Outcome of IVF Treatment of Couples Attending the HOPE and Lab Aid IVF Clinic, Dhaka

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ABSTRACT

Background & objective: Infertility is a major reproductive health issue affecting millions of couples globally, with significant psychological and social implications. Estimates suggest that 15% of couples experience infertility in South Asia, including Bangladesh. Despite advances in assisted reproductive technologies (ART), particularly in vitro fertilization (IVF), there is a lack of comprehensive data on the demographics and clinical characteristics of couples seeking these services in Bangladesh. This study aimed to evaluate the demographic and clinical profiles of couples undergoing IVF treatment at IVF Clinics in Dhaka to assess the treatment outcomes.

Methods: This cross-sectional observational study was conducted from January to December 2024, enrolling 126 couples aged 18 to 45 years seeking IVF due to primary or secondary infertility. Participants completed a structured questionnaire capturing demographic information, infertility history, clinical assessments, and IVF treatment protocols. Couples were excluded if they had anatomical abnormalities requiring surgical intervention, previous IVF treatment at another facility, or significant medical comorbidities. Data analysis involved descriptive statistics to summarize demographic and clinical characteristics, and outcomes such as clinical pregnancy rates and live birth rates were recorded.

Results: The study revealed that participants had a mean age of 32.6 years, with approximately 40% aged 20 to 30 years and 41.3% aged between 30 and 40 years. Over 70% of participants experienced primary infertility, with the average duration of infertility being 8.9 ± 4.4 years. Common reasons for delaying IVF included a lack of knowledge (44.4%) and inadequate resources (23.8%). Following IVF, the overall pregnancy test positivity rate post-IVF was 37%, and more than one-third (35.7%) of cases showed a gestational sac on ultrasound. Over one-third (37.3%) achieved clinical pregnancy, with 21(44.6%) progressing to full-term pregnancies, leading to 19 singleton births and 2 multiple births. Of the conceived cases, there were 13(27.7%) spontaneous abortions and 9(19.1%) instances of blighted ovum. Additionally, 3 cases (6.4%) resulted in preterm labor, and 3(6.4%) were ectopic pregnancies.

Conclusion: This study highlights key demographic and clinical features of couples undergoing IVF treatment in Dhaka, Bangladesh, revealing a high prevalence of primary infertility and significant barriers to accessing IVF due to limited knowledge and resources. While the conception rate is acceptable, the success rates are notably lower than global averages, indicating a need for further research to improve IVF outcomes for couples struggling to conceive.

Key Words: Outcome, IVF treatment, infertile couples etc.

INTRODUCTION:

Infertility is a recognized reproductive health issue that affects millions of couples worldwide, carrying significant psychological ramifications for those affected. The World Health Organization (WHO) estimates that between 60 to 80 million couples are currently experiencing infertility.[1] This issue has escalated to a level where it poses a considerable social and public health concern.[2] In the United States alone, infertility affects around 7.5 million women, with approximately 1 in 8 couples facing challenges in conceiving or maintaining a pregnancy.[3]

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In South Asia, estimates indicate an even higher prevalence, with about 15% of couples in Bangladesh experiencing infertility.[4]

Infertility treatment encompasses a range of approaches tailored to the underlying causes, including medications, surgical interventions, and assisted reproductive technologies (ARTs). Assisted reproductive technologies (ARTs), which include in vitro fertilization (IVF), intrauterine insemination (IUI), are used to aid in achieving pregnancy conception in individuals who are having difficulty doing so with medications and natural methods and there is no anatomical abnormalities (blockages) in the reproductive system to correct with surgery. Of the two methods of ARTs, in vitro fertilization is a particularly successful treatment of infertility. It involves ovarian stimulation with gonadotropin hormones, followed by retrieval of oocytes under sedation with subsequent fertilization by sperm in the laboratory, and the development of embryos in culture before transferring them into the uterus. However, despite its success, IVF is associated with heightened risks of adverse obstetric and perinatal outcomes, including hypertensive disorders of pregnancy, preterm labor, low birth weight, congenital anomalies, and a host of neurodevelopmental disorders.[5-9]

Understanding the demographic and clinical characteristics of couples seeking IVF treatment is essential for enhancing treatment outcomes and addressing the safety concerns linked to IVF pregnancies. Evidence consistently demonstrates that ART singletons experience poorer perinatal outcomes compared to their spontaneously conceived counterparts, underscoring the necessity for clinicians to remain vigilant regarding these risks.[10] Although IVF services have been available in Bangladesh since the mid-1980s, there is a notable absence of comprehensive national data on the demographic and clinical characteristics of couples undergoing IVF treatment. Presently, only four ART centers in the country perform approximately 2,000 IVF cycles annually, primarily within the private sector, and there is no national registry to document ART outcomes. This study aims to investigate the demographic and clinical characteristics of couples

seeking IVF treatment, as well the outcomes of such treatments at the IVF Clinics/Centers, Dhaka, Bangladesh. By addressing this research gap, the study aspires to provide valuable insights that can inform clinical practices and policies aimed at improving IVF success rates and patient care in Bangladesh.

METHODS

This cross-sectional study was designed to evaluate the demographic and clinical characteristics of couples undergoing IVF treatment at the HOPE IVF Clinic and Lab Aid IVF Center in Dhaka, Bangladesh, as well as to assess the outcomes of these treatments. The HOPE IVF Clinic and the Lab Aid IVF Center are private facilities equipped with modern assisted reproductive technology and have provided infertility services for several years, thereby offering a conducive environment for this research. The study population included couples receiving IVF treatment at the above-mentioned study centers between January and December 2024. The research was conducted in compliance with the Declaration of Helsinki, and ethical approval was sought from the Institutional Review Board of the HOPE IVF Clinic and the Lab Aid IVF Center. Informed consent was obtained from all participants prior to data collection, ensuring that they understood the study's purpose, procedures, and any potential risks involved.

Eligible participants comprised male and female partners aged 18 to 45 years seeking IVF treatment due to primary or secondary infertility. Inclusion criteria necessitated that couples had experienced infertility for at least 1 year, or for 6 months if the female partner was aged 35 years or older. Participants were required to complete the essential preliminary assessments (including hormonal tests, semen analysis, and imaging studies) to establish their suitability for IVF treatment, followed by consent to participate in the study. Exclusion criteria encompassed couples diagnosed with anatomical abnormalities (such as uterine anomalies or severe pelvic adhesions) necessitating surgical intervention, those who had undergone previous IVF treatment at another facility, or individuals with significant medical comorbidities that could adversely influence pregnancy outcomes. These conditions included, but

were not limited to, severe uncontrolled endocrine disorders (e.g., diabetes, thyroid disorders), serious cardiovascular or respiratory diseases, autoimmune disorders affecting fertility or pregnancy, psychological issues impacting treatment adherence, and a history of substance abuse affecting fertility treatment or pregnancy outcomes. This rigorous selection process ensured a homogeneous study population suitable for evaluating IVF treatment outcomes while minimizing potential confounding factors.

A total of 126 infertile women (ages 20 to 47 years) were enrolled based on the estimated prevalence of infertility in Bangladesh and the anticipated number of IVF cycles to be performed at the clinic. Data were gathered using a structured questionnaire designed to address relevant demographic, clinical, and treatment-related variables. The questionnaire included variables such as age, educational background, occupation, socioeconomic status, previous pregnancy outcomes, infertility profile (including duration and causes of infertility), medical history (e.g., diabetes mellitus, hypothyroidism), clinical characteristics (e.g., cause of infertility, reproductive hormone levels), indications for IVF, specific treatment protocols (including ovarian stimulation regimens, dosages of gonadotropins, number of oocytes retrieved, and embryos transferred), and IVF outcomes (including clinical pregnancy rates, live birth rates, pregnancy complications, and neonatal outcomes). Data were analyzed using statistical software (SPSS, version 25.0). Descriptive statistics were used to summarize demographic and clinical characteristics. Categorical data were presented as frequencies with corresponding percentages, while continuous data were summarized as means and standard deviations.

RESULTS:

The age distribution of the study participants revealed that approximately 40% of the women were aged 20 to 30 years, 41.3% were between 30 and 40 years, and 19% were aged 40 years or older, with a mean age of 32.6 years (range: 20 to 47 years). In terms of education, 35.7% of the patients had completed Secondary School Certificate (SSC) and 36.5% had completed Higher Secondary Certificate (HSC). Regarding occupational status,

60% of the patients were housewives, while 37.3% were employed in various sectors. Among the husbands, 40% were businessmen and 44.4% were service-holders. The mean duration of marriage was 10.3 ± 5.4 years, and the mean duration of infertility was 8.9 ± 4.4 years. Notably, nearly 80% of the respondents were classified as non-obese, while 20.6% were identified as obese (Table I).

In terms of infertility type, over 70% of the patients experienced primary infertility, while 28.6% had secondary infertility. The mean age at which IVF treatment commenced was 32.4 ± 6.8 years. The most common reason for delaying IVF initiation was a lack of knowledge (44.4%), followed by inadequate facilities (23.8%), financial constraints (16.7%), and superstition (15.1%). On average, patients had undergone 5 ± 2 cycles of ovulation induction and experienced 4 ± 1 failed intrauterine insemination (IUI) attempts. The mean duration of infertility treatment prior to IVF was 7.7 ± 3.4 years (range: 3 to 17 years) (Table II).

Regarding gynecological factors, nearly 40% of patients had anovulatory menstrual cycles. Other conditions included bilateral tubal blockage (12.7%), severe endometriosis (11.9%), and premature ovarian failure (6.3%). Approximately 23% of participants had a history of miscarriages (MRs) or dilation and curettage (D&C), with 20.7% having undergone these procedures twice. Endometrial thickness measurements indicated that nearly 65% of patients had an endometrial thickness of 7-9 mm. Furthermore, more than three-quarters (77%) had favorable Anti-Müllerian Hormone (AMH) levels (2-4 ng/ml), while 23% had unfavorable AMH levels (<2 ng/ml). Additionally, 50% of patients had favorable serum estradiol (E2) levels (≥50 ng/ml). Hypothyroidism was present in 13.5% of the women, and 15.1% had diabetes mellitus, with a few cases exhibiting other hormonal abnormalities. In terms of male-factor infertility, approximately 23% of the male partners had oligospermia, while obstructive azoospermia, hypogonadal azoospermia, and oligoasthenoteratozoospermia (OATS) were each identified in 0.8% of cases. Unexplained infertility was noted in 11 cases (8.7%) (Table III). Diagnostic procedures before IVF included laparoscopy (27%), hysteroscopy (7.9%), and myomectomy (5.6%) was

done as therapeutic procedures (Table IV). Ultrasonographic evaluations before IVF indicated that 69% of patients had good-quality follicles, while 31% had poor-quality follicles. Following IVF treatment, over one-third (35.7%) of cases yielded 3-4 oocytes, which is considered favorable for IVF. However, only 23.8% of cases had > 2 embryos transferred (Table V).

Post-IVF treatment, 47 patients (37.3%) achieved conception exhibiting positive urinary pregnancy tests. Over one-third (35.7%) demonstrated the presence of a gestational sac on ultrasound. Out of 47 patients who conceived, 21(44.6%) progressed to full-term pregnancies, with 19(40.4%) resulting in singleton births and 2(4.4%) in multiple births thus giving a live-birth rate of 42.5% (20 out of 47). Of the remaining conceived cases, 13(27.7%) resulted in spontaneous abortions, 9(19.1%) were classified as blighted ovum, 3(6.4%) experienced preterm labor, and another 3(6.4%) were ectopic pregnancies. Of the 21 patients who reached full-term, 19(90.5%) underwent cesarean delivery, while 2(9.5%) had vaginal deliveries. (Table VI).

Table I. Distribution of patients by their Socio-demographic characteristics (n = 126)

Socio-demographic characteristics	Frequency	Percentage	Mean ± SD (range)
Age (years)			
20 – 30	50	39.7	--
30 – 40	52	41.3	--
≥40	24	19.0	--
Education of patients			
Primary	17	13.5	--
SSC	45	35.7	--
HSC	46	36.5	--
Graduate & above	18	14.3	--
Occupation of patient			
Housewife	76	60.3	--
Service	47	37.3	--
Business	3	2.4	--
Occupation of husband			
Business	50	39.7	--
Service	56	44.4	--
Labor	1	0.8	--
Others	19	15.1	--
Duration of marriage (years)	--	--	10.3 ± 5.4 (3-27)
Duration of infertility (years)	--	--	8.9 ± 4.4(4-20)
BMI (kg/m2)			
≥ 30 (Obese)	26	20.6	--
< 30 (Non-obese)	100	79.4	--

*****Mean age** = 32.6 ± 6.8 years; **range** = (20 – 47) yrs.

Table II. Distribution of patients by their Infertility profile (n = 126)

Infertility profile	Frequency	Percentage	Mean ± SD (range)
Types of infertility			
Primary	90	71.4	--
Secondary	36	28.6	--
Starting age of IVF (years)	--	--	32.4 ± 6.8(20-46)
Causes of delayed treatment			
Lack of knowledge	56	44.4	--
Lake of facilities	30	23.8	--
Low economic condition	21	16.7	--
Superstition	19	15.1	--
No. of past ovulation induction (cycles)	--	--	5 ± 2 (3-10)
Number of IUI failed	--	--	4 ± 1 (1-6)
Duration of infertility treatment (years)	--	--	7.7 ± 3.4 (3-17)

Table III. Distribution of patients by their indications of IVF

Indications of IVF	Frequency	Percentage
Gynecological factors		
Anovulation (PCO)	49	38.9
Both-sided tubal block	16	12.7
Severe endometriosis	15	11.9
Premature ovarian failure	8	6.3
Endometrial thickness (7-9 mm)	81	64.3
Previous history of MRs or D&C	29	23.0
Frequency of MRs (n = 29)		
1 time	23	79.3
2 times	6	20.7
Level of reproductive hormones		
Serum antimullerian hormone (AMH) (ng/ml)		
< 2	29	23.0
2 – 4	97	77.0
Serum Estradiol (E2) (ng/ml)		
< 50	63	50.0
≥ 50	63	50.0
Medical factors		
Hypothyroidism	17	13.5
Diabetes	19	15.1
Hormonal factor	2	1.6
Male factors		
Severe oligospermia	29	23.0
Azospermia obstructive	1	0.8
Azospermia hypogonadisn	1	0.8
Oligo-aestheno-terato-zospermia (OATS)	1	0.8
Unexplained infertility	11	8.7

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Table IV. Diagnostic/therapeutic procedures done (n=126)

Diagnostic/therapeutic procedures	Frequency	Percentage
Laparoscopy	34	27.0
Hysteroscopy	10	7.9
Myomectomy	7	5.6

Table V. Distribution of patients by IVF-related factors (n=126)

IVF-related factors	Frequency	Percentage
USG (Ultrasongraphy) findings before IVF		
Good follicle	87	69.0
Bad follicle	39	31.0
Number of oocytes released		
≤ 3 (Unfavorable)	81	64.3
3 – 4 (Favorable)	45	35.7
Number of embryos transferred		
≤ 2 (Unfavorable)	96	76.2
> 2 (Favorable)	30	23.8

Table VI. Distribution of patients by outcome of IVF treatment (n = 126)

Outcomes of IVF treatment	Frequency	Percentage
Outcome		
Conceived	47	37.3
Not Conceived	79	62.7
Detection of pregnancy after IVF		
Urinary Pregnancy Test (chemical pregnancy)		
Positive	47	37.3
Negative	79	62.7
USG detection of pregnancy (clinical pregnancy)		
Gestational sac present	45	35.7
Gestational sac absent	81	64.3
Fate of conception after IVF treatment (n=47)		
Spontaneous abortion	13	27.7
Blighted Ovum	8	17.0
Ectopic pregnancy	3	6.4
Preterm labor	2	4.2
Multiple pregnancy	2	4.2
Full-term singleton pregnancy	19	40.4
Mode of delivery in full-term pregnancy (n =21)		
Caesarian section	19	90.5
Vaginal delivery	2	9.5
Success rate or live-birth rate (n = 126)	21	16.7

DISCUSSION:

The present study provides valuable insights into the demographic and clinical characteristics of couples seeking in vitro fertilization (IVF) treatment in Dhaka, Bangladesh, and evaluates treatment outcomes in this population. The findings underscore the critical prevalence of infertility in the region and highlight several factors influencing couples' decisions to pursue IVF.

The mean age of participants seeking IVF treatment was 32.6 years, with a significant proportion of women between 30 and 40 years old. Facchin and colleagues (2020) in a recent study demonstrated that a growing number of women aged > 40 seeks assisted reproduction, despite the risks for their health[11]; This aligns with global trends where age is a critical factor in infertility, as female fertility typically declines after the age of 30. The data revealed that over 70% of participants experienced primary infertility, a point of concern given that primary infertility is often perceived to be more challenging to treat than secondary infertility. The mean duration of infertility prior to seeking treatment (8.9 years) indicates that many couples delay consulting fertility specialists, potentially diminishing their chances of a successful outcome.

One of the most striking findings was that about 45% of participants cited a lack of knowledge as the primary reason for delaying IVF treatment. In clinical settings, delays in treatment may arise from various factors, including medical, logistical, or financial issues. As ovarian reserve gradually diminishes with the advance of age, early treatment is crucial to optimize the chances of success in IVF treatment. Educational outreach & public awareness campaigns are crucial in addressing this gap. Many individuals and couples may remain unaware of the options available for infertility treatment and the importance of early intervention. Such education could significantly impact treatment uptake and improve overall fertility planning.

The study observed a positive clinical pregnancy rate of 37%. However, the success rate or the live-birth rate (measured on the basis of live birth per embryo transfer) was observed to be poor (16.7%) (21 out

of 126) compared to international benchmarks. Globally, the average IVF success rate is around 40% in young women. In India, the success rate of IVF ranges from 30% to 35%. The chance of success rates also increases in women younger than 35 years of age.[12] The reason of poor success rate might be that a notable proportion (42.9%) of our patients was 35 years or older. It is concerning that a considerable portion of conceived cases (27.7%) resulted in spontaneous abortions, indicating potential underlying issues such as advanced maternal age or health conditions among patients. Additionally, the occurrence of ectopic pregnancies and preterm labor in some cases raises important considerations regarding the need for rigorous pre-treatment assessments and enhanced monitoring during pregnancy.

The presence of favorable reproductive hormone levels in a majority of participants (e.g., high AMH and serum estradiol) suggests that many patients may have a good ovarian reserve, which is a positive indicator for IVF success. However, the study also encountered significant male-factor infertility; about 23% of male partners were diagnosed with oligospermia. In the USA, the male infertility factors for seeking ART treatment are even higher, which was nearly 30% of cases in 2021.[13] This suggests that addressing male infertility should be an integral part of the treatment discussions and considerations in IVF programs.

Overall, the findings affirm the need for comprehensive reproductive health services and policy initiatives aimed at improving access to IVF and infertility education. Trials and studies similar to this one could be foundational in developing standardized protocols for IVF treatment and patient education programs in Bangladesh. Ensuring that couples receive timely information and access to appropriate treatments could ultimately enhance fertility outcomes and contribute to improved reproductive health in the region.

CONCLUSION

The study provides valuable insights into the demographic and clinical characteristics of couples undergoing IVF treatment in Dhaka, Bangladesh.

The results indicate a high prevalence of primary infertility among participants, with significant barriers to accessing IVF services primarily attributed to a lack of knowledge and resources. Although the conception rate is more or less acceptable, the success rates observed in this cohort is inappreciably lower compared to global trends, leaving scope for further research to make IVF a viable option for couples experiencing infertility and who have difficulty conceiving with medical and natural means. The findings also emphasize the critical need for public health initiatives to raise awareness and educate about infertility and assisted reproductive technologies, enabling healthcare providers to better support couples on their journey to parenthood.

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