Editorial

Fertility Services & Training: What the Future Beholds

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Abstract

The world of assisted reproductive technology is rapidly expanding worldwide with new improvements and constantly developed techniques. Two of the important factors affecting the success of any centre are the reproductive clinician and the embryologist. While training programme for reproductive clinician has been established, less so is said for embryologist. As the pioneer and leading fertility centre amongst universities in the country, Universiti Kebangsaan Malaysia Medical Centre (UKMMC) is making steps towards introducing a clinical embryology programme that is hoping to set a standard for embryologist training for the country and region. Fertility preservation is an area of assisted reproduction that is fast gaining recognition. It gives hope, especially to young oncologic patients for future reproduction. International success with ovarian tissue cryopreservation and reimplantation culminating with the first birth in 2004 gives hope to these patients. With the current plans of expansion and training of our reproductive centre, an oncofertility unit with ovarian cryopreservation facilities will be soon established to cater to the needs of the country.

Keywords: Assisted reproductive techniques; cryopreservation; embryology; fertility; training

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Introduction

The world saw the birth of Louise Brown, the first baby from in vitro fertilisation (IVF) technology in 1978 (1). Since then there has been a steady progression of advances to refine the technique with the birth of the first pregnancy from a frozen embryo in 1984 and the first pregnancy utilising a sperm from percutaneous epididymal sperm aspiration (PESA) procedure in azoospermic men by IVF in 1985. Another key development in IVF was the establishment of intracytoplasmic sperm injection (ICSI) of single sperms in 1992 (2). Universiti Kebangsaan Malaysia (UKM) started its fertility services in the 1990's in Hospital Kuala Lumpur. Since moving to our current hospital in 1998 there have been many developments in line with progress in the field of Assisted Reproductive Technology (ART).

Embryology Training

Two major factors affecting ART success are the clinician and the embryologist. Training for under the Ministry of Health (MOH) and this includes a 6-month attachment to the UKM reproductive unit. While the programme is the standard for MOH reproductive specialists, less so is said about embryology training. In the field of ART, the embryologist plays a key role behind the scenes. Amongst the responsibilities of the embryologist are maintaining the lab environment for the whole length of the embryo's development in the lab, making sure that the environment in the lab is similar to a woman's uterus, inseminating the oocytes to create embryos, freezing sperm, and oocytes to and embryos, grading, and monitoring embryos progress, performing laser biopsies of embryo cells for pre implantation genetic screening or diagnosis for genetic

diseases and many other future procedures that involves manipulation of ovaries and embryos.

Currently, there is no structured training or minimum qualification to become an embryologist in Malaysia. In line with the job scope, as described above, on-the-job training with a large portion of hands-on experience is required. Our centre has led the training of embryologists in Malaysia for many years. Since 2003 after our first two embryologist was sent for training in Singapore and Australia, we have trained our own embryologist from those holding the Science Officers post. Due to the demands of the field of ART in Malaysia and the setting up of IVF laboratories in MOH, we have received embryology trainees from MOH hospitals and individual applicants locally and internationally.

The Malaysia Healthcare Travel Council (MHTC), which facilitates and promotes the healthcare travel industry, is currently focusing on making Malaysia a healthcare tourism hub for assisted reproduction and cardiology. In order to promote Malaysia as a hub for assisted reproduction, certain standards had to be met. One of these would be the embryologist certification. At present there is no standard requirement or minimum qualification for one to be employed as an embryologist.

Coinciding with plans for our own clinical master in embryology program, a link-up was made by MHTC with Oxford University to review their embryology Masters's programme. Currently, plans are in place to start our Masters in Embryology in 2020 with the purview of Oxford University. An expansion of the service area of the current Reproductive centre is in the plans and will provide the space to incorporate the on-the-job experience required by our programme. There are plans to make the new Masters in Embryology by UKM/Oxford and the new minimum requirement for one to practice as an embryologist in Malaysia.

Fertility Preservation

One of the new areas of ART is Fertility Preservation (FP). It is the process of saving or protecting gametes or reproductive tissue so that a person can use them to have biological children in the future. People with certain diseases, disorders, and life events that affect fertility may benefit from FP. Amongst the indications for FP include various forms of cancer that require treatments, including chemotherapy using alkylating agents and pelvic radiation. More than 80% of children and adolescents with cancer survive until adulthood (3), fueling the interest in the long-term effects of oncology treatment on fertility. Non-oncological indications include those with autoimmune diseases; medical conditions causing premature ovarian insufficiency such as endometriosis; male hereditary disorders; testicular tissue problems and postponement of childbearing.

Traditional methods of FP include sperm cryopreservation in adult and adolescent males, while in women it includes both embryo and oocyte cryopreservation. However, this technique requires control ovarian stimulation, which requires time that may not be available for patients planning to undergo immediate cancer treatment. Other methods are gonadal shielding or ovarian transposition and using Gonadotrophin-releasing hormone analogues (GnRHa) to preserve follicles from damage during chemotherapy (4).

The last 15 years have seen the development and maturity of the ovarian tissue cryopreservation technique. It is currently the only FP option for pediatric patients as it can allow immediate cancer treatment. In 2004, the world welcomed the first birth from transplantation of cryopreserved ovarian tissue (5), and at present, there are more than a hundred babies born following this technique, with the figure continuing to increase. The number of births is so high that it is no longer considered experimental by experts in the field. An analysis of 60 cryopreserve tissue transplantation in Europe showed that over 90% of the women have some form of ovarian activity, which was first detected at a median of 4 months after replacement (6).

At present FP awareness amongst health care providers in Malaysia is still lacking. Furthermore, ovarian cryopreservation and transplantation facility is still in its infancy in most parts of Asia. The reproductive unit is in the midst of forming the oncofertility subunit for UKM Medical Centre (UKMMC) to urgently fill this void. There are several challenges that we hope to overcome. There is a need to establish a network amongst the target groups in order to get a fast referral and consultation time. Once this is established, a network of referrals is also hoping to be established nationwide. At present, UKMMC only lacks the ovarian cryopreservation facility for FP, which we hope to overcome by the year’s end. For the next 5 years, we foresee ourselves as being the referral center for the country for all these cases. The Denmark model for ovarian cryopreservation suits Malaysia the most in terms of cost-effectiveness. In this model, the surgery to retrieve the ovarian tissue can be done at the respective centers and transferred within the set time frame for storage in UKMMC. Elective re-

implantation at our centre can then be arranged years later once the need arises.

Conclusion

ART is a rapidly progressing and expanding field. We hope the establishment of our master's in Clinical Embryology and the setting up an oncofertility unit with ovarian cryopreservation facilities in UKMMC will further strengthen our stature as a leading reproductive unit in the region.

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