any study is done on culture medium effects in human. Neither the efficacy in terms of live birth rate, nor the safety for the resulting children is evaluated properly. Whether the reported cardio-metabolic effects in IVF children can, just as in animals, be attributed to culture medium is not known either.

Although much more knowledge on this topic is needed, current reported culture effects cannot be neglected anymore. Together with the manufacturers the current pre-implemented tests for newly developed culture media or for new additives should be reconsidered. In the IVF centres we should become more critical on which culture medium to use and evaluate the success rate by properly designed randomized controlled trials (RCTs), preferably in multiple centres in different countries. More importantly, a consistent follow-up of health parameters in the IVF children resulting from these RCTs is necessary to reveal culture medium induced health effects in human.

INVITED SESSION

Session 25: ASRM exchange session - Genetic and metabolic consequences for fertility in men and women

Tuesday 9 July 2013 08:30 - 09:30

O-095  Genetic and other controversies in the infertile male

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Today in the era of ICSI, relatively few infertile men are evaluated for the causes of their infertility beyond the routine semen analysis. In addition to the history and physical examination, genetic and endocrine evaluations, there are several additional tests that may be included as part of their routine evaluation. The importance of these tests for clinical decision-making is controversial. This lecture will highlight two such diagnostic quandaries: namely, the assessment of sperm DNA fragmentation and analysis of the rate of aneuploidy present in sperm. Genetic integrity is of utmost importance for the sperm. In addition to chromosomal aberrations, epigenetic modifications and mutations, DNA breakage may be present. The causes are likely multifactorial with a number of theories proposed. Although certain lifestyle issues such as smoking, heat, chemotherapy and occupational exposures can cause sperm DNA fragmentation, other conditions such as advanced paternal age have been largely overlooked. Yet evidence is accumulating to show a clear relationship between diminished genomic integrity in older aged men. A number of diagnostic tests are used to diagnose DNA fragmentation based upon either direct measurement of DNA strand-breaks or assessment of evidence of DNA breakage under a variety of physical conditions. Nevertheless, despite clear evidence of increased levels of DNA fragmentation in infertile men, from an evidenced based medicine perspective, well-controlled studies clearly showing a cause and effect relationship are lacking. Another underutilized test for evaluation of the infertile male is the Sperm “FISH” (fluorescent in situ hybridization) test for sperm aneuploidy. Numerical chromosome abnormalities of sperm from karyotypically normal infertile men are 10-fold more frequent as compared with fertile men. Sperm aneuploidy is more common in normospermic men who are partners with women with recurrent pregnancy loss and in men with oligotetrazospermia and severe oligospermia, yet this is rarely diagnosed. In conclusion, proper clinical and laboratory diagnosis of the infertile male is of critical importance in the evaluation and treatment of the infertile couple.

O-096  Metabolic alterations affecting fertility in women

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Metabolism and Reproduction are inextricably linked. Multiple micronutrients and other factors affect metabolism and in turn play a role in reproduction function. These include Vitamin D, adipocytokines and insulin; the latter two being most important with alterations in body weight. Among the adipocytokines, adiponectin appears to have an important role and influences ovarian function positively while affecting metabolism by decreasing insulin resistance. However in follicular fluid, levels are low and it is the leptin/adiponectin ratio which correlates closely with oocyte maturity and embryo development after IVF. Vitamin D deficiency has been linked to a poorer prognosis in IVF as well as being related to insulin resistance in women with Polycystic Ovary Syndrome PCOS), although more confirmatory studies are needed.

Obesity and metabolic syndrome adversely affect the reproductive axis leading to insulin resistance, anovulation and also potentially to oocyte oxidative stress and mitochondrial dysfunction, as well as endometrial dysfunction. This is most prevalent in women with PCOS. Here adipocytokine abnormalities and insulin resistance may be linked with anovulation, resistance to ovulation induction, an increased risk of ovarian hyperstimulation, as well as endometrial dysfunction. In women with PCOS, those with the most severe phenotype and metabolic dysfunction also have the worse pregnancy outcomes. While lifestyle measures are of paramount importance in treating such women, several therapies are also effective. Metformin which affects the ovary and endometrium independently, has a major role in lowering hyperglycemia and insulin resistance, but has only been found consistently to reduce the risk of ovarian hyperstimulation syndrome. Myo-inositol by increasing insulin sensitivity may also have a beneficial role in improving ovarian function and possibly oocyte quality. Cinnamon also has been found to reduce insulin resistance and may improve menstrual cyclicity in women with PCOS.

The control of abnormal metabolic factors by a variety of means is not only important for metabolic and cardiovascular health, but plays an important role in reproduction and pregnancy outcome.

INVITED SESSION

Session 26: Paramedical invited session – Laboratory: The embryo-endometrial interface – role in implantation/developmental success

Tuesday 9 July 2013 08:30 - 09:30

O-097  The contribution of the embryo

H. Van de Velde
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Implantation of a blastocyst is an absolute requirement for human reproduction. It is a complex process that involves cross-talk between the semi-allogeneic competent embryo and the receptive maternal endometrium within a transient time frame (window of implantation, WOI). Implantation can be divided into four stages: appro-pation, adhesion and invasion and vascularisation. Reproductive success is limited in the human. Even in IVF clinics, where artificial reproductive technologies (ART) are used to treat infertile couples, implantation is the limiting factor. In order to have successful implantation, the embryo has to develop into a competent blastocyst and the endometrium has to be synchronized into a receptive stage. The bidirectional communication between the embryo and the endometrium involves adhesion molecules, cytokines and immune cells. The tolerance of the semi-allogeneic embryo by the maternal immune system in the endometrium is not fully understood. The trophoblast cells do not express classical class I HLA-A and -B molecules but express classical class I HLA-C molecules and non-classical class I HLA-G molecules. The immune cells involved in implantation are uterine natural killer cells, dendritic cells and regulatory T cells. There seems to be a balance between the embryo aggressing the receptive endometrium on the one hand and the receptive endometrium inviting the embryo to implant on the other hand.

Despite all efforts, the highest implantation rate of high-quality blastocysts after ART is around 60% and not all high-quality blastocysts implant for reasons that are not well-understood. It is known that the ovarian stimulation protocols for oocyte recruitment and maturation may impair the receptivity of the endometrium, in