West African Journal of Assisted Reproduction (WAJAR)Vol1 No1

Available online at http://www.wajar.info/archive.html

CHALLENGES IN RUNNING/ESTABLISHING AN ASSISTED CONCEPTION CENTRE IN THE NIGER-DELTA REGION OF NIGERIA

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ABSTRACT

Background: In sub-saharan Africa, the technology of in vitro fertilization is gaining popularity. However, challenges towards a successful programme still exist and practitioners in the region grapple daily with these problems in their quest to put smiles on the faces of their teeming patients.

Objective: To document such challenges as observed over an 18-month period at a dedicated fertility unit in the Niger-Delta region of Nigeria.

Methods: This is a retrospective, descriptive study of our experience between December 2006 and June 2008, at the Port Harcourt Fertility centre. Case notes of all batched women were analyzed. Difficulties encountered during the period under review were recorded.

Results: An average of eight women were batched for each cycle per month. The age range of the women was 24 ï 51 years (34.4 ± 5.6). A total of 147 women commenced controlled ovarian stimulation during the study period. Of these, 11 (7.5%) were cancelled because of poor follicular response. Overall clinical pregnancy rate per embryo transfer was 32.6%. Some of the problems encountered include power surges, epileptic power supply, difficulty with procurement of consumables, reliance solely on endometrial thickness during pituitary down regulation, manipulation of treatment to coincide with visits by the embryologist and hostage taking.

Conclusion: Despite the difficulties, acceptable results are still possible with strategies adopted to surmount some of the foreseen challenges

Keywords: Challenges; IVF set up; batching; Niger-Delta

INTRODUCTION

Since the birth of Louise Brown in 1978, the technology of in vitro fertilization (IVF) has grown in leaps and bounds. Figures of the number of couples who require such treatment in sub-Saharan Africa are not readily available. It is known that worldwide, 8 ï 12 % of couples have difficulty conceiving at one point in their lives.[1,2] Of adult couples in African countries, it is estimated that 10 ï 25 % are subfertile.[3,] Adetoro and Ebomoyi reported a 30.3% infertility prevalence rate in a rural community in Nigeria.[4] Tubo-peritoneal factors remain the commonest cause of infertility in Africa and Nigeria is no exception.[5,6] This is not surprising as most of Africaôs 54 countries, including Nigeria, have restrictive abortion laws, resulting in nearly five million unsafe abortions each year.[7]
The result is that more people in this part of the world would probably require assisted conception.

Advanced form of assisted reproduction is an expensive venture to undertake worldwide. The same also applies to Nigeria where over 70 % of the population still lives below the poverty line.[8] Therefore, majority of the population cannot access the technology. The use of ART in developing nations has been criticized by some authorities[9]. The argument is hinged on overpopulation and the need to focus on other more pressing needs with the limited resources available. However, Unlike in the Western industrialized

world, parenthood appears to have more and arguably, deeper roots in African communities[10,11]. In the typical African society, children secure conjugal ties, offer social security, assist with labour, confer social status, secure rights of property and inheritance, provide continuity through re-incarnation and maintaining the family lineage and satisfy emotional needs[10]. The consequences of infertility in developing countries therefore range from severe economic deprivation, to social isolation, murder and even suicide[12,13.] It can therefore be suggested that the overpopulation and limited resource arguments falsely target ART and lack a more comprehensive understanding of the public health, social, psychological, economic, political and moral issues that are involved[13]

Platteau and colleaques[14] reported the difficulties they encountered in establishing the first IVF centre in Uganda, Central Africa. While the clinic was a converted apartment from a four flat building, they had to contend with difficulties with importing drugs, culture media and consumables. Worse still were problems with multiple power failures and night intruders. Just like in their centre, local craftsmen constructed our ICSI stabilization table at a relatively cheap cost of $78. The IVF practitioner in Nigeria is also confronted with many challenges as he struggles to provide succor to the few couples who can afford to pay for their treatment. Specifically, the oil rich Niger-Delta region in Nigeria has recently become violence prone as locals in different groups are up in arms with the National government of the day, fighting for a greater share of the oil revenue from the region. Clinical practice in this hostile environment is evidently not an easy task.

The aim of this study therefore is to document our experiences over an eighteen months period at a dedicated assisted reproduction technology (ART) centre in the Niger-Delta region of Nigeria.

MATERIALS AND METHODS

This is a retrospective, descriptive study carried out at the Port Harcourt Fertility Centre, Rivers State of Nigeria between December 2006 and June 2008. Case notes of all the women batched during this period were retrieved. Data, including age, number of oocytes retrieved, number of embryos transferred, fertilization rate and pregnancy rate as well as pregnancy outcome were retrieved for all the women who underwent controlled ovarian stimulation. All documented problems during the period under review were noted. Statistical analysis was by computing simple one-way and two-way frequency distributions, and summary descriptive statistics including proportions and means.

All the women had controlled ovarian stimulation with human menopausal gonadotropin (hMG) following the long protocol of pituitary desensitization with gonadotropin releasing hormone agonist (GnRH-agonist).

RESULTS

An average of eight women, were batched for each cycle per month. Duration of infertility ranged from one to 16 years (6.1 ± 3.99). A total of 147 women commenced controlled ovarian stimulation during the study period. Of these, 11 (7.5%) were cancelled because of poor follicular response. Nine of these were above 40 years of age. Of the 136 (92.5%) women who got to the stage of oocyte retrieval, four (2.9%) did not have embryo transfer (ET). Of the four women, one woman had two oocytes that failed to fertilize, another had no oocyte recovered from any of her 11 ófolliclesô and a third had a single oocyte with an empty zona pellucida. The last woman had no embryo transfer as her spouse had masturbation failure and declined all invasive means of sperm retrieval. The age range of the women was 24 ï 51 (34.4 ± 5.6) years. Table 1 shows the age distribution in relation to the clinical pregnancy rate. The highest clinical pregnancy rate occurred in those between the ages of 30 and 34 years (52.5%). The study included 38 women above 40 years of age. While 29 of them got to the stage of oocyte retrieval, 28 had embryo transfer with one woman having a single oocyte with empty zona pellucida. Only two (7.1%) pregnancies occurred in this group. Table 2 shows the pregnancy rate in women above 40 years who used their own eggs and those who used donor eggs. Eight women above 40 years used donor eggs and therefore did not undergo ovarian stimulation. Two (25%) of the women had clinical pregnancies while one had a biochemical pregnancy.

Two (22.2%) women out of nine achieved clinical pregnancy following frozen embryo transfer. The number of embryos transferred (ET)

was 3.17 ± 1.02. Overall clinical pregnancy rate per embryo transfer was 32.6%.

Table 3 shows the causes of infertility. Seventy six couples (55.9%) had semen abnormality ranging from mild oligoteratozoospermia to azoospermia while 26 (19.1%) had bilateral tubal blockage. Twenty (14.7%) couples had unexplained infertility. Sixteen (11.8%) couples had combined male and female factors as a cause of their infertility.

Number of oocytes retrieved ranged from 0 to 31 (9.1 ± 6.4). Two hundred and ninety oocytes (59.7%) fertilized out of a total of 486 subjected to IVF treatment, while 304 (76.4%) out of a total of 398 oocytes fertilized following ICSI. The multiple pregnancy rate was 18.6%, comprising of six sets of twins (14%) and two sets of triplets (4.6%). Only five (3.8%) biochemical pregnancies occurred. There were three (2.3%) cases of ectopic pregnancy, one (0.8%) case of heterotrophic pregnancy and six (4.6%) delayed miscarriages. There were 11 (8.1%) cases of OHSS, comprising of five mild and six moderate cases. Masturbation failure rate was 4.1%. Some of the problems encountered include frequent power surges, one of which was severe enough to blow up an incubator fuse, in addition to epileptic power supply, difficulty with procurement of consumables, reliance solely on endometrial thickness without serum estradiol levels during pituitary down regulation, manipulation of treatment cycles to coincide with visits by the embryologist, including kidnappings and hostage taking.

DISCUSSION

All the women commenced pituitary down regulation on menstrual cycle day 21 for an average 20.97 ± 8.6 days. This allowed better flexibility and synchronization of the different cycles, ensuring that controlled ovarian stimulation commenced at about the same time for batching. This practice arose because of the centreôs reliance on a single visiting embryologist who equally had to cover other centres spread across the country. This constituted a problem of its own as dates had to be constantly readjusted to fit in with his schedule. Although it has been argued that ovarian response to gonadotropins could be reduced in women whose pituitary down regulation is delayed as we sometimes did, the outcome in terms of pregnancy rates is still unclear.[15-18] However, our clinical pregnancy rate of 32.6% has been reassuring. Gonadotropin releasing hormone antagonists (GnRH antagonists) and oral contraceptive pills (OCP) have been used frequently in some clinics to achieve the same purpose of cycle scheduling or harmonization.[19,20]

Our masturbation failure rate of 4.1% was rather low, compared to the 20% reported by Platteau et al in Uganda.[14] This might be as a result of our practice of identifying such men early during the initial investigation phase and advising them to produce semen the evening before oocyte retrieval to reduce anxiety. Some freeze their sperms for a variable period before oocyte retrieval. Unfortunately, availability and sustainability of liquid nitrogen for cryopreservation in our environment is often times a luxury. With a land mass of over one million square metres and a population of over 150 million, reliance is placed on a single company with only two branches for the supply of liquid nitrogen.

There was a high contribution of the male partners in our setting to infertility (55.9%). This is probably because this select group for ART represents a skewed group from the total infertile group of the general population in which majority including males would have responded to treatment. Another possible factor is that male infertility is more difficult to treat compared to female infertility which might again explain the relative male preponderance in our sample. In our local environment however, majority of the couples who can afford the exorbitant fees for IVF work in the oil and gas industry. It would be interesting to evaluate if their exposure to hydrocarbons and other chemical agents have a role to play in reducing their sperm counts. The female contribution could however be higher as we do not commonly investigate for tubal patency once the semen analysis reveals severe oligozoospermia.

Measurements of endometrial thickness by transvaginal ultrasound scan during pituitary down regulation were used in our centre as the sole indicator of successful down regulation. Endometrial thickness of less than five millimeters, which corresponds to a plasma estradiol level of less than 150 ï 200 picomoles per litre, was used as indicator of complete pituitary desensitization.[21] Transvaginal ultrasound scan was also solely relied upon for patient monitoring during controlled ovarian stimulation. The delay in obtaining results of hormone assay at our centre, coupled with the need to reduce cost informed our practice of relying solely on endometrial thickness for pituitary desensitization and monitoring. Serum estradiol levels however have a good correlation with endometrial thickness and measurement of endometrial thickness allows an indirect assessment of estradiol secretion.[22,23] Some clinicians have even abandoned using hormone measurement for cycle monitoring when GnRH agonists are used. Such

clinicians depend solely on ultrasound scan for follicle surveillance.[24] Reports however show that measurements of estradiol levels are necessary in patients at risk of ovarian hyperstimulation syndrome (OHSS) on ultrasound monitoring.[25]

While no case was cancelled because of the fear of OHSS, severe, life-threatening OHSS did not occur in any of the women during the 18 months period, although our OHSS rate of 8.1% was rather high. Those at risk of OHSS had ócoastingô done for one or two days. Luteal support in such women was with progesterone suppository only, 400mg daily rather than our normal practice of instituting progesterone suppository in addition to a day four post embryo transfer injection of hCG. Six women (4.4%) had moderate OHSS requiring admission, abdominal paracentesis and fluid replacement only. The minimal monitoring methods we have adopted are cost effective and especially relevant in our resource poor environment.

Our multiple pregnancy rate of 18.6% was rather high especially as the trend now is towards single embryo transfer. However, with the high poverty rate prevalent in the country and the fact that majority can barely pay for one cycle in a lifetime, a policy of single embryo transfer might be difficult to implement in our practice. This is more so as Nigeria has the highest twinning rate from spontaneous pregnancies in the world, with the Yoruba tribe having rates as high as 50 per 1000 maternities.[26] There is also a general belief that twins are able to bestow happiness, health and prosperity upon their family.[27] In a recent study, we found that despite knowledge of the barrage of complications associated with multiple pregnancy, majority of our patients still preferred the transfer of multiple embryos because of their desire for twins.[28]

The epileptic power supply from the national grid in Nigeria is a hydra headed problem that has defied all solutions. Lack of power may range from 10 hours a day to two weeks at a stretch! Just like Platteau et al[14] experienced in Uganda, reliance is therefore placed largely on generators powered by either diesel or petrol engines. This places a huge burden on the ART practitioner, as the commodities (diesel or petrol) are often expensive and difficult to come by. Added to this is the frequent surge in current that often damages equipments and electrical appliances. One such experience involved a blown incubator fuse with embryos for the last two couples in a batch still running. The problem was observed about six hours later and the embryos transferred about five hours after (11 hours after it was first observed), thirty-six hours after oocyte retrieval. One of the women achieved a pregnancy with the delivery of a male 2.6 kg neonate at term with no congenital anomaly. With no known service centre in the country, the incubator had to taken back to the manufacturers in Europe just to have a fuse changed! Unfortunately, it was observed that surge protectors (stabilizers) available in the country, although they met the required specification, did not help protect the appliances against power surge and so each appliance including incubators, ICSI machine and work station had to be protected in addition with individual 5KVA capacity uninterrupted power supply (UPS). Because of this unfortunate experience, it is now our hospital policy to check on the incubator every four hours during a batch.

The initial problem of procuring consumables is gradually easing off as major distributors are now available in the country. However, as these drugs and other IVF consumables are not produced in the country, one had to place orders sometimes for upwards of two weeks before they arrive. Upon arrival in the country, the drugs and consumables still needed to be

transported to the centre. Unfortunately, the international airport, which also has a domestic terminal that services our immediate environment, was out of service for one full year for repairs. Consumables and media (in icepacks) were sent throughout that period by road, a journey of 10 to 18 hours, depending on the state of the roads at each point in time.

As at the time of this study, the problem of hostage taking for ransom was still rife in the Niger-Delta region. Initially only foreign oil nationals were targeted. Presently kidnapping has been extended to involve medical doctors and their family members, wealthy Nigerian indigenes and politicians. Often toddlers and women are targeted. For this reason, scheduling consultations is sometimes an uphill task as such people who form the bulk of our patients are often afraid to be seen in the open. We sometimes had to arrange late night consultations and rarely home consultations to meet the needs of some of these couples while exposing ourselves to similar risks.

It is our candid hope that the situation would soon normalize as it is definitely affecting our practice. Improving the living standards of the people would likely improve the security situation. More embryologists would need to be trained, though they could still be lost to the developed world because of the better living conditions and superior salaries they stand to earn. Above all, tackling corruption would bring sanity to system which would equally benefit the IVF practitioner in Nigeria. Despite all the difficulties we are faced with however; we believe acceptable results are still possible with strategies adopted to surmount some of the foreseen challenges.

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Table 1: Age distribution and clinical pregnancy rate

Age (yrs)	n(ET)	Pregnancies	Clinical Pregnancies	Clinical Pregnancy/ET(%)
<30	30(29)	11	11	37.9
30 – 34	40(40)	24	21	52.5
35 – 39	37(35)	11	9	25.7
≥40	29(28)	2	2	7.1
Total	136(132)	48	43	32.6

Table 2

Clinical pregnancy rates in women above 40 years using own or donor eggs

Gamete source	n	ET (%)	Clinical Pregnancy rate/ET (%)
Own eggs	38	28(73.7)	7.1
Donor eggs	8	8(100)	25

Table 3: Causes of infertility

Causes	n	%
Semen Abnormality	76	55.9
Tubal Block	26	19.1
Polycystic ovarian syndrome	13	9.6
Uterine Synechiae	1	0.7
Unexplained	20	14.7
Total	136	100