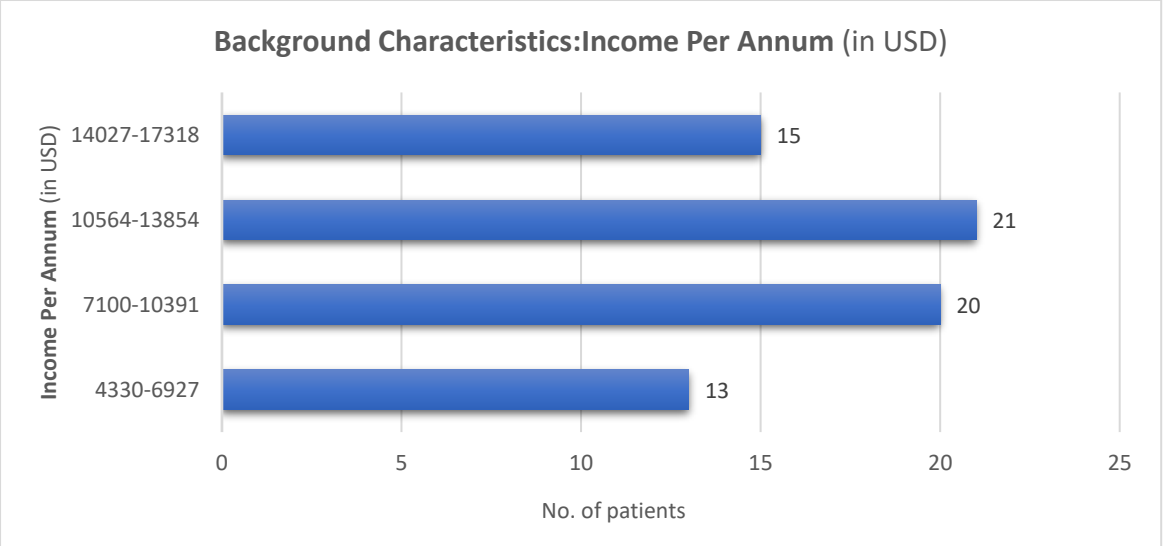
Out of 69 included patients, females age varied from 23 to 56 years and males age varied from 26 to 50 years. Their income differed from USD 4330 per annum to USD 17318 per annum. Around 58 % of the patients availing treatment were from Wardha region. The preferable characteristics of the patients are showed in Table.1. Among 69, 84% patients were having primary infertility. Among total patients, the maximum number of the patients went through IVF-ICSI with oocyte donation 45%, and about 31% of patients went through IVF-ICSI with self-gametes. After the treatment, 42% of them had pregnancy test (beta-hCG) positive. The treatment-correlated factors of the patients are showed in Table.2. Estimated expenditure of a single IVF cycle with self-gametes valued USD 1,298 to USD 1,443. For IVF cycle with oocyte donation, was USD 1,515 and embryo donation were as low cost as USD 606 to USD 808. Vitrification of extra embryos charged only USD 144 and frozen embryo transfer (FET) cycles cost only USD 288. Therapy's cost was reduced as the hospital and ART clinic is located in rural region which makes this high cost treatment accessible to financially weak patients. In a fresh IVF cycle, the hormone injection's cost is around 55%-60% of the expenditure of total cycle.

Table.1: Percentile distribution of patients with Background characteristics

Background Characteristics		**No.**	**Percentile**
Age	25-30	23	27.43
	31-35	21	33.42
	36-40	14	37.92
	41-45	6	44.16
	46-50	3	47
	50-56	2	54
Income Per Annum	4330-6927	13	8.97
	7100-10391	20	13.8

(In USD)	10564-13854	21	14.49
	14027-17318	15	10.35
Place of residence	From Wardha	40	57.97
	Not from Wardha	29	42.02





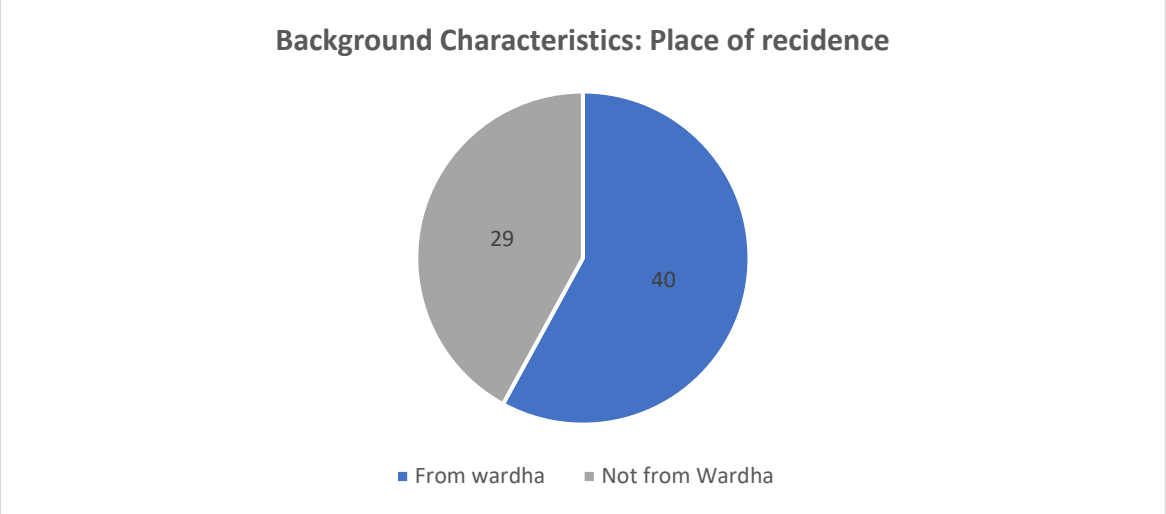
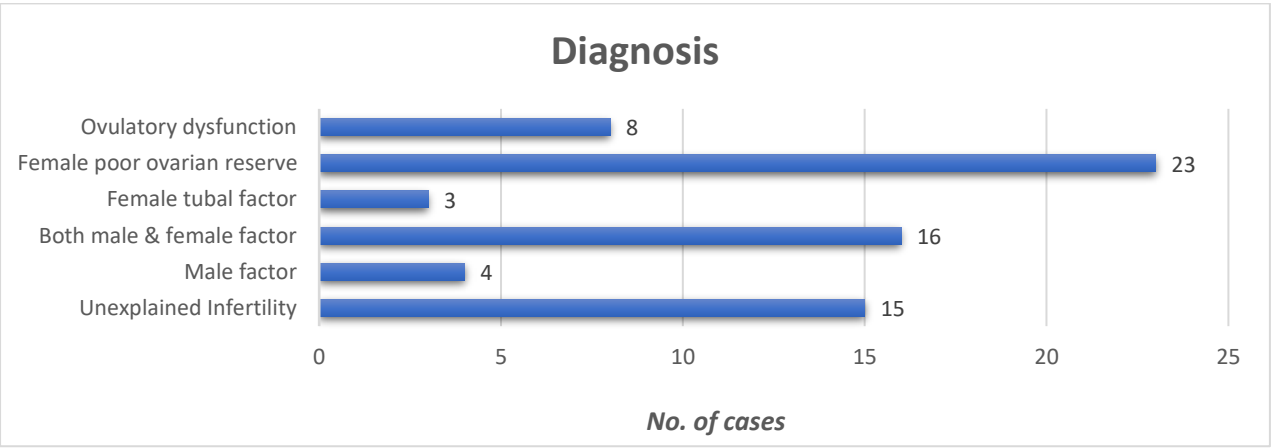
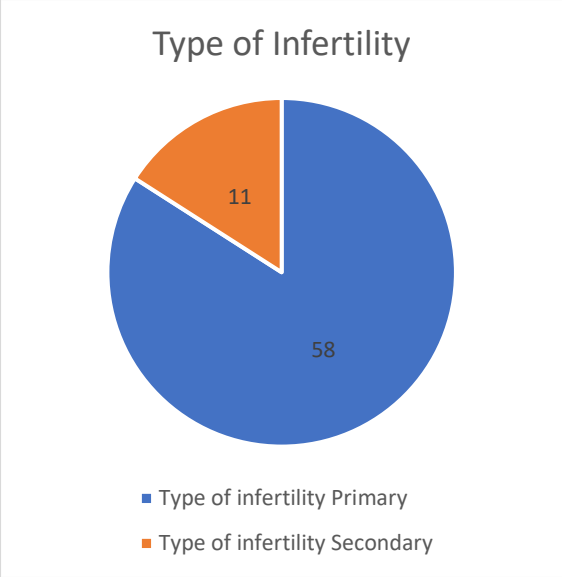
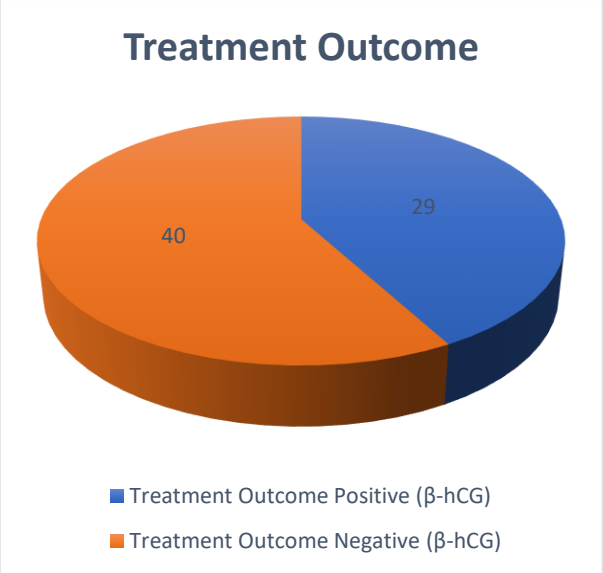


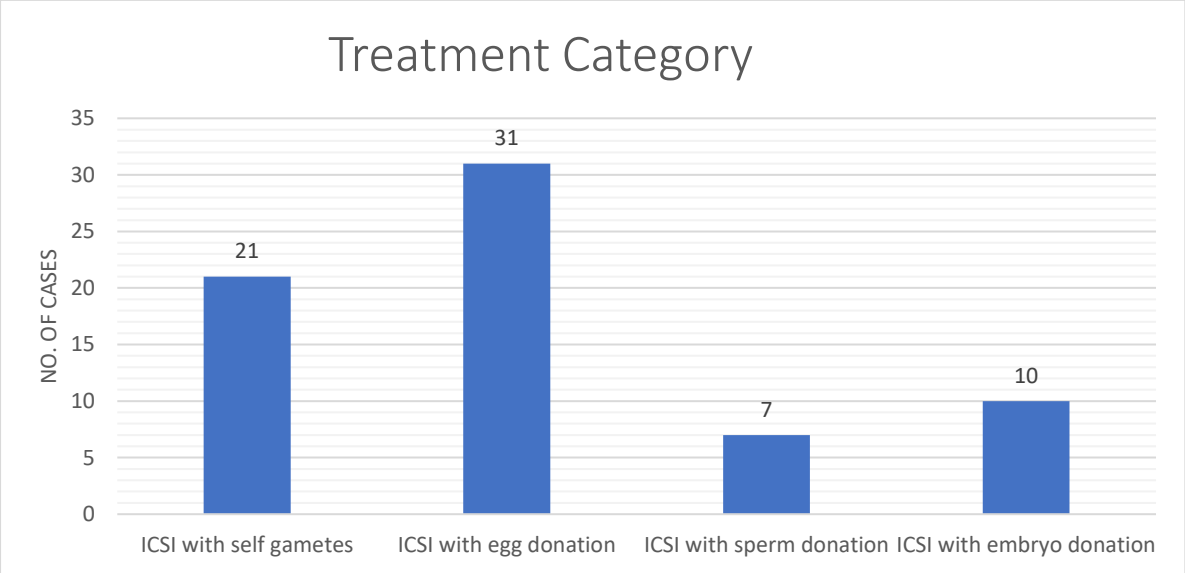
Table.2: Patient's distribution in percentile with factors related to treatment.

Factors related to Treatment		**No.**	**Percentile**
Diagnosis	Unexplained Infertility	15	10.35
	Male factor	4	2.76
	Both male & female factor	16	11.04
	Female tubal factor	3	2.07
	Female poor ovarian reserve	23	15.87
	Ovulatory dysfunction	8	5.52
Type of infertility	Primary	58	84.05
	Secondary	11	15.94
Treatment category	ICSI with self gametes	21	30.43
	ICSI with egg donation	31	44.92
	ICSI with sperm donation	7	4.83
	ICSI with embryo donation	10	6.9
Treatment Outcome	Positive (β-hCG)	29	42.02
	Negative (β-hCG)	40	57.97
N			**69**









Some Case study scenario;

Case I

Preliminary Information:

A couple, wife 29 years & husband 32 years having primary infertility of 10 years came to WTTBC. Wife had poor ovarian reserve; husband's semen analysis showed sever Oligoteratozoospermia.

Recommendation:

Patient was advised for ICSI with donor oocytes, which almost costs 15,15.37 USD (105000 INR). As patient was unable to afford the single oocyte donation treatment, oocyte sharing cycle was suggested to them.

Follow up:

Patient's first cycle was a failure due to poor endometrium thickness. PRP treatment was suggested to increase endometrium thickness. Patient conceived in second attempt. USG showed foetal activity and clinical pregnancy

was confirmed. After completion of gestational period, healthy twin male babies were delivered. Now they are happy parents.

Case II

Preliminary Information:

A couple, wife, 23 years and husband 30 years visited WTTBC having primary infertility of 1 ½ years. Wife had PCOD. Husband's semen analysis showed normal sperm count. Husband had history of Sickle cell anaemia (SS pattern). Wife showed Sickle cell anaemia (AS pattern) in late phase.

Recommendation:

Couple was advised for ICSI with donor sperm, which almost valued 1443.20 USD (100000 INR).

Follow up:

In first cycle wife was conceived and USG report showed presence of normal gest sac. Patient is having her ongoing pregnancy.

Case III

Preliminary Information:

A wife aged 31 years old and 42 years old husband having symptom of primary infertility for 14 years visited WTTBC. Wife had normal ovarian reserve and husband's semen analysis showed Oligozoospermia.

Recommendation:

Couple was suggested for ICSI with self-gametes which costs about 1298.88 USD (90000 INR).

Follow up:

First cycle showed β-hCG negative. Wife conceived in second cycle and USG showed normal gest sac and foetal activity. After completion of gestational period, the couple was blessed with healthy twin babies.

Discussion

The number of ART clinics reporting their data to ISAR has been increased from 2016 to 2020 with increasing number of ART cycles which leads to increment in positive outcomes. This rise in number of ART cycles is largely due to rise in number of ART clinics with increase in IVF/ICSI cycles in INDIA. The upsurge in number of clinics and ART cycles has been enormously rising in INDIA. This is due to rise in awareness among the clinicians about importance of their data. This will allow clinicians to use their data in field of research.

The data represented in this case report is efficient and covers the importance of IVF/ICSI. This is a reflective, cross-sectional study, which examined the data of 69 couples who came to Wardha Test Tube Baby Centre, at Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha during the phase of August 2019 to August 2020. An entire number of 69 couples, women were 23–56 year old and men were 26–50 year old. In this review, Primary infertility was mostly observed in infertile couples. Almost 58% of the couples were suffering with primary infertility, whereas 11% of them were dealing from secondary infertility. In this review, female poor ovarian reserve factor had highest percentage as compared to male factors. Comparatively huge variance may be correlated to diverse circumstances which might lead to infertility. In this review, ovulatory dysfunction has been stated as a female cause for infertility. Although ovulatory dysfunction may be due to PCOD/PCOS which supress the ovulation in females that may be one of the factors causing infertility. Also, this case study shows major cause of infertility is with male factors; includes varicocele, oligozoospermia and asthenozoospermia. Couples with unexplained infertility and both male and female infertility were also seen. Only ICSI, ICSI with self-gametes, egg donation, sperm donation and embryo donation were included. This ART treatment is quite expensive so as

there are still many couples those are unable to get this treatment. The overpriced of ART treatment is the major problem that stop many couples to get benefit from advance treatment like ART to aid them to get pregnant.

Whereas the charges of ART technology is different between various regions, however it is an costly procedure mostly in all regions of globe. The difference was observed while comparing the correspondent charge of IVF treatment in India with other countries in the world.[10] The charge of an IVF treatment in the Netherlands was USD 3,938. [11-20] In Sweden, the charges extended from USD 4,890 to USD 5,993. [12, 13,14] In the UK, A solitary, fresh IVF cycle would charge between USD 3,390 and USD 4,236. [15, 16]. Oocyte donor cycles usually charge even more. The expenses of medicines used for ART treatment which are made in India are accessible at low price as compared to other countries. Infertility centres at established level have less cost of treatment in India. Discussing the case highlights some main issues of the patient i.e., firstly the treatment charges , psychological and emotional stress and difficulties faced before and after the IVF/ICSI treatment. According our review outcomes, the discussion underlines three main concerns: the treatment charges, emotional stress and problems related to IVF/ICSI. The charge of one IVF cycle with self gametes is around USD 1,298 to USD 1,443. For IVF cycle with oocyte donation, was USD 1,515 and embryo donation were as less as USD 606 to USD 808. Vitrification of extra embryos charged only USD 144 and frozen embryo transfer (FET) cycles charged USD 288. Charge of treatment was reduced as the hospital and ART clinic is located in rural region. It makes this costly treatment accessible to financially weak patients. The charge of hormone injection is 55%-60% of the total cost in a fresh IVF cycle.

This prospective cross-sectional study at Wardha Test Tube Baby Centre, at Acharya Vinoba Bhave Rural Hospital, Sawangi, Wardha during the phase of August 2019 to August 2020 shows; Out of 69 included patients, for females, age varied from 23 to 56 years. For males age varied from 26 to 50 years. Their income wide-ranged from USD 4330 per annum to 17318 per annum. Around 58 % of the population availing treatment were from Wardha region. Table.1 below states preferable characteristics of patients. From 69, 84% patients had primary infertility. From total patients, the highest number of the patients went through IVF-ICSI with oocyte donation 45%, and about 31% of patients went through IVF-ICSI with self-gametes. After the treatment, 42% of patients showed positive clinical pregnancy. The treatment-correlated factors of the patients are showed in Table.2. The charge of one IVF cycle with self gametes is 1298 USD to 1443 USD. For IVF cycle with oocyte donation , was USD 1,515 and donation of enbryo were as less as USD 606 to USD 808. Vitrification of extra embryos charged USD 144 and frozen embryo transfer (FET) cycles charged USD 288. Charge of treatment was reduced as the hospital and ART clinic is located in rural region. It makes this costly treatment accessible to financially weak patients. The charge of hormone injection is 55%-60% of the total cost in a fresh IVF cycle. Data also shows large number of cases undergoing ICSI with egg donation i.e., large number of females having poor ovarian reserve, whereas few of couples undergoing ICSI with self-gametes, sperm donation and embryo donation. Data shows 29% of B HCG positive patients and 40% B HCG negative patients[21-31].

Conclusion:

Infertility is considered as a widespread problem in our communities particularly among women's who delay the childbirth lately from their reproductive age. This becomes alarming trend of infertility for women. A major part of infertility is due to ecological situations and assimilated peril issues. Different risk factors and ecological factors related to infertility need to be studied from different areas. Indian organizations should increase work for development of IVF at much low cost and make it affordable for the couples that are in necessity of ART treatment with restricted assets. This will allow rise in IVF cycles across different ART clinics in INDIA. However, this study gives idea about patients with different infertility factors i.e., either male/female factor or unexplained infertility and basic idea about cost of IVF cycles in different areas of India. This study becomes useful for couples to explore different costs of infertility treatment i.e charges of ART cycles, medications and complications after IVF/ICSI cycles.

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