

The Assisted Conception Unit in Hamad Medical Corporation: An Overview, Achievements, and Future Directions

This article was published in the following Scient Open Access Journal:

Journal of Pregnancy and Newborncare

Received March 11, 2020; Accepted March 23, 2020; Published March 31, 2020

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Abstract

The global rise in the number of people suffering from primary and secondary infertility has resulted in an increased number of assisted conception units opening their doors for couples seeking In Vitro Fertilization (IVF) treatment. This paper aims to review the current situation of the first and major provider of IVF services in Qatar. It provides an overview of the establishment of the Assisted Conception Unit (ACU) in Hamad Medical Corporation (HMC); its achievements and prospects. Since its opening in 1993, the unit has brought hope to infertile couples in Qatar. The number of treatment cycles performed in the unit has increased progressively to reach more than 1500 cycles in 2019 with 51.3% clinical pregnancy rate per embryo transfer for all age groups. With its transition to the new location in the Qatar Rehabilitation Institute (QRI), the prospects of the unit are promising with aspirations to expand the services to embrace double the number of treatment cycles performed currently and to become a regional center of excellence in Assisted Reproductive Technology (ART) providing superior quality care and outcomes to infertility patients.

Keywords: Assisted Conception Unit, IVF, Qatar, ART, Hamad Medical Corporation

Introduction

With more than 180 million suffering from primary and secondary infertility [1] the need for accessible IVF services has increased globally. In response to this, there was an increase in the number of Assisted Reproductive Technology (ART) clinics providing care for infertile couples all over the world. In Qatar, prior to 1993, infertile couples seeking IVF treatment were sent abroad, which constituted emotional stress to the patients and a substantial economic burden to the government. In 1993, domestic ART was made available to infertile couple. Since its opening, ART has been applied routinely in the ACU of the Women's Hospital in Qatar in order to increase the chances of achieving parenthood for couples undergoing this kind of treatment. The services provided were expanded in line of the advancement of the field all over the world. This paper aims to provide an overview of the establishment and development of the ACU in the Women's Hospital of HMC as the first and major provider for IVF services in Qatar. It walks us through a journey of success and overcoming challenges. The following segments of the paper cover the driving mission of the unit, the team, the current services provided, and the future plans.

Overview of the establishment of ACU

The ACU was officially inaugurated in Qatar on the 6th of April 1993 in the Women's Hospital in HMC [2]. HMC is the main provider of secondary and tertiary healthcare in Qatar, under which falls 12 different hospitals and centers. The ACU was the third center to open in the Gulf region after Saudi Arabia and United Arab Emirates [3]. Although, it was not purposely built for ART, it has become the leading center for infertility treatment in Qatar. It is based in the Women's Hospital. The unit started enrolling patients earlier in March 1993. Initially, between April and mid-September of the same year, the IVF laboratory services were assisted by the Australian team from Melbourne Fertility Services, and the activities were conducted in sessions. With the appointment of its own IVF laboratory director and embryologists on September 1993, the unit started to function independently on a continuous basis. A wide range of female patients were enrolled including those diagnosed as having tubal diseases, endometriosis, sperm antibodies and unexplained infertility. Also enrolled were couples with male factor, which predominated.

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The unit services were initially restricted to Qatari nationals. The first IVF case was done on April 15, 1993 and the first IVF baby girl was born at the end of 1993. The attempted treatment cycles during this year reached 152 and have resulted in 14 clinical pregnancies (9%), six deliveries, and nine take home babies (due to birth of triplets). In May 1996, the Center was made accessible to expatriate patients as well. The number of IVF cycles increased progressively to reach more than 1,512 treatment cycles in 2019 with the clinical pregnancy rate per embryo transfer for all age groups from first cycle reaching up to 51.3 %. A wide range of the latest techniques in the ART field were introduced in the Unit in response to the increasing number of patients willing to undergo any treatment that might help them conceive.

The current ACU has its own operating theatre, 2-bedded preparation room, 6-bedded recovery room, IVF lab., two consultation rooms, ultrasound room, IVF medical records room, IVF office, and IVF reception. The unit is well equipped with state-of-the-art technology in the field, and it is adequately staffed with a qualified team. It operates on a Day Care Service basis, which comprises of 2 types of services; Clinic and Day Care Surgery services. It aims to provide evidence-based services in accordance to the latest assisted conception techniques to improve fertility of patients. Services are provided free for Qataris and with subsidized fees for non-Qatari [4].

ACU mission

The ACU is dedicated to providing patient-centered, effective, safe, and innovative reproductive care. The multifaceted mission of the ACU falls under four main categories. The first one is to provide efficient and effective treatment options for infertile couples. The treatment options include but are not limited to; artificial intrauterine insemination (IUI), and a wide variety of ART services such as IVF, Intracytoplasmic Sperm Injection (ICSI), embryos and gametes cryopreservation, and preimplantation genetic testing (PGT). ART services are provided based on each patient/couple's needs and situation in a caring and proficient environment which fosters and supports them through their journey. The ACU aims to render the best services to all the infertility couples/patients whether they are Qatari or Non-Qatari.

The second mission is to conduct research that will nurture evidence-based practices. The findings of this research will help build a scholarly database for IVF in Qatar. This will aid physicians in implementing the best patient's stimulation plans, and laboratory embryologists may improve their IVF techniques accordingly. Eventually, it will improve the quality of services in Qatar and the region. Alongside improving treatment outcomes, the potential complications of IVF protocols may be minimized through procedural choices that will help in the formation of the basis for formulating various guidelines and regulations which are needed to standardize various techniques and avoid the misuse of this technology.

Fertility preservation is the third mission of the ACU. With the increase in survivorship following cancer treatment, the demand to preserve male/female gametes in order to be able to pursue the conventional course of fertility treatments is rising. Preservation of fertility is of great importance for both young and adult male/female patients as it reduces the long-term morbidity of their cancer treatment [5]

The fourth mission of the ACU is to perform Pre-implantation Genetic Testing (PGT). PGT is a powerful genetic tool performed during IVF treatment to help couples build a healthy family [6]. Fertile couples who have a known history of a genetic condition in their families should consider PGT testing to prevent transmission of monogenic disorders that cause serious illnesses to future generations [6] and significant costs to the state for the additional care that had to be funded. Providing access to PGT services reduces the risk of an abnormal childbirth and therefore reducing long term additional care costs [7].

ACU vision

The vision of the ACU is to provide the highest standards of individualized care to help and support all patients' try and realize their hope of having a child. The unit also looks forward to becoming a regional center of excellence in ART providing superior quality care and outcomes to infertile patients, and conducting robust ethical research aiming to transmit the changes in the IVF lab to clinical care.

ACU team

The multidisciplinary team of the ACU comprises of the head of the unit, infertility consultants, IVF Lab team, head nurse, infertility nurses, and administrators. The head of the unit and the infertility consultants are nationally and internationally qualified and have worked in the field of Reproductive Medicine for more than 25 years. The current IVF Lab team is comprised of the Lab Director, Assistant Executive Director of clinical services, the Lab Supervisor and seven embryologists who have a biomedical science background and a breadth experience in clinical embryology and ART. The IVF Lab team is devoted to the most progressive methods of embryo manipulation and culture. The head nurse and the infertility nurses are integral members of the team. The nurses are predominately based in the theater, recovery suite and the IVF/infertility clinics helping to plan and deliver the care that provides the best possible experience for patients seeking the service.

Services of the ACU

The ACU is well equipped and staffed to offer a full range of infertility treatments to the widest group of patients. The treatment program to be selected depends upon the needs and preferences of each individual couple, and could consist of one or a combination of the following treatment options:

Comprehensive pre-treatment fertility assessment and evaluation, Ultrasound examination, Artificial insemination, Ovarian stimulation therapy, Assisted fertilization via IVF/ICSI, Embryo culture and transfer.

Alongside the above-mentioned services, the unit has a cryopreservation facility where sperm freezing, oocyte freezing, and embryo freezing are done. The unit also provides surgical sperm retrieval for male (e.g., Microsurgical Epididymal Sperm Aspiration (MESA), Testicular Sperm Extraction (TESA), Percutaneous Epididymal Sperm Aspiration (PESA)). Preimplantation Genetics Testing (PGT) is a new service that was introduced into the unit three years ago. PGT includes both Preimplantation Genetics Testing for Monogenic disorders (PGT-M) and Preimplantation Genetic Testing for Aneuploidy (PGT-A) [8]. This technology identifies genetic defects in embryos

created through IVF before transferring them to the uterus, thus decreasing births with genetic abnormalities [6].

Challenges faced the ACU

Through its journey, the ACU has gone through many challenges. These challenges fell under several main categories like personal and expertise recruitment, creating collaboration opportunities, regulating the provision of ART services, and creating a quality control system to mitigate risk and improve quality of work. Despite all these challenges, the unit managed through its experienced leadership to become a unique standing center for IVF services in Qatar.

Forthcoming ACU and future directions

In response to the directives of Qatar 2030 vision [9], which plans on establishing high quality, accessible and affordable, world class healthcare system that covers preventive and curative care for the population; and the Qatari Population Policy 2009 [10], which promotes higher fertility rates among its citizen, HMC is planning to promote the quality and capacity of the assisted conception services. A new infertility center with local, regional, and international aspirations will be opening soon. The new infertility center will be located on the second floor of the QRI with a total area of 2289 m². The center will contain standard components to comply with details described in the International Health Facility Guidelines. Laboratories are to comply with applicable statutory requirements and international standards for clean rooms [11].

The new center can accommodate up to 3000 IVF cycles per year. It will provide the patients with the latest in technology services and with high quality fertility experience to be unique worldwide. This state-of-the-art high-quality medical care in the field of reproductive medicine will be delivered by well qualified and experienced infertility consultants in an ultramodern academic fertility center. The IVF laboratories are the core of the center. The highly trained Embryologists and the lab structure contribute to the excellent quality of the services provided, the safety of the procedures, and the serene environmental working conditions.

The center will be electronically monitored 24 hours a day, 365 days a year. A new Infertility database system will be integrated with Cerner. Databases containing patient health outcomes which are linked to fertility parameters will be an invaluable source of novel information, which will be instrumental in promoting patient care and in the creation of meaningful research within the field. The new center will also embrace an Electronic Witnessing System. The electronic witnessing system provides complete electronic traceability of gametes; recording the 'who, what, where and when' at every step, including photographs of all procedures, unbroken chain of custody evidence and comprehensive reporting [12]. By delivering the very highest quality in clinical care, the center will serve as a magnet for patients within the borders of the state of Qatar and beyond.

In addition to the infertility services, the center will provide elite programs in the region pertaining to ART. These programs include but are not limited to; Preimplantation Genetic Testing Program, Fertility Preservation Program, Male Infertility

Program, Research and Training Program, and a Fellowship Program. The future plans of the new center will elaborate on the current research that is undertaken and will expand on the efforts to involve a wide range of topics including stem cell research, gametes bio-banking and reproductive genetics. Moreover, the center is planning to introduce a new fellowship in Reproductive Medicine. Fellows in the program have the opportunity to pursue specialty training in clinical and medical care of infertility patients. Also, among the prospects of the new center is establishing a PGT Laboratory under our management in order to perform PGT-A and PGT-M in-house as the service is provided currently by an internationally renowned company in genetic testing and is managed through the IVF lab team who is doing the Embryo Biopsy. A world class PGT lab service in Qatar will not only reduce the waiting time for our patients but will also add to the prestige and reputational integrity of HMC and Qatar, as well as, making significant cost savings in the process. Fertility preservation is on the list too and will be taken into consideration as soon as it overcomes the logistical hurdles. The program will bring hope to reproductive age patients facing fertility-threatening cancer treatments, and will fulfill Qatar's 2030 vision for establishing a world class healthcare system, and developing better approaches for the treatment of patients as well as securing a decent life for Qatar's current and future generations [9].

Conclusion

The ACU in HMC was the first center to introduce IVF services in Qatar. It has gained public confidence, and even with the opening with other IVF centers across the country in the recent years; HMC continues to be the major provider for this kind of service. It is characterized by high performing laboratories, which provide comprehensive ART services. The IVF outcomes of the unit are either equivalent or above the International benchmark. The unit is the only to provide publicly funded ART services for Qataris. The future of the ACU looks promising with its transition to the new location, which implies extending the services to a wider range of patients and the provision of new unique programs.

Abbreviations

ACU: Assisted Conception Unit, HMC: Hamad Medical Corporation, IVF: In Vitro Fertilization, ART: Assisted Reproductive Technology, IUI: Intrauterine Insemination, ICSI: Intracytoplasmic Sperm Injection, PGT: Preimplantation Genetic Testing, MESA: Microsurgical Epididymal Sperm Aspiration, TESA: Testicular Sperm Extraction, PESA: Percutaneous Epididymal Sperm Aspiration, PGT-M: Preimplantation Genetic Testing for Monogenic Disorders, PGT-A: Preimplantation Genetic Testing for Aneuploidy, QRI: Qatar Rehabilitation Institute

Competing interests

The authors declare that they have no conflict of interest.

Author's contribution

HB contributed to the literature review and wrote development of the manuscript. MS contributed to the information about the establishment of the unit. MS and MB revised the manuscript critically. All authors read and approved the final the manuscript.

References

1. Rutstein SO, Shah IH. Infecundity, Infertility, and Childlessness in Developing Countries. 2004:74
2. Al-Kuwari WD. Information Management Within the Nursing Department at Hamad Medical Corporation (HMC), Qatar: Loughborough University, UK; 2005.
3. Inhorn MC. Cosmopolitan conceptions in global Dubai? The emiratization of IVF and its consequences. *Reprod Biomed Soc Online*. 2016;2:24-31.
4. M. Shahata personal communication. Establishment of ACU. Personal Communication ed10 February 2020.
5. Del-Pozo-Lerida S, Salvador C, Martinez-Soler F, Tortosa A, Perucho M, Gimenez-Bonafe P. Preservation of fertility in patients with cancer (Review). *Oncology reports*. 2019;41(5):2607-2614.
6. Zanetti BF, Braga D, Azevedo MC, et al. Preimplantation genetic testing for monogenic diseases: a Brazilian IVF centre experience. *JBRA assisted reproduction*. 2019;23(2):99-105.
7. Ben-Nagi J, Serhal P, SenGupta S, Doye K, Wells D. Preimplantation genetic diagnosis: an overview and recent advances. *The Obstetrician & Gynaecologist*. 2016;18(2):99-106.
8. Treff NR, Zimmerman R, Bechor E, et al. Validation of concurrent preimplantation genetic testing for polygenic and monogenic disorders, structural rearrangements, and whole and segmental chromosome aneuploidy with a single universal platform. *European journal of medical genetics*. 2019;62(8):103647.
9. General Secretariat for Development Planning. Qatar National Vision 2030. 2008.
10. Gulf Research Center. Demography, migration, and labour market in Qatar 2014.
11. International Health Facility Guidelines. Part B-Health Facility Briefing & Design: 140 IVF Unit (Fertilization Centers) 2014 [cited 2020 16 February].
12. Rienzi L, Bariani F, Dalla Zorza M, et al. Comprehensive protocol of traceability during IVF: the result of a multicentre failure mode and effect analysis. *Hum reprod*. 2017;32(8):1612-1620.