

12.3.14.1 INFORMATION ON INVITRO MATURATION OF HUMAN OOCYTES

Background

In vitro maturation (IVM) of human oocytes (eggs) involves the in vitro culture and maturation of oocytes that have been removed from the ovary at an immature state. Briefly, IVM involves collection of immature oocytes during the woman's natural cycle without any, or minimal preceding hormone treatment. Oocyte maturation takes place in vitro and fertilization of the mature oocytes is achieved using standard IVF or ICSI procedures.

Who might benefit from IVM?

IVM was developed to help selected couples where the female has polycystic ovaries (PCO) or polycystic ovarian syndrome (PCOS) or where the female might be at risk of ovarian hyperstimulation syndrome (OHSS). More recently it has proposed that IVM may be beneficial to a wider range of couples (eg male infertility, blocked tubes or unexplained infertility), although more research is required to test whether IVM would be beneficial for these couples.

Advantages of IVM

The major advantage of IVM is that it avoids the need to use hormonal treatments (gonadotrophins) that hyperstimulate the ovary in conventional IVF procedures. This is particularly beneficial to women who are at increased risk of OHSS, which can result from over stimulation of the ovary by the hormonal treatment. For example, women with PCO or PCOS are at increased risk of OHSS. By not using gonadotrophins the IVM treatment cycle is simplified and the potential side effects of these hormonal treatments are avoided.

Risks associated with IVM

In a small number of cases it may be necessary to make more than one puncture in the vaginal wall to ensure that all the available immature oocytes are collected from the ovaries.

There is a theoretical risk that oocytes might be at increased risk of imprinting errors due to the extended time in culture. Genomic imprinting is vital for many aspects of normal embryonic development and ongoing adult health. Fifty imprinted genes have now been identified in the human genome and it is expected that many more will be found in the future. Imprinting errors (errors occurring affecting the normal function of these genes) can cause developmental defects such as Beckwith-Weidemann syndrome. If you would like to read more about genomic imprinting please see "Genomic Imprinting and Reproduction, AKE Swales and N Spears; 2005; Reproduction Reviews". This article is available at Concept Fertility Centre on request.

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Children born after IVM

Although over 300 babies have been delivered after IVM and there has been no reports of an increased risk of abnormalities in the children born compared to conventional IVF/ICSI, there has been limited longer term follow up studies. Only two studies have reported follow up information. A two year developmental study found that of the 45 infants studied, all but one infant were in the normal developmental ranges up to 2 years of age. The other study reported on 48 pregnancies (45 single babies, one set of twins and one still born). Of the children born 26 were boys and 21 were girls. In 2005 the oldest child was 6 years of age and all children were reported to be healthy. Although these reports are encouraging, more follow up research is needed to fully assess the birth and long term outcomes in children born after IVM.

Considerations

IVM is a new procedure at Concept Fertility Centre and as such, no statistics regarding its effectiveness are available.

The results from units around the world suggest the pregnancy rate in women with PCO or PCOS is around 28% (range 22% – 51%) after using IVM.

If you have any questions regarding IVM please contact our Scientific Director on 9382 2388.