

Evolution of *In Vitro* Fertilization at The University of the West Indies, Jamaica

AM Pottinger¹, D Everett-Keane², C McKenzie²

ABSTRACT

In vitro fertilization (IVF) provides hope for many couples who believed that they could not have children. This paper tracks the development of IVF treatment at The University of the West Indies (UWI), Mona, from its genesis in 2000. It highlights changes over the years in the population seeking IVF at UWI, Mona, and describes clinical services offered to clients, comparing success rates of services internationally. It also reports on seminal research emerging out of UWI, Mona, in the field of assisted reproductive health. The Hugh Wynter Fertility Management Unit (HWFMU), UWI, Mona, leads the way in shaping how society views those challenged with infertility and in its use of assisted reproductive technologies that improve the quality of life for many locally, within the Caribbean and the Diaspora.

Keywords: Egg sharing, infertility, *in vitro* fertilization, psychological counselling

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RESUMEN

La fertilización *in vitro* (FIV) ofrece esperanza a muchas parejas que una vez creyeran no poder tener hijos. Este trabajo sigue el desarrollo del tratamiento de FIV en la Universidad de West Indies (UWI), Mona, a partir de su génesis en 2000. El mismo resalta los cambios durante los años en la población en busca de FIV en UWI, Mona, y describe los servicios clínicos ofrecidos a los clientes, al tiempo que compara las tasas de éxito a nivel internacional. También reporta acerca de la investigación seminal proveniente de UWI, Mona, en el campo de la salud reproductora asistida. La Unidad de Tratamiento de la Infertilidad Hugo Wynter UTIHEW), UWI, Mona, liderea el camino en cuanto a formar cómo la sociedad ha de ver a aquellos que enfrentan problemas de infertilidad, así como en relación con el uso de las tecnologías de reproducción asistida que mejoran localmente la calidad de vida de muchas personas en el Caribe y en la Diáspora.

Palabras claves: compartimiento de óvulos, infertilidad, fertilización *in vitro*, orientación psicológica

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INTRODUCTION

About 15% of couples globally will have problems conceiving and/or bringing a baby to term, with the rates climbing to mid 30% in some developing countries (1). Infertility is defined as the inability of a couple to get pregnant despite engaging in unprotected sexual intercourse for at least 12 months (2). It is an emotionally challenging experience that

causes distress levels comparable to those of other major illnesses such as cancer (3). Infertility can be categorized as primary or secondary. Primary infertility is never having achieved or contributed to a viable pregnancy and secondary infertility is the inability to achieve a viable pregnancy following a live birth or voluntary termination (4). Although there is an impression that infertility has become more prevalent with more women delaying child bearing and couples waiting longer until more financially secure to start families, data depicting increased prevalence are not supported in the developed world (4). Rather, infertility has become a health concern that is increasingly being acknowledged by the public and as a result there is increased demand for medical services (4).

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In vitro fertilization (IVF) technology was first introduced to the English-speaking Caribbean in 1996 in Trinidad and Tobago and a 2001 report of the first five years' experience revealed an overall live birth rate of 12.1% in a sample, with the majority of women older than 35 years (5). The authors concluded that at that time, most women who pursued assisted reproductive technology (ART) in the Caribbean were likely to be of advancing age as ART had not been available previously and it was not widely affordable to the young, as persons had to be self-financing (5).

Although less physically invasive ART such as fertility drugs and intrauterine insemination has been offered for some time by medical practitioners in Jamaica. The Hugh Wynter Fertility Management Unit (HWFMU) at The University of the West Indies, (UWI), successfully completed its first IVF procedure in 2000 (6). Since then the Unit has been responding to the varying needs of a population challenged by infertility and developing programmes that are on *par* with those in more developed countries. With a current take home baby rate of 16.8%, 230 babies have been born through ART from the HWFMU to families across Jamaica, the wider Caribbean and diaspora since 2000. These have been from interventions including IVF and intracytoplasmic sperm injection (ICSI), using fresh cycles or frozen gametes and embryos, and egg sharing. Comparable live birth rate out of the United Kingdom (UK) between 1991 and 2008 is 21.3% (7). Clinical practice and research out of HWFMU have positively impacted on the quality of life of many and is helping to shape how society views this population.

The demographics of the population seeking services at HWFMU have changed in some respects over the years. In the early 2000s, the typical profile of a client was between the ages of 37–45 years, married, of tertiary education and 'middle class' (8, 9). Whilst this profile remains typical, in 2009–2011, the number of young persons (26–31 years) seeking IVF doubled and more persons were of single marital status and in common-law relationships. Persons are also seeking IVF earlier: in 2003–2005, 26% of those seeking IVF sought the services after trying to have a child for 1–3 years, while in 2009–2011, this number increased to 40%. We are also currently seeing a greater proportion of female factors as cause for the infertility. Earlier studies revealed a M:F ratio of 33%:39% (9) and in 2009–2011 we obtained a ratio of 26%: 46%, that is closer to the breakdown of 35%: 50% reported in the international literature (10).

Research out of the Unit on assisted reproduction has been focussing on evaluating clinical efficacy and output. In 2011, ICSI was evaluated as a successful treatment for severe male factor infertility. The fertilization rate from ICSI was found to be 77.5% for those with substandard semen, 59% for those with semen retrieved by surgical sperm method and 72% for those who had done IVF previously and had an unsuccessful outcome (11). Although fertilization rates were not significantly affected by how semen was collected *ie*, by ejaculate or surgically, the age of the female partner in-

fluenced outcome, with older women being less likely to have a live birth following ICSI (11). Of note, fertilization rates found in this study were comparable to international rates regardless of the cause of the infertility (11).

As more and more children are being born through ART, research is required to inform about their development and the quality of family life and functioning in these families. The first follow-up study on Jamaican children born through IVF, and their families, was begun in 2009. In this case-control study, data analyses reveal some differences in parents' demographics between children born of natural conception (NC) and those of IVF-assisted birth (IVF). *In vitro* fertilization-assisted birth parents were more likely to be older, tertiary-educated with professional employment and in married or long-term stable unions. The children of IVF had higher IQ scores than their counterparts but this difference is attributed to parents' occupation and educational level. Some differences were also noted in terms of parents' perception of parenting competency and the impact of having a child on the quality of family life. More of the NC parents (63%) compared to IVF (19%) reported feeling emotionally burdened having had their child but there was no difference between the groups in terms of quality of spousal relationship or dominant use of a parenting style. A paper on this data is being prepared for journal submission.

In addition to producing research that impact health policies and services, part of the Unit's mandate is to demystify infertility in a society where childlessness is associated with significant social stigma and causes much emotional trauma. There are those in the Caribbean who believe that involuntary childlessness is caused by dietary habits, the prolonged use of contraceptives, is an act of God, punishment for sins of the past, or is as a result of witchcraft (12). Individuals who are thought to be infertile are generally ostracized and relegated to an inferior status in society and stigmatized with labels such as mule, barren, not really a man and forsaken by God (13). These attitudes are not unique to developing countries. Family physicians in Germany have been accused of being judgmental in attributing childlessness to their patients' personal behaviour or way of life (14). Studies out of the United States of America (USA) have highlighted how the media perpetuate myths that place the blame of infertility on women and their sexual decisions (15). Local research on beliefs about infertility have reported on gender differences in coping with infertility among Jamaican men and women and identified strategies that place women at risk (9).

Psychological counselling was added to the programme at the HWFMU in 2003. Due to limited resources, one in three couples seeking IVF treatment are counselled, resulting in 371 persons being counselled up to December 2011, in addition to all women registered for egg sharing (n = 65). Counselling sessions are conducted individually and jointly to couples and the aim is to prepare the couples for coping with IVF treatment and its outcome. A 2005 sur-

vey (8) on the efficacy of counselling revealed that more than 90% surveyed identified that counselling had (i) allowed them to explore their internal feelings (100%), (ii) provided factual information about IVF (96%) and overall helped to prepare them for the impact of IVF (92%). 'Being able to express concerns and fears to the medical staff' was the least endorsed item (by 80%) and 25% identified that emotional support after IVF treatment was lacking (8).

The egg sharer programme was initiated in 2005 and the first egg sharers were screened and counselled in 2006. Egg sharers are women who have consented to share (up to half of) the eggs harvested in a single IVF treatment cycle with another infertile couple; they may have a diagnosis of blocked or lost fallopian tube, unexplained infertility or their partner has an underlying male factor. Minimum criteria to be an egg sharer include: age 18 to 35 years, have an acceptable body mass index (BMI), normal menstruation cycle and hormone levels, be free of any transmissible disease and in a stable relationship. Before being accepted as a sharer/donor, the woman provides information on her medical history including family history, undergoes viral screening and karyotyping, is evaluated psychologically and is counselled with her partner. The egg donation programme is anonymous and the sharer/donor benefits in a 50% reduction in the cost of the IVF treatment.

The recipient couple undergoes similar testing and criteria as the egg donor but the female may be considered up to the age of 50 years. Common reasons for being a recipient includes: having certain medical conditions that preclude having eggs (such as Turner's syndrome), the absence or malfunctioning of ovaries (*ie* due to cancer treatments), advanced female age or having a genetic defect that the woman does not wish to be passed on to offspring. Once the accepted donor has been matched physically with a suitable recipient, the attempt is made to synchronize the donor and recipient to have a fresh cycle. If this is not possible, however, the resultant embryos are frozen for later use.

Up to December 2011, 65 donors were registered for the egg sharer programme and there has been 34 fresh cycles by 28 clients. Donors can have up to three treatment cycles. Some of those registered were found to be unsuitable ($n = 23$) due to, for example, their medical history. To date, there have been nine clinical pregnancies resulting in five births; and for the recipients, out of 28 fresh cycles by 23 clients, there have been six clinical pregnancies resulting in four births. Additionally, there have been 16 frozen embryo transfer cycles from 13 patients resulting in five clinical pregnancies and three births. Since inception, the take home baby rate for egg sharers is 21% overall.

Concluding Remarks

One of the unique contributions of the HWFMU is its leadership role in educating the public about infertility and assisted

reproduction technology. In recent years, the Unit has been getting requests from less traditional families seeking to conceive such as homosexuals, persons of HIV⁺ status, single women interested in sperm donation, egg sharing and surrogacy. The Unit is poised to respond to the needs of not only those within society's *status quo* who are marginalized because they are infertile but also those disenfranchised from society who wish to be a parent.

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The University of the West Indies (UWI), originally University College of the West Indies, is a public university system established to serve the higher education needs of the residents of 17 English-speaking countries and territories in the Caribbean: Anguilla, Antigua and Barbuda, The Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Grenada, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, and Turks and Caicos Islands.

Medicinal plants of Jamaica studied at the University of the West Indies, Mona family, botanical name, common name, growth range, growth habit, and ethnomedicine. PRN and Family. Botanical name. Common name. Growth range. Growth Habit. Ethnomedicine/Biological activities (Uses as stated in papers).
Inhibitory action in animal tumour in vitro systems. Isolated jatrophone, a macrocyclic diterpene used clinically as an anti-leukaemic agent. 128. 99. Ricinus communis. Castor oil. No effect on 5 bacteria, very active against B. microplus (82A1); low. It is now 8 years since Steptoe and Edwards announced the birth of the first child born as a result of in vitro fertilization (IVF) and embryo transfer. The technique had been successfully applied to bypass the mechanical absence of the patient's fallopian tubes, surely the most obvious application of such technology. In the 8 years that have passed, IVF and related technologies have changed the face of the treatment of the infertile patient. It is now applied to virtually all forms of infertility where more conventional treatments have failed, and it has now become internationally established.

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