

Referral for assisted reproductive technology: Indications and treatment outcome

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Dear Sir,

Africa has the highest rate of infertility, mostly due to tubal occlusion. Paradoxically, however, it records the lowest rate of assisted reproductive technology (ART) treatment.^[1] ART services are unaffordable to the majority of patients in Africa.^[2] I conducted a prospective review of 23 consenting infertile patients/couples referred for ART following counseling that a treatment cycle would cost an estimated US \$4000. The patients were seen and referred for treatment between years 2000 and 2007. In this study, successful ART treatment was measured by number of clinical pregnancies.

Over an 8-year period, 23 consenting infertile patients/couples were given referral for assisted conception. The median age was 36 years and mean duration of infertility was 43 months. Indications for referral as shown in Table 1 were male factor in five (21.7%) patients, female factor in seven (30.4%) patients, and both male and female factors in eleven (47.8%) cases. Of the 16 patients with infertility due to male factors, 4 (25%) had azoospermia and 12 (75%) had oligoasthenospermia. In 18 patients with infertility due to female factors, 11 (61.1%) had tuboperitoneal factors and 3 (16.7%) had ovulatory disorders; the remaining 4 (22.2%) cases had a combination of tuboperitoneal factors and ovulatory disorders. Out of the 23 referred cases, 9 (39.1%) had treatment (7 in Nigeria and 2 in the UK); 1 (4.3%) was denied treatment in Nigeria on account of her desire to use donor sperm and become a single parent; and the remaining 13 (56.2%) patients could not afford the treatment. Nine ART-created pregnancies were recorded in seven (77.8%) of the nine patients that had treatment; the remaining two (22.2%) failed to conceive after one and three treatment cycles, respectively. Of the nine ART-created pregnancies, five (55.6%) were singleton pregnancies, three

Table 1: Indications for referral and treatment outcome

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| Indications | 23 | % |
| Male factor | 5 | 21.7 |
| Female factor | 7 | 30.4 |
| Combined male and female factor | 11 | 47.8 |
| Causes of male factor | 16 | % |
| Azoospermia | 4 | 25 |
| Oligoasthenospermia | 12 | 75 |
| Causes of female factor | 18 | % |
| Tuboperitoneal | 11 | 61.1 |
| Ovulatory | 3 | 16.7 |
| Tuboperitoneal and ovulatory | 4 | 22.2 |
| Outcome of referral | 23 | % |
| Had treatment | 9 | 31.1 |
| Had no treatment | 13 | 56.5 |
| Denied treatment | 1 | 4.4 |
| Outcome of ART | 9 | % |
| Successful | 7 | 77.8 |
| Failed | 2 | 22.2 |
| Type of pregnancy | 9 | % |
| Singleton | 5 | 55.6 |
| Twins | 3 | 33.3 |
| Triplets | 1 | 11.1 |
| Mode of delivery | 9 | % |
| Caesarean section | 7 | 77.8 |
| Vaginal delivery | 2 | 22.2 |
| Fetal outcome | 14 | % |
| Live birth | 14 | 100 |
| Neonatal death | 1 | 7.2 |
| Congenital anomaly (big umbilical hernia) | 1 | 7.2 |

(33.3%) were twin pregnancies, and one (11.1%) was a triplet pregnancy. Outcome of the nine pregnancies were 13 live births following seven (77.8%) term caesarean deliveries and two (22.2%) term vaginal deliveries. One congenital umbilical hernia and one mortality due to complications of exchange blood transfusion were recorded.

The high pregnancy and live birth rate recorded in this study may have been influenced by favorable variable among the patients that had ART treatment. Variables like maternal age, duration of infertility, and number of previous *in vitro* fertilization (IVF) attempts are known determinants of success in IVF treatment. Age is a prognostic factor in embryo quality.^[3] Good-quality embryo translates to better rates of fertilization, implantation, clinical pregnancy, and live birth.

The issue of marital status and accessibility to ART treatment is contentious. Most developed countries have legislation or guidelines regulating the practice of ART. The decision to deny a patient access to donor sperm and become a single parent in one case in this study was based solely on religious and cultural factors influenced by societal preference for a traditional heterosexual family. However, one study^[4] has demonstrated positive mother–child relationships and well-adjusted children in single heterosexual–mother families, comparable to married heterosexual families.

Anonymous donor sperm was used to achieve conception in four of nine ART–created pregnancies. Traditionally, in most part of the world, gamete donation has been treated with strict anonymity to protect the physician, the donor, and the parents. Remuneration and compensation for donors is another issue that has moral, ethical, and legal dimensions that must be addressed. In settings where anonymity and remuneration have been abolished, delay in treatment has increased as donors become more reticent.^[5] Sauer^[6] have reported far fewer egg donation cycles in Europe, where anonymity is removed, compared to the United States, where there is no government restriction in terms of donor anonymity and remuneration. Besides sperm, eggs, and embryos, ovarian and testicular tissues can also be donated.

Women undergoing assisted conception treatment face a 20-fold increased risk of twin pregnancy and 400-fold increased risk of higher-order multiple pregnancy.^[7] In this series, a multiple pregnancy rate of 44.4% was recorded. Other authors^[8] have quoted multiple pregnancy rates in the range of 36% and 38%. Multiple pregnancy is culturally acceptable in most African societies, but it is known to increase perinatal mortality/morbidity and it also increases the burden on the maternity and neonatal services. Multiple pregnancy should be viewed as an inadvertent and unacceptable consequence of assisted conception. The performance indicator should be the live birth rate per ART cycle and not pregnancy rate.

One case of congenital abnormality was recorded in this study. An earlier systematic review^[9] did not find an increase in birth defects in the offspring of assisted conception compared to naturally conceived offspring. A prospective multicenter cohort study^[10] did report a significant rate of major malformation in infants conceived through intracytoplasmic sperm injection (ICSI) compared to naturally conceived infants. More specific are imprinting disorders like Beckwith–Wiedemann syndrome and Angelman syndrome, which have increasingly been associated with assisted conception.^[11] Overall, there is insufficient evidence to conclude that genetic

risk and congenital malformation are increased in assisted conception.

Preference for a child of one particular gender is a source of concern in most African societies. A patient in this series embarked on reproductive tourism for this purpose. Sex selection is not acceptable in most countries, but it is allowed in the US. The technology used is MicroSort™, which is claimed to improve the chance of a female pregnancy to 89.5% and male pregnancy to 73.6%. Using a flow cytometer, the male (Y) and female (X) sperms are separated. The female (X) sperm are larger and contain more DNA and, as such, they take up more dye and fluoresce more brightly than the Y sperm when exposed to laser light.

Outcomes of ART and ART–created pregnancies are encouraging. However, accessibility to ART can only be increased with provision of low-cost ART treatment.

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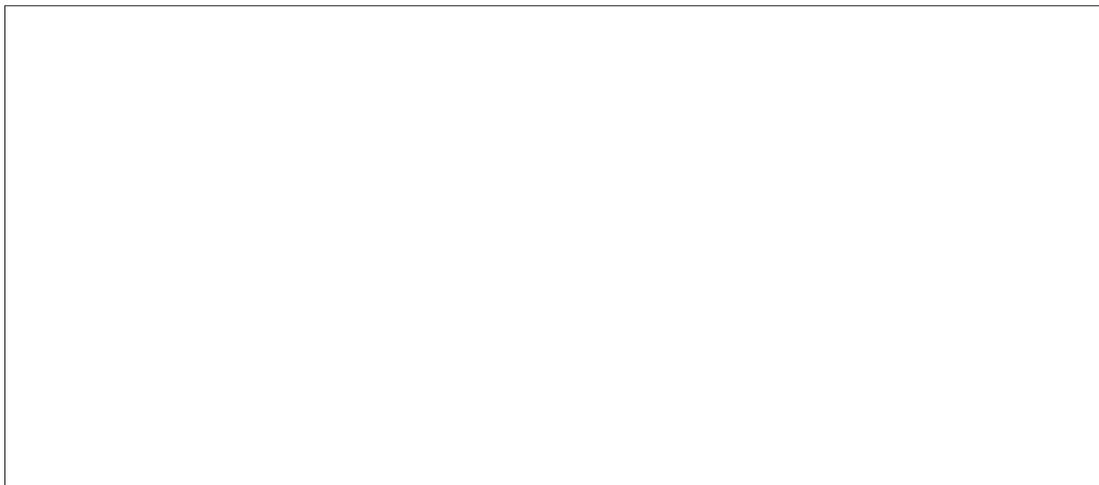
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