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A DECISION SUPPORT TOOL FOR OPTIMIZED PERSONALIZED DRUG DOSAGE PROFILES FOR ALL PROTOCOLS IN IN VITRO FERTILIZATION FOR BETTER OUTCOMES

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Abstract

Introduction: Superovulation is a drug-induced method to enable multiple ovulation per menstrual cycle and a key component towards a successful IVF cycle. Although there are the general guidelines for dosage, the dose is not optimized for each patient, and complications, such as overstimulation, can occur.

Methods: To overcome the shortcomings of this general system, a mathematical procedure and a decision support tool is developed which can provide a customized model of this stage regarding the size distribution of follicles obtained per cycle as a function of the chemical interactions of the drugs used and the conditions imposed on the patient during the cycle. Uncertainty and risk are modeled and included in optimal drug dosage decisions. This paper describes the theory, model, the optimal control procedure, and the decision support tool for improving outcomes of IVF treatment for all the four protocols used in real practice. The validation of the procedure is performed using clinical data from more than 100 patients previously undergone IVF cycles. Customized patient-specific model parameters are obtained by using initial two-day data for each patient. The models are then used for predicting the customized optimal drug dosage and estrogen levels for each patient. Two clinical trials were conducted in India.

Results: The results from the trials show that the dosage predicted by using the model is 40% less than the suggestion made by the IVF clinicians. The testing and monitoring requirements for patients using optimized drug dosage is reduced by 72%.

COI

Urmila Diwekar

A SIMPLE AND EFFICIENT SOLUTION TO ELIMINATE EVAPORATION IN MAMMALIAN EMBRYO CULTURES

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Abstract

Introduction: This abstract aims to offer a safe solution for a problem that compromises the quality of *in vitro*-produced mammalian embryos. The harmful effects of evaporation-induced osmotic changes in mammalian embryo cultures caused by the widespread application of dry incubators have been recognised only recently.

Methods: In this technical report, we describe a modified embryo culture dish (Humdish) consisting of a 60-mm-diameter round plastic Petri dish with a 25-mm-diameter central inner well, separated from the outer ring by a single-layer wall. The dish may store up to 13 and 4 ml fluids in the outer ring and the well, respectively. In the central well, 16 or 12 drops with 10 or 20 µl volume can be placed, then covered with an approximately 8 mm thick oil layer. The large amount of distilled water stored in the outer ring provides consistent >97% humidity and entirely eliminates osmotic changes in the oil-covered drops from Day 1 to 6.

Results: The recovery rate and stability of pH in the drops after preparation and incubation were identical with those measured in commonly used embryo culture systems. As an additional benefit, due to the warm water stored around the central well, the Humdish also increases the temperature stability of cultures. Our suggested approach may help to improve the *in vitro* environment and quality of all preimplantation stage mammalian embryos. The dish is easy to install, does not require an expensive investment and could be applied without delay in most embryology units.

COI

Wen Bin Chen: employee of VitaVitro Biotech that may be involved in production of Humdishes; Zoltan Machaty: N/A; Anabella Marconetto: N/A; Lodovico Parmegiani: N/A; Gabor Vajta: employee and founder of VitaVitro Biotech that may be involved in production of Humdishes

ALTERATIONS IN THE BIOCHEMICAL PARAMETERS AND THE SPERMATIC FUNCTION GENERATED BY OBESITY IN RATS

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Abstract

Introduction: The aim of the present study was to assess the effects of a hyperlipidic diet set before puberty in male Wistar rats' gonadal weights and testicular func[1]tions.

Methods: Males rats were used for the study, they were randomly distributed into 2 groups: Control Group: standard diet and the second: hyperlipidemic diet), after 7 days of experimentation, 3 rats were sacrificed per week, blood samples were collected and level of HDL, LDL and triglyceride were analyzed.

Results: A significant reduction ($p < 0.05$) in testicular weight in the control group was observed compared with the hyperlipidic diet group, Photomicrographie of the testicles of Wistar rats in the hyperlipid diet group for the first week showed Sertoli cell hyperplasia ,during the second week microscopic examination showed significant testicular hypertrophy the microscopic examination during the fifth week showed hyperplasia of the seminal vesicle characterized by an increase in the number of glandular epithelial cells. The proliferating epithelium may form papillary structures with supporting stroma and with extension into the glandular lumen and total absence of sperm cells. The hyperlipidic diet affects the gonads significantly with hypertrophic testes, the presence of hyperplastic seminiferous tubes, as well as a fine basement membrane in testicular weight in the control group was observed , triglyceride levels showed a consistent change over the weeks of the study, Photomicrographie of the testicles of Wistar rats in the hyperlipid diet group for the first week showed Sertoli cell hyperplasia, during the second week microscopic examination showed significant testicular hypertrophy the microscopic examination showed hyperplasia of the seminal vesicle characterized by an increase in the number of glandular epithelial cells. The proliferating epithelium may form papillary structures with supporting stroma and with extension into the glandular lumen and total absence of sperm cells.

Conclusions: Obesity is associated with many metabolic abnormalities and induce disorders of spermatogenesis.

COI

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ANALYSIS OF IVF/ICSI OUTCOMES OF ENDOMETRIOSIS PATIENTS WITH REPEATED IMPLANTATION FAILURE: INFLUENCE OF GnRH-A ON ENDOMETRIOSIS

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Abstract

Introduction: An ambispective cohort study was performed and IVF/ICSI outcomes were compared to study the effect of down-regulation of GnRH-a on endometriosis patients with repeated implantation failure (RIF) when undergoing *in vitro fertilization (IVF)/intracytoplasmic sperm injection (ICSI)*.

Methods: 330 patients with endometriosis were enrolled, including 1043 cycles. All patients were diagnosed with RIF. Based on whether GnRH-a was used for down regulation, patients were divided into two groups, including the Down-regulation group and Non-down-regulation group. Patients were also categorized by the management of endometriosis that is: untreated group, dissatisfactory-controlled group and well-controlled group. The clinical pregnancy rate, early abortion rate and live birth rate were the main outcomes.

Results: Patients in Down-regulation group had a higher clinical pregnancy rate and live birth rate than patients in Non-down-regulation group (34.24% vs 26.05%; 33.78% vs 19.47%, separately). After adjusting the confounders by logistic regression analysis, the clinical pregnancy rate was 1.829 times, and live birth rate was 1.757 times than that in Non-down-regulation group. We then used ROC curve analyses to determine the most appropriate time interval between the management of endometriosis and IVF/ICSI treatment. We consider 11.5 months is the effective period of endometriosis treatment in consideration that endometriosis would become active again after said period. Based on endometriosis activity, we also divided patients into the untreated, the dissatisfactory-controlled, and the well-controlled groups. Patients were further stratified by the usage of GnRH-a for down-regulation. There was a significant increase in success rate in the well-controlled group after GnRH-a down regulation. After adjusting confounders, in the well-controlled group, the clinical pregnancy rate after down regulation was 1.961 times and the live birth rate was 2.186 times that of the non-down-regulation group, the difference was statistically significant.

Conclusions: Down regulation by GnRH-a can improve pregnancy outcomes in patients with endometriosis and diagnosed with RIF. The effective duration of treatment in patients is 11.5 months. Our study suggested that only when the activity of endometriosis is well controlled, can the down regulation protocols help RIF patients achieve better pregnancy outcomes. Therefore, it is necessary for patients with RIF to control endometriosis activity before IVF/ICSI treatment.

COI

N/A

ASSOCIATION BETWEEN OOCYTE MORPHOLOGICAL VARIATIONS AND EMBRYO DEVELOPMENTAL COMPETENCE

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Abstract

Introduction: The developmental competence of an embryo depends on several factors, among which oocyte quality plays a crucial role. However, there is still no clear evidence of the effect of oocyte morphological variations on embryo development and pregnancy. This study aims to assess the impact of extra and intra-cytoplasmic variations on the fertilization rate, embryo quality, cryosurvival and pregnancy outcomes in ART cycles.

Materials and Methods: The retrospective study included patients undergoing ART-ICSI cycles from March 2018 to March 2021 at Kasturba Hospital, Manipal, India, after IRB approval. Male factor infertility cases were excluded from this study along with ICSI with donor oocytes, ICSI with vitrified oocytes and also IVF cycles. Oocyte morphological variations were categorized into extra and intra-cytoplasmic variations prior to ICSI and embryo development, cryosurvival and pregnancy was followed up from patient records. Statistical analysis was performed using Statistical Programs for the Social Sciences (SPSS Inc., version 25) software.

Results: A total of 267 cycles were included in which the mean age of the female patients was 32±4 yrs, and a total of 2018 Metaphase II oocytes were retrieved. The results showed a significant impact of fragmented polar body on the fertilization rate ($p=0.016$) while the presence of multiple vacuoles significantly effected embryo quality of day 3 embryos ($p=0.002$) and day 5 embryos ($p=0.019$). A similar trend was seen in association with pregnancy where polar body abnormalities ($p=0.04$) and large vacuoles ($p=0.009$) significantly impacted the pregnancy rates.

Conclusions: This study showed that of all the oocyte morphological variations, polar body defects and presence of vacuoles can adversely affect embryo developmental competence and pregnancy outcomes. Oocyte evaluation still remains a necessary step prior to ICSI and should be used in conjunction with embryo grading for selection of best embryos for transfer. Since our sample size was small, these findings need to be further validated with a larger sample size and followed up with ongoing pregnancy and live birth rates.

COI

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BUILDING, CALIBRATION AND VALIDATION OF EMBRYOHUB: MULTIMODULE PLATFORM FOR EMBRYO ASSESSMENT BY ARTIFICIAL INTELLIGENCE

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Abstract

Introduction: Previous morphokinetic studies used to compare implanted embryos to non-implanted embryos, but a certain number of embryos may have been misclassified as implantation could not only be caused by the embryo. The aim of this study was to build, calibrate and validate the EmbryoHub, a multimodule unifying platform for embryo assessment, to classify embryos as Favourable or Unfavourable Profile based on the similarity of each embryo with respect to the only two verifiable levels (not even not exclusive but prioritizable): Live Birth vs Aneuploid.

Materials and Methods: A retrospective observational study was performed with 274 embryos from 113 patients undergoing ICSI cycles at Conceptum. 186 known result embryos were selected for building and calibration phase (96 KBD, 90 Aneuploid PGT-A D+3), and 88 transferred embryos with known result composed the validation phase. All embryos were monitored in Primo Vision and time-lapse (TL) features were annotated until day 3. Building phase consisted in analysing the performance of every embryo assessment approach (called module) to compare and profile known birth data embryos and aneuploid embryos. Calibration phase involved ordering the previous phase significative features and creating a decision tree. Every embryo was predicted in LOOCV (Leave-One-Out Cross-Validation), Logistic Regression and Confusion Matrix was performed. On the Validation phase, Implantation Rate (IR), Logistic Regression, Confusion Matrix and Receiver Operating Characteristic (ROC) were computed for all-transfers, splitting D+3 and D+4/D+5/D+6 transfers.

Results: EmbryoHub platform contained 3 modules: Morphodynamics, KBD-Morphokinetic Range and an AI Morphokinetic Predictive Model ensembling 6 supervised machine learning cross-validated algorithms.

Overall IR was 25% (22/88), when splitting by day of transfer, $IR_{D+3}=21,4\%$ (12/56) and $IR_{D>D+3}=31,3\%$ (12/32). Favourable predicted embryos got 39,5% on overall IR (17/43) while Unfavourable embryos got 11,1% (4/45). For D+3 prediction, $IR_{Favourable}$ was 27,6% (8/29) and $IR_{Unfavourable}$ was 14,8% (4/27). However, for D+4/D+5/D+6 embryo transfers $IR_{Favourable}$ was 64,3% (9/14) and $IR_{Unfavourable}$ was 5,6% (1/18), Odds Ratio (OR) = 30,6 (95% Confidence Interval (CI), 3,09 – 303,38) and AUC = 0,836 (95% CI 0,704-0,969).

Conclusions: Building a multimodule embryo assessment platform focused on the comparison between KBD and aneuploid could be useful to improve ART success rates.

COI

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COMPARISON OF DELAYED AND IMMEDIATE REMOVAL OF EMBRYO TRANSFER CATHETER AFTER EMBRYO DEPOSITION ON PREGNANCY OUTCOME.

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Abstract

Objective: Embryo transfer (ET) is the final step in an Assisted Reproduction Technology (ART) either in In-Vitro Fertilisation (IVF) or Intra-Cytoplasmic Sperm Injection (ICSI). It is influenced by endometrial receptivity of uterus, endometrium thickness, quality of embryos and other factors. In this study, we aim to compare the result of delayed time interval before removal of the ET catheter with that of immediate removal of ET catheter after embryo deposition.

Methods: A retrospective study on 253 patients less than 40 years old who underwent IVF/ICSI and proceed to frozen embryo transfer procedure in our centre from 2017-July 2021 were conducted. The data collected were sorted into two groups; Group A involves immediate removal of ET catheter after embryo deposition of less than a minute (n=141) while Group B involves removal of ET catheter after embryo deposition of more than a minute (n=112). The clinical pregnancy rate (CPR), miscarriage rate (MR) and implantation rate (IR) were analysed using Chi-square test with significance level at p-value <0.05. Patients' characteristics such as age factor, number of retrieved oocytes, length of stimulations days, and cause of infertility were compared and there are no significant difference between Group A and Group B.

Results: The CPR obtained was 47.43% (120 out of 253), whereas the IR was 80.99% (115 out of 142) and MR was 26.67% (32 out of 120). The comparison of reproductive outcomes revealed that there were significance difference in CPR (41.84% vs 54.46%, p-value=0.045) and IR (70.27% vs 92.65%, p-value=0.0007) when the ET catheter is removed at less than a minute and more than a minute after embryo deposition. However, there was no significant difference in MR (25.42% vs 27.87%, p-value=0.805) between the two groups.

Conclusions: Based on our data, it was shown that the CPR and IR is higher in Group B. Delaying removal of ET catheter may help in stabilizing the uterus by reducing the contractions, thus improving the pregnancy outcome. However, a larger study will be better to further verify this statement as there are many other external factors.

COI

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COMPARISON OF EMBRYO QUALITY OF BLASTOCYSTS CULTURED IN VERTICAL INCUBATORS WITH DIFFERENT OXYGEN CONCENTRATION

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Abstract

Introduction: Embryo culture conditions are essential to ensure embryo viability and success of in vitro fertilization. Oxygen concentration in which embryos are routinely cultured (20%) would compromise parameters such as blastocyst rate (Gardner and Kelley, 2017), which can be improved by culturing in a low oxygen concentration (5%) Ciray et al. (2009). Several incubators available on the market provide this reduced oxygen tension, the so-called tri-gas.

Objective: This study aimed to verify if there was a difference in the development rate of blastocysts cultivated in vertical tri-gas incubators and conventional incubators.

Materials and Methods: We compared the embryonic development of assisted reproduction cycles of 120 patients, in which after the procedure of intracytoplasmic sperm injection into eggs, half of the samples continued in culture using atmospheric oxygen (20%), while the other half continued in culture containing reduced oxygen (5%). On day 5 of development, we verified how many embryos from each incubator reached the blastocyst stage.

Results: There was no significant difference in the blastocyst development rate between vertical incubators with different oxygen tensions. Of the 120 cases analyzed, a total of 520 blastocysts were obtained, of which 268 were in an incubator with 5% O₂ (51%), while 252 were in an incubator with 20% O₂ (48%).

Conclusions: The decision to use low O₂ concentration implies changes in laboratory practices with financial repercussions. Our study revealed no difference between the evaluated incubators, which may be related to the inability of vertical tri-gas incubators to recover stability during use, showing no benefits in terms of additional cost. Despite the amount of data regarding the negative effects of atmospheric oxygen on embryos, there is no doubt that to minimize these effects through the use of certain technologies, the first step is a good choice of equipment.

COI

Darlete Lima Matos N/A, Daniel Paes Diógenes de Paula N/A, Lilian Sérgio N/A, Karla Rejane de Oliveira Cavalcanti N/A, Fabrício Martins N/A

DOES CYTOGENETIC ANALYSIS OF THE PRODUCTS OF CONCEPTION (POC) SHED LIGHT ON THE TYPES OF NUMERICAL ABERRATIONS IN EMBRYOS TESTED BY PREIMPLANTATION GENETIC TESTING FOR ANEUPLOIDY (PGT-A)?

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Abstract

Objective: To understand the differences in the common chromosomal abnormalities detected in the POC and in aneuploid embryos.

Materials and Methods: 2885 blastocyst stage embryos obtained through intracytoplasmic sperm injection (ICSI) were subjected to PGT-A by next generation sequencing (NGS). 830 samples of POCs were analyzed using G-banded conventional karyotyping for chromosomal aneuploidies.

Results: PGT-A and Karyotyping showed aneuploidies in 46% (1337/2885) of embryos and 36.9% (306/830) of tissue respectively. Preimplantation embryos showed numerical aneuploidies of all 23 pairs of chromosomes, whereas POC did not show any involvement of chromosomes 1 and 3. Table 1 demonstrates the percentage of common aneuploidies for chromosomes 13, 15, 16, 18, 21, 22 and sex chromosomes.

	chr 13	chr 15	chr 16	chr 18	chr21	chr 22	sex chr
POC	8.20%	4.90%	5.90%	6.20%	8.50%	8.50%	27.12%
PGT-A	11.20%	7.30%	10.70%	8.20%	9.90%	9.40%	3.52%

It was found that there was a slight increase in the percentage of aneuploidies found in autosomal chromosomes 13, 15, 18, 21 and 22 with an almost double increase in chromosome 16 aneuploidies in PGT embryos compared to POC samples. Interestingly the rise in sex chromosome aneuploidies was almost 7 times more in POC than in embryos. Triploidy and tetraploidy was visible in POC cases but not found in embryos.

Conclusions: Common chromosomal aneuploidies were present in slightly higher percentages in embryos when compared with POC. Triploidy seen in POC could be diandric (diploid sperm) or digynic (diploid ovum) in origin and lack of this by PGT-A may be due to the injection of a single sperm into MII grade oocyte at the time of ICSI. Absence of tetraploidy in embryo but presence in POC may be due to the confined placental mosaicism (failure of cytokinesis). It was also possible that triploidy and tetraploidy were missed due to sensitivity of NGS platform used.

Impact Statement: Chromosomal aneuploidies are the main contributing factors for miscarriages. In exceptional cases when only mosaic embryos with these chromosomal aneuploidies are available for transfer, it may be prudent to counsel couples about the risk of miscarriage.

COI

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EFFECT OF CIGARETTE SMOKING ON SPERM COUNT AND MICRODELETIONS OF THE Y CHROMOSOME IN INFERTILE MEN ALGERIAN

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Abstract

Objective: Our objective is to assess the frequency of microdeletions of the Y chromosome in infertile Algerian men in the West region and to determine a difference between semen parameters in smoking and non-smoking patients.

Methods: We studied the epidemiological aspect of 377 infertile men in the central Algerian region, of which we focused on the effect of smoking tobacco on the quality of sperm, our study population consisted of 165 men no mokers and 212 male smokers, the study was carried out at the assisted reproduction center of the (Parnet) in the capital of Algiers between March and November 2018.

A genetic study was carried out on 53 infertile men with azoospermia and oligospermia, a search for the microdeletion of the Y chromosome was carried out by conventional PCR, the research is carried out on three regions of the Y chromosome AZFa, AZFb, AZFc.

Results: Sperm concentration, percent motility, and morphology were significantly lower in a group of infertile smokers than in the group of infertile non-smokers. We also observed that the duration of infertility was significantly increased ($p < 0.05$) with age in a group of infertile smokers. Our study shows that smoking is associated with a decrease in sperm count and motility. The results of the microdeletions present a deletion in 6 patients. This study shows the search for genetic causes must be strengthened for the current management.

COI

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EFFECT OF METFORMIN ON DEVELOPMENTAL POTENTIAL OF PRE-IMPLANTATION STAGE EMBRYO FROM POLYCYSTIC OVARIAN SYNDROME MOUSE MODEL

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Abstract

Introduction: Metformin is a dimethyl biguanide used for the treatment of diabetes mellitus and polycystic ovarian syndrome (PCOS). It is an adenosine 5'-monophosphate activated protein kinase (AMPK) activator and can also cross through placenta. Since metformin administration is continuous in women with PCOS (before and during conception), there is possible adverse effects on oocytes, embryonic development and fetal physiology. The present study was aimed at understanding the effect of metformin on early embryo development in mice with experimentally induced PCOS.

Materials and Methods: For the study, mice were subcutaneously injected with dehydroepiandrosterone (DHEA) for 21 days to establish PCOS condition and were treated with 200 mg/kg body weight of metformin for 28 days intraperitoneally. The mice were superovulated, oocyte cumulus complexes (OCCs) were collected from the oviduct and in vitro fertilization was performed. After 12 h, the OCCs were denuded and normally fertilized oocytes were cultured in M16 media till the blastocyst stage. Cleavage rate, blastocyst rate, total cell number, DNA damage and E-cadherin expression in blastocysts were assessed.

Results: The average number of OCCs were significantly higher in metformin group when compared to control ($P<0.01$). Fertilization rate did not vary in any of the groups in comparison to control. However, PCOS group showed a significant decrease in blastocyst rate ($P<0.0001$) and total cell number ($P<0.01$) compared to control, which was higher in metformin group. E-cadherin expression was decreased in PCOS embryos compared to control, which was found to increase following metformin administration.

Conclusions: These results suggest that PCOS conditions can have adverse effects on early embryo development and metformin improves the developmental potential. However, further experiments on gap and tight junction proteins and foetus development are required to validate the beneficial role of metformin.

COI

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ESTABLISHING AND DISCUSSING GRADED SONIC HEDGEHOG EXPRESSION DURING HUMAN EMBRYO SPINAL CORD PATTERNING

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Abstract

Introduction: Neurons of the developing spinal cord are organized into automatically and functionally distinct progenitor domains which are induced and patterned by adjacent organizer centers: the non-neural ectoderm and notochord, respectively. Secreted signals, known as morphogens, act in developing tissues to control the temporal and spatial arrangement of cellular differentiation. One such example is the morphogen Sonic hedgehog (Shh), a member of the hedgehog family of secreted signaling proteins. Shh signaling mediates the long-range patterning activity of the notochord and specifies five distinct domains of neuronal progenitors and a second organizing center of Shh activity within the floor plate of the spinal cord at ventral midline. The graded activity of Shh within of tissues exposes cells to different signal levels and leads to region specific transcriptional responses and cell fates.

Materials and Results: In our study we comparatively evaluated Shh expression in dorsal and ventral parts of the developing spinal cord. The human embryos of Carnegie stages (CS) 14 to 20 were embedded in paraffin and cut serially in transversal direction. Shh was detected by immunohistochemical staining. Spatial and temporal expression pattern of Shh was seen in the forming spinal cord – higher expression in the ventral and lower expression in the dorsal part. Shh expression was noticed to decrease throughout the later stages of the spinal cord development and significantly stronger expression was found at CS 14-16 compared to CS 18-20. Shh expression was observed in the roof and floor plate, and in the ventricular, mantel and marginal layers of developing spinal cord. Statistically stronger immunostaining intensity of Shh was detected in the floor plate as compared to roof plate at all studied stages. Furthermore, spatially restricted expression of Shh was found along the compartmental dorsal-ventral axis of the spinal cord as Shh staining was stronger in the ventricular layer of the ventral part of the developing spinal cord compared with area of dorsal part.

Conclusions: Shh protein expression of human embryos mostly resembles descriptions of the role of Shh in neurogenesis of animals where Shh is associated with the establishment of ventral-dorsal boundaries within the developing neural tube.

COI

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EVALUATION OF INTRA-OVARIAN PLATELET-RICH PLASMA ADMINISTRATION ON OOCYTES-DEPENDENT VARIABLES IN PATIENTS WITH POOR OVARIAN RESPONSE: A RETROSPECTIVE STUDY ACCORDING TO THE POSEIDON CRITERIA

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Abstract

Introduction: Poor ovarian response (POR) is among the common findings in infertile women with no significant underlying condition. The aim of this study was to investigate the intra-ovarian potential of platelet-rich plasma (PRP) administration on oocytes- dependent variables in the POR women grouped according to the POSEIDON criteria.

Methods: This retrospective study was performed on POR women with no underlying condition who have undergone intra-ovarian PRP injection. As well as patients' age, the number of total and MI, MII, and GV oocytes were extracted from the files. The laboratory variables including anti-mullerian hormone (AMH), follicle-stimulating hormone (FSH), luteinizing hormone (LH), and estradiol were also gathered. In order to reduce any bias due to the possible differences in kits or devices, a single laboratory with the highest number of cases were was selected and others were excluded from the study. Then, the included cases were grouped into four according to the POSEIDON criteria and analyzed for the mentioned variables by SPSS, version 25. The statistical significance level was considered set as P-value< 0.05.

Results: From 383 cases, a total number of 96 women were enrolled in this study. According to the POSEIDON criteria, group 4 (Age ≥ 35 years, AMH < 1.2 ng/mL) with the ratio of 56/96 (58.3%) had the highest prevalence among the others. As the analyses showed, changes in the laboratory variables (LH, FSH, AMH, and estradiol) were not significant in almost all the groups following the intervention. Regarding the total oocytes number, PRP administration caused a significant increase in the total number in all the groups (all $P < 0.05$). Also, the number of MII oocytes was significantly increased following the treatment in all groups except for group 2 (Age ≥ 35 years, AMH ≥ 1.2 ng/mL; all $P < 0.05$). Of 96 cases, 14 (14.6%) got clinically pregnant following assisted reproductive techniques which the this number were significantly differed among the groups ($P = 0.002$).

Conclusions: This study showed that PRP treatment was effective on total and MII oocyte numbers in the patients with POR, however, further studi

COI

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EVALUATION OF PREGNANCY RATE IN PATIENTS AFTER UTERINE SEPTUM RESECTION

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Abstract

Objectives: To evaluate the pregnancy rate in patients undergoing septum resection with primary or secondary infertility, recurrent miscarriages

Materials and Methods: This study was performed at University Clinic of Ob/Gyn, Skopje, in a period from January 2019 until January 2020. A hysteroscopic septum resection was performed in 36 patients, previously diagnosed with 2D / 3D ultrasound and HSG. The resection was performed with a bipolar resectoscope (Storz), under short-term intravenous anesthesia. The intervention was followed by administration of hormone replacement therapy for several cycles. After the procedure the pregnancy outcome was monitored until second trimester of eventual pregnancy.

Results: Clinical pregnancy was reported in 25 patients (64.5%), biochemical pregnancy in 4 patients (0,2%) and miscarriage in 7 patients (35.3%).

Discussion: Uterine septum is a common cause of infertility and the inability to develop a normal pregnancy, as well as fibroids and uterine polyps. These conditions makes deformations of the uterine cavity, reduces its capacity, increase possibility of misscarriages and spontaneous abortions. With hysteroscopy and septum resection, excellent results are achieved. The intervention is followed by administration of hormone replacement therapy for several cycles, after which spontaneous or assisted pregnancy by using ART procedures can be expected.

Conclusions: Hysteroscopic septum resection is an effective and safe method. This intervention increases the pregnancy rate. Moreover, because of its simplicity, minimal invasiveness and low morbidity, it is considered as a method of choice for the treatment of uterine abnormalities which improves reproductive outcome.

Keywords: hysteroscopic resection, pregnancy, infertility, uterine septum

COI

Viktorija Jovanovska N/A, Slagjana Simeonova Krstevska N/A, Drage Dabeski N/A

EVALUATION OF THE QUALITY OF LIFE OF WOMEN WITH INFERTILITY ACCORDING TO THE FERTILITY QUALITY OF LIFE (FertiQoL) TOOL

Omar, Meruyert¹

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Abstract

Introduction: The World Health Organization (WHO) has recognized infertility as a public health problem worldwide. The prevalence of infertility in the general population is 9%, and only 1/2 of infertile couples seek medical attention. The aim of the study is to evaluate the quality of life and psychoemotional status of women during ART treatment using the international questionnaire FertiQoL.

Materials and Methods: Inclusion criteria for the study: 1) women aged 18-45; 2) infertility diagnosis; 3) infertility treatment by ART. The sample size was calculated for 100 patients. The reference form covered socio-demographic status, characteristics associated with fertility. Data from questionnaires were entered into SPSS version 26.0 for aggregation and statistical analysis. A t-test was used for independent samples To compare the results on subscales (Emotional, Mind /body, Relational, Social, Environment, Burden, Core FertiQoL, Treatment FertiQoL). One-way ANOVA was used for comparison between groups on demographic characteristics and on the scale of results. A $p \leq 0.05$ value was considered statistically significant.

Results: The mean Core FertiQoL and Treatment FertiQoL were 66.24 ± 12.52 and 73.12 ± 13.21 , respectively. The Cronbach $\alpha > 0.7$. FertiQoL scores were statistically significantly higher in the group of persons who had children than in the groups with primary infertility in three areas, Emotional, Mind/body, Relational ($p < 0.05$). In the group without children, the relationship with the partner was better than in the group with children (74.53 ± 26.75 and 66.0 ± 33.15 , respectively). In women whose reason was the absence of a sexual partner, the Mind/Body scale was lower than other factors of infertility, close to statistically in the Emotional and Treatment FertiQoL scales, respondents with a male factor of infertility had the lowest indicators, close to significant ($p < 0.08$).

Conclusions: In general, assessment of quality of life and satisfaction with treatment should be a standard routine in ART centers and can be complemented by targeted psychological interventions that can reduce the burden and improve the quality of life of patients, taking into account the different stages of treatment. Consistent with this, researchers A. Domar, J. Gross, J. Boivin reported that the interaction of cognitive coping and relaxation significantly increases the positive impact on ART treatment.

COI

Meruyert Omar, Vyacheslav Lokshin, Nataliya Glushkova

FROZEN EGGS - AN ANALYSIS OF GLOBAL TEMPORAL TRENDS OF OOCYTE CRYOPRESERVATION AND REPRODUCTIVE OUTCOMES

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Abstract

Introduction: In the past decade with technological advances and reproductive preferences, oocyte cryopreservation (OC) has developed into a sought-after assisted reproductive technology (ART) globally for autologous and donor oocytes. This led to recent announcement by UK government on 6.9.2021 to extend egg freezing storage limit to 55 years. It is pertinent to know current OC practice and reproductive outcomes across different countries for informed decision-making.

Objectives: To review OC temporal trends globally, and assess its effectiveness as an ART based on available national databases i.e HFEA(UK), SART(USA), ANZARD(Australia and New Zealand, ANZ), CARTR(Canada), JSOG(Japan), RLA(Latin America) and Europe; Q-IVF(Sweden), IARTR(Italy), BELRAP(Belgium).

Materials and Methods: Retrospective exploratory data analysis of transnational ART data registries of OC outcomes (2010-2019) was performed for temporal trends for oocyte freeze cycles, oocyte thaw (OT) cycles & live birth rate (LBR) outcomes.

Results: A notable increase in number of OC cycles per annum globally was demonstrated with an increase of ~1328% from 913 (2010) to 13041 (2018) cycles in USA; UK (916%, 2010-2019), ANZ (860%), Canada (397%), Sweden (270%), Belgium (2010%), Japan (72%, 2015-2018) and 198% rise in Latin America.

OT cycles also saw an upward trend, with ANZ seeing a 267% rise (2010-2015). In UK (2010-2016), 255% rise in own OT cycles but a dramatic 20-fold (2053%) rise in donor egg thaw cycles. In Italy, a decline from 2441 (2010) to 1318 (2018) OT cycles was observed secondary to probable lifting of ban on embryo freezing in 2009, thereby offering alternative to OC.

The utilization rate indicated one thaw cycle per 25 OC cycles in the USA, 1 in 10 (UK) and 1 in 8 (ANZ).

LBR trends has remained consistent over years in each country and remains low using own eggs varying between 8-25% across different ART registries. Donor thawed oocytes had a greater LBR (31%) compared to autologous OT cycles (22%) in the UK.

Conclusions: Availability of national registries are crucial for worldwide snapshot of ART outcomes to counsel women. In essence, although OC techniques are becoming more common, LBR for frozen eggs remains low varying greatly between frozen donor vs autologous oocytes.

COI

Aryan Chaudhary - N/A, Pari Mehlawat - N/A, Dr. Meenakshi Choudhary - The data presented is a part of an article write-up by MC for Cooper Surgical.

HUMAN CHORIONIC GONADOTROPIN IN SPENT EMBRYO CULTURE FLUID - A BIOMARKER FOR IDENTIFYING A COMPETENT EMBRYO FROM THE COHORT

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Abstract

Introduction: To achieve the goal of a single live birth following IVF, it is necessary to identify which embryo from the cohort has the greatest potential to give rise to a healthy baby, and that embryo can then be transferred. Human chorionic gonadotropin (hCG) is primarily produced by the embryo which can be detected in the spent embryo culture fluid (SECF) during embryogenesis.

Materials and Methods: Standard assays for hCG are not sensitive to measure it in the SECF and therefore a Disk ELISA procedure was developed following optimization with commercially purchased hCG. 2.5 µL of SECF and hCG standards were deposited on 5mm nitrocellulose membrane disks that were coated with capture antibody and followed with HRP-conjugated detection antibody. The disks were washed, mixed with chemiluminescent reagent, and incubated for 5 minutes. The luminescence was read at 470 nm and results calculated using a 4-parameter curve based on the hCG standards.

Results: A total of 84 SECF from 22 patients had more than one embryo developed to a blastocyst on Day 5. Sixteen embryos selected based on morphological criteria and with trophoctoderm ploidy were transferred resulting in 12 pregnancies, 3 biochemical and 1 non pregnant. Six pregnancies were with an embryo that had the highest hCG among the cohort and in seven; hCG was higher than the lowest among the cohort. One non pregnant patient who was transferred with an embryo with low hCG (1.7 pg/ml) became pregnant following transfer with a cohort embryo with higher hCG (3.5 pg/ml). Two patients with biochemical pregnancies were with embryos that had lowest hCG levels in their cohort. Overall average hCG was 3.0 ± 1.4 pg/ml with the 95% confidence level of 0.59 (range: 2.4 to 3.6). Fifteen of the 22 patients had their mean hCG values outside the 95th percentile.

Conclusions: hCG concentrations in the SECF may best be used to select an embryo among it's cohort that has the greatest potential to result in pregnancy. Further studies are needed to determine the clinical usefulness of this novel technology for selecting the most competent embryo from the cohort.

COI

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IMPACT OF DIET AND OBESITY ON INFERTILITY IN ALGERIAN WOMEN (WEST OF ALGERIA)

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Abstract

Objectives: The objective of this study is to research the impact of diet and obesity on the fertility of a population of Algerian women. Also, to establish if there is a correlation between the dosages of trace elements (zinc, copper and iron, magnesium) and vitamin B12 in follicular fluids and the dietary status of patients.

Methods: The study was prospective. A standard questionnaire was established and the following parameters were determined (FSH, LH, AMH, zinc, iron, copper, magnesium). The food survey was not neglected in this study.

Results: The study revealed that (39.40%) of the patients in our study were overweight and (46.4%) were considered obese. There was no statistical difference between the different categories of BMI (normal, overweight and obese) and hormone profile ($p>0.05$). A strong positive correlation was noted between age and AMH ($p=0.02$). Concerning the dietary survey, our study revealed excessive intakes of simple carbohydrates, a diet that remained too low in complex carbohydrates and fiber, and insufficient intakes of omega-3. Also a deficiency in iron, potassium and sodium was noted. In fact, the dosages carried out in the follicular fluid showed a better correlation between the levels of dietary trace elements in relation to the levels of trace elements in the follicular fluid of infertile women.

Diet and the quality of the follicular fluid are two key elements to be taken into account in the management of infertile couples.

COI

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IMPACT OF SERUM PROGESTERONE VALUE ON EMBRYO TRANSFER TIMING AND PREGNANCY RATE

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Abstract

Introduction: *Progesterone* is one of the steroids hormones, which performs an essential function in many tissues other than the reproductive system, like in the mammary gland, to prepare the glands for breastfeeding, the cardiovascular system, central nervous system and bones.

Serum Progesterone and Embryo Transfer

Several early studies suggested the importance of luteal phase support in frozen cycles, which has shown that progesterone's supplementation does impact the outcome in frozen embryo transfer. Progesterone (P4) is needed for successful embryonic implantation into the endometrium and support of the pregnancy in natural cycles, fresh in vitro fertilization cycles, and frozen embryo transfer (FET) cycles.

Progesterone Function

P4 is an intrafollicular steroid that performs an essential role in ovulation, implantation, and pregnancy support and maintenance. P4 is short and elevated at 18 hours following the luteinizing hormone (LH) surge release; in addition, P4 is the main content of follicular fluid steroids in mammalian preovulatory follicles. P4 was initially being considered as a contraceptive factor through reducing the luteinizing hormone surge and ovulation.

Conclusions: Progesterone is essential for establishing and maintaining embryo implantation and pregnancy; also, P4 is used for luteal phase deficiency in infertility treatment. Yet, progesterone therapy's optimal timing and dose can influence the impact of P4 on pregnancy. Also, low or elevated P4 level can negatively impact embryo transfer timing and pregnancy rate. M. Zakaria et al 2021

COI

N/A

IN VITRO FERTILIZATION RESULTS ACCORDING TO INFERTILITY CAUSES

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Abstract

Introduction: The results of assisted reproduction treatments are associated with multiple factors, including the cause of infertility. The objective of this study was to evaluate the impact of the presence or absence of different infertility causes in the outcomes of in vitro fertilization.

Materials and Methods: Retrospective cohort study, including 1895 IVF cycles performed in a Brazilian reproductive center. The impact of the presence of masculine factor (MF), tubal factor (TF), endometriosis (END), ovarian factor (OF), and unexplained infertility (UI) was analyzed, regarding the mean total oocytes, mature oocytes, fertilization rate, clinical pregnancy rate, newborns' weight, and Apgar score. Statistical analysis was carried out with ANOVA test ($p < 0.05$ significant).

Results: The significantly different results were: in couples with and without MF, the mean total oocytes (9.62 vs. 8.55, $p = 0.000$), mature oocytes (7.05 vs. 6.54, $p = 0.012$), fertilization rate (0.731 vs. 0.794, $p = 0.000$), and tendency to significance on newborns' weight (3054g vs. 2938g, $p = 0.051$). In patients with and without TF, the pregnancy rate (0.45 vs. 0.37, $p = 0.012$). In patients with and without OF, the mean total oocyte (7.54 vs. 9.24, $p = 0.000$), mature oocytes (5.77 vs. 6.93, $p = 0.000$), and pregnancy rate (0.33 vs. 0.40, $p = 0.010$). In patients with and without END, the mean total oocyte (8.35 vs. 9.09, $p = 0.025$) and tendency to significance for newborns' weight (2858g vs. 3002g, $p = 0.058$).

Conclusions: The laboratory results in masculine factor did not impact the pregnancy rate. The patients with tubal factor had a higher pregnancy rate; meanwhile, the ovarian factor negatively affected the pregnancy results, probably due to the lower number of oocytes. The lower oocyte number in endometriosis did not translate into clinical results. The tendency of higher newborns' weight in masculine factor and lower in endometriosis should be studied further.

COI

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LOWER LEVELS OF DIBUTYL PHTHALATE (DBP) AND DIETHYL PHTHALATE (DEP) METABOLITES DETECTED IN THE SERUM AND FOLLICULAR FLUID (FF) OF INDIAN WOMEN UNDERGOING IVF IMMEDIATELY POST THE COVID-19 LOCKDOWN PERIOD

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Abstract

Objectives: To evaluate if the effects of the strict and lengthy lockdown in India which promoted the new norms of stay-at-home and work-from-home, closure of beauty parlours and restriction of social gatherings may have contributed to a decrease in the exposure to phthalates like DBP and DEP which are found in many cosmetics, fragrances and personal care products.

Materials and Methods: A comparative study of the levels of Mono-n-butyl Phthalate (MBP) and Mono-ethyl Phthalate (MEP) metabolites of DBP and DEP detected in the serum and FF of n = 96 women (Group A) who had their serum and FF collected and screened in 2019 and till March 2020 prior to the lockdown and n = 80 women (Group B) who had their serum and FF collected and screened post the lockdown between October 2020-June 2021. Women in both groups were age matched (median age 34 years, range 23 - 42 years). The frozen samples collected at oocyte retrieval were processed using enzymatic deconjugation followed by the solid-phase extraction technique and analyzed by liquid chromatography tandem-mass spectrometry (LC-MS/MS) to detect the levels of MBP and MEP.

Results: The median levels of MBP and MEP in serum and FF were significantly higher in women in Group A versus Group B. It was observed that the sale of beauty products during this period showed a significant drop in India.

Total Metabolite Levels	Group A (n=96) Median (IQR) ng/ml	Group B (n=80) Median (IQR) ng/ml	P Value Mann-Whitney test
MBP(Serum)	7.71 (6.21,10.96)	4.90 (3.78, 6.62)	<0.001*
MBP(FF)	1.64 (1.26, 2.11)	0.93 (0.70, 1.16)	<0.001*
MEP(Serum)	13.54 (9.37,18.76)	8.08 (5.84, 10.63)	<0.001*
MEP(FF)	5.25 (3.58, 6.12)	3.24 (2.46, 4.41)	<0.001*

IQR, interquartile range. *Significant p-value at 5% level of significance

Conclusions: The significant drop in the levels of MBP and MEP in women undergoing IVF after the lockdown reflects a decrease or absence of usage patterns of cosmetics suggesting that women may have deprioritized their use during the COVID-19 pandemic indicating that lifestyle changes reduce exposure to phthalates.

Supported by: A grant from Jaslok Hospital and Research Centre and the Sir Dorabji Tata Trust, Mumbai, India.

COI

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PREGNANCY OUTCOMES, MISCARRIAGE AND LIVE BIRTH RATES FOLLOWING THE TRANSFER OF THAWED VITRIFIED EMBRYOS DERIVED FROM IVF VS ICSI, A RETROSPECTIVE ANALYSIS.

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Abstract

Purpose: The aim of our study was to compare treatment outcomes (clinical pregnancy, miscarriage, ectopic pregnancy, and live birth rates) after transfer of IVF versus ICSI vitrified-thawed embryos.

Methods: Cohort retrospective study in the IVF unit at a university affiliated Medical Center which included 845 frozen thawed embryo transfer cycles of vitrified embryos from treatment cycles between the years 2013-2019.

Results: The median number of vitrified-thawed embryos transferred per cycle in both IVF, ICSI and IVF+ ICSI groups was 2. The average age of the patients was 32 years in both groups. In the IVF group the most common infertility etiology was unexplained infertility and in the ICSI group was male factor. No difference was observed in survival rate in IVF, ICSI and sibling oocytes group ($P=0.541$). Out of 845 FET cycles of vitrified thawed embryos, 223 clinical pregnancies were achieved (26.4%). Of these 64 (28.4%) following IVF, 131 (25.6%) after ICSI and 28 (25.9%) in the sibling oocytes group ($P=0.631$). Live birth rate did not differ between the three groups: 23.6%, 22.3% and 21.5% for groups IVF, ICSI and IVF+ICSI, respectively ($p=0.899$). Sub analysis by age below 35 and above 35 years old revealed no statistical difference between IVF and ICSI cycles in terms of clinical pregnancy, miscarriage, ectopic pregnancy and live birth rates between the groups.

Conclusions: The present study suggests that the technique of insemination has no adverse effect related to vitrification.

COI

Avi Zolotarevsky, Ido Feferkorn, Nadav Cohen, Chen Nahshon, Idit Blais, Shirly Lahav-Baratz, Mara Koifman, Martha Dirnfeld

THE IMPORTANCE OF BEING MATURE – OPTIMIZING THE TIME OF ICSI HELPS TO UTILIZE LATE-MATURING OOCYTES IN CLINICAL PRACTICE.

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Abstract

Introduction: Egg maturity is a fundamental prerequisite to its successful fertilization. In clinical practice, it is customary to assume that all oocytes exhibiting a polar body (PB) are ready for intracytoplasmic sperm injection (ICSI). However, the asynchrony between PB extrusion and metaphase (MII) spindle formation creates the risk that some late-maturing oocytes are sperm injected too early, and their developmental potential is diminished. Polarized light microscopy (PLM) enables non-invasive imaging of the MII spindle, thus confirming the egg's maturity. Preventing untimely ICSI is particularly important in poor prognosis cycles with a low number of oocytes available for fertility treatment.

Methods: Since May 2016, we performed egg maturity assessment in 526 cycles (average female age 37.4 years) with less than 6 PB-positive oocytes collected.

Results: PLM examination of 1892 oocytes (46,99% extruded PB in vitro) showed that 34,97 % of them lacked MII spindle signal at the time of scheduled ICSI (4-5 hours after retrieval). Interestingly, 38,15% of initially spindle-negative oocytes showed PLM-detectable signal 2-4 hours later, implying that they required extra time to reach the MII stage. These late-maturing oocytes had a lower, but acceptable, utilization rate than in vivo matured eggs (37.10 vs. 45.25%). Notably, 33 out of 118 live births reported so far originated from oocytes that extruded PB in vitro and normally would be discarded. In summary, PLM enables to discriminate between fertilization-competent eggs and developmentally-delayed oocytes which have not yet completed their maturation. Postponing ICSI of late-maturing oocytes allows for MII spindle appearance associated with better clinical outcomes. Our results demonstrate that spindle imaging interpreted in the context of oocyte's maturational timeline serves as a valuable tool to adjust the timing of ICSI accurately and can make a difference for poor prognosis IVF patients.

COI

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THE INCREASE IN BODY MASS INDEX DECREASES SPERM MOTILITY

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Abstract

Introduction: Obesity is an increasingly prevalent health condition worldwide and can affect male fertility. It is known that obesity can cause testicular inflammation, higher testicular temperature, hypogonadism, sperm DNA fragmentation, and erectile dysfunction. However, there are still conflicting data regarding the correlation between body mass index (BMI) and semen parameters. The aim of this study is to evaluate the impact of BMI on semen analysis results in patients treated at an infertility practice.

Materials and Methods: Observational, cross-sectional, retrospective study using data from patients seen at a private infertility clinic between 2010 and 2020. Patients were divided according to BMI (kg/m²): healthy weight (BMI 18.5-24.9); overweight (BMI 25-29.9); obese (BMI 30-34.9); and extremely obese (BMI ≥ 35), and their seminal profiles were compared, according to 2010's World Health Organization's parameters. Cancer, cryptorchidism, viral orchitis, altered karyotype, Y chromosome microdeletions, vasectomy reversion, and testosterone use were excluding factors. The results were adjusted for age, alcohol, tobacco, and drug use, medication intake, physical activity, comorbidities, and scrotum heat factors. Statistical analysis was performed using Student t-test, bivariate analysis, and linear multiple regression analysis, considering significant p<0.05.

Results: From a total of 1384 patients, 219 were excluded; therefore, 1147 patients' seminal analyses were evaluated. The BMI varied between 18.9 and 50.8: 297 had a healthy weight, 611 were overweight, 179 were obese, and 60 were extremely obese. The comparison of the groups' seminal parameters shows a significant decrease in progressive and total motility in patients with BMI ≥ 35 (p = 0.007 and p = 0.012, respectively). The complementary analysis determined BMI 29 kg/m² as the cutoff for negative impact on progressive motility (p = 0.044) and 31 kg/m² on total motility (p = 0.036). The results were still significant after age, use of cannabis, and hypertension adjustments – the other possible interfering factors were not significant.

Conclusions: In this study, sperm quality is negatively affected by BMI, with impairment since 29 kg/m² for progressive and 31 kg/m² for total motility. Our data support the potential deleterious role of obesity on semen parameters, reinforcing the importance of weight control in infertility prevention.

COI

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THE INFLUENCE OF A LARGE REFRACTILE BODY IN OOCYTES ON THE EFFICIENCY OF IVF CYCLES WITH PGT-A

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Abstract

Introduction: Refractile body (RB) is one of the main morphological abnormalities that can be observed in the cytoplasm of women oocytes. It is an inclusion that consists of oxidized lipids mixture. Data on the effect of these inclusions on fertilization and embryo development in IVF cycles are quite contradictory.

Purpose: To investigate whether the presence of large refractile bodies in the cytoplasm affects oocyte fertilization, blastocyst euploidy and IVF outcome.

Methods: The study involved 134 patients of (36.4±3.4) years old who underwent controlled ovarian stimulation using gonadotropin-releasing hormone antagonists and recombinant FSH. A total of 536 oocytes with RB and 1,430 without RB were collected, of them 72 blastocysts with RB and 327 blastocysts without RB were biopsied and vitrified. As a result, 59 euploid blastocysts with a RB and 209 blastocysts without RB were used for embryotransfer in cryocycles.

All M2 oocytes from the two groups were fertilized by intracytoplasmic sperm injection. The diameter of RB was measured using the OCTAX EyeWare program. After the injection, each oocyte was placed in a drop of one-step medium and was cultured for 5-6 days at 37°C, 6% CO₂ and 5% O₂. Oocyte fertilization, the embryo morphology was assessed on the 3rd, 5th and 6th day of the development. Blastocyst trophoctoderm biopsy and vitrification were performed on the 5-6th day of cultivation. Euploid blastocysts were transferred in cryocycles (one per a transfer).

Results: The significantly lower percentage of fertilization was found in oocytes with large RB (5,00±0.23) µm compared to oocytes in which there were no RB (65% vs 83%, P<0.05). There was the decrease in the embryo quality on the 3rd day of the development (54% vs 61%) and the blastocyst formation rate (43% vs 54%), (P<0.05). The significant difference was also observed in the clinical pregnancy rate (27% vs 41%, P<0.05). However, there was no significant difference in the percentage of euploid blastocysts from the total number of blastocysts between the groups (48% vs 51%).

Conclusions: The presence of a large refractile body in oocytes negatively affects the IVF outcome, causing the decrease of fertilization, blastulation and clinical pregnancy rates.

COI

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THE MAIN FACTORS OF IVF FAILS

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¹Azerbaijan

Abstract

Introduction: The purpose of the carried out research was to determine main reasons of IVF-fails and to increase the implantation rate at the next attempt of treatment.

Methods: Based on this goal was conducted a retrospective analysis of 81 medical records of couples with IVF fails (control group). A prospective study included 66 patients with repeated attempt of IVF cycle (main group). Depend on the IVF fail factors (uterine or embryological) the main and control groups were divided into two undergroups. So there were determined 56 patients in control group and 40 patients in main group with uterine factor, and 25 IVF cycles in control group and 26 IVF cycles in main group with embryological factor of IVF fails.

Results: As a result of research work, it have shown the dependence of the outcomes after in vitro fertilization from uterine (69,1%) and embryolo-gical (30,9%) factors. It is necessary to control uterine cavity by hysteroscopy with pathomorphology of endometrium after the first IVF fails and before the next attempt of IVF cycle. The incidence of pathologic findings on hysteroscopy is high in patients with IVF fails and according to outcomes of work it is consist of 65% of cases. The rate of chronic endometritis was determined at 25% patients, endometrial hyperplasia - at 30% patients and endometrial polip – at 10% patients.

In patients with uterine factor of IVF fails at the next attempt with using the operative preparation the implantation rate was 47,5%. In patients with embryological factor of IVF fails at the next attempt with applying the changes of IVF program or ovarian stimulation protocols the implantation rate was 65,4%. The total implantation rate after the usage of the prepared algorithm of conducting of patients with IVF fails at the next attempt was 54,5%.

COI

Aynura Ismayilova, Jamila Qurbanova, Afat Hasanova

THE PREVALENCE OF INFERTILITY IN LITHUANIA – BASED ON THE ANALYSIS OF DIAGNOSTIC DATA

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Abstract

Introduction: To evaluate the epidemiological infertility reasons in Lithuania and to compare it with international epidemiological data. Epidemiological research on infertility reasons has not been conducted in Lithuania.

Materials and Methods: The retrospective studies were performed in „Infertility clinic” and were based on diagnostic data analysis from medical documentation of 718 couples on last five-year period. The study included couples who have been identified infertility diagnosis according WHO definition. The study assessed these indicators: age, duration of infertility, pregnancies and their outcomes (in cases of secondary infertility), complete health history, hormonal assessment, tubal factors, semen analysis and treatment.

Results: During the study of 718 couples applied to Infertility clinic, causes related to: 1. Ovulation disorders have been identified in 210 cases (29.23%) as the main cause of infertility in 191 cases (26.60%). (Polycystic ovary syndrome - in 124 cases (65.26%), ovulation disorder - in 24 cases (12.63%), ovarian failure - in 42 cases (22.11%)). 2. Tubal damage - in 96 cases (13.37%) as the main cause of infertility in 75 cases (10.46%). 3. Uterine or peritoneal disorders - in 161 cases (22.42%) as the main cause of infertility in 134 cases (18.66%). (Endometriosis - in 135 cases (18.80%), uterine myoma - in 19 cases (2.6%), uterine congenital anomaly - in 7 cases (0.97%)). 4. Factors in the male causing infertility - 234 cases (32.59%) as the main cause of infertility in 138 cases (19.22%). (Asthenozoospermia - 100 males (42.73%), oligozoospermia - 50 males (21.37%), oligoasthenozoospermia - 72 males (30.77%), azoospermia - 12 males (5.13%)). 5. Infertility is unexplained - in 180 cases (25.06%).

Conclusions: The prevalence of etiology pattern of infertility in our study is similar with The World Health Organization (WHO) multinational epidemiological study. However, frequency of idiopathic semen abnormalities (89.86%) is much higher than other studies (34%) that require further consideration. Identifying the cause infertility of unknown etiology, assessing possible influencing factors (immunological, genetic, endocrinological), determining the cause of infertility, applying new diagnostic tests will have practical application in solving the growing problem of infertility.

COI

Egle Jasinskiene N/A

THE USE OF 'BLACK BONE' SEQUENCING IN THE ASSESSMENT OF THE FOETAL SKELETAL SYSTEM. IS IT BLACK AND WHITE? A PILOT STUDY

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Abstract

Aims: To establish normative femur length (FL) data for multiple magnetic resonance imaging (MRI) sequences.

To assess if the novel 'black bone' sequence is better quality and more accurate for FL measurements than current sequences in use.

To assess if the novel 'black bone' sequence is good quality, reliable and useful to clinical practitioners.

Methods: 75 participants from the Jessop's Wing in Sheffield, plus referrals from out of area, were scanned using currently available MRI sequences, plus a novel 'black bone' sequence, developed locally. All Images were acquired using Siemens 1.5T Avanto MRI scanners (Erlangen, Germany). Measurements were calculated using Horos DICOM viewer. Participants were split into normative and pathological based on the referral to foetal medicine.

Data collected included the FL and the quality of the images from four independent observers, as well as the utility of the 'black bone' sequence to a foetal medicine specialist, considering parental counselling and pre-natal diagnosis.

Results: Current normative ultrasound (US) femur length (FL) measurements were directly comparable to previously established normative measurements.

'Black Bone' and B0 sequences accurately determine the FL when comparing to known US FL.

'Black Bone' sequence images were better quality than other MRI sequences available, based on independent observer gradings.

A role for 'Black Bone' imaging in antenatal care and counselling was deemed to present in 91.89% of cases assessed.

Inter-observer testing showed high reproducibility levels within the 'Black Bone' images.

Conclusions: 'Black bone' imaging is a reliable, useful and novel foetal MRI sequence, which can add valuable, accurate information during antenatal care of pregnancies with skeletal abnormalities.

COI

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UNDERSTANDING THE CONTRIBUTION OF PATERNAL FACTORS ON THE ENDOPLASMIC RETICULUM STRESS IN PRE-IMPLANTATION EMBRYOS

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Abstract

Introduction: Gametes and preimplantation embryos are subjected to various types of stress when cultured in vitro. The ability of these embryos to maintain cellular homeostasis throughout development is essential for ensuring their normal development. One of the important stress coping responses includes the UPR (unfolded protein response), which helps to mitigate endoplasmic reticulum (ER) stress. ER stress can be intrinsic, as well as, inducible in preimplantation embryos, and the major ER stress response components can be found in embryos during preimplantation development. Parthenogenetic embryos, that have no contribution from the spermatozoa, exhibit delayed development, early embryonic arrest, high degree of fragmentation and poor blastocyst quality in comparison to the normally fertilized embryos (NFE). These differences are said to be associated with the compromised genome of the parthenotes due to their uni-parental gene expression. In the present study, we assessed whether the absence of paternal genome alters the endoplasmic reticulum stress levels and ER stress response in the pre-implantation embryos.

Materials and Methods: For the study, adult female Swiss albino mice were primed with PMSG and hCG. The OCCs collected were used to generate parthenotes and Normally Fertilized embryos (NFEs). Haploid and diploid parthenogenetic embryos were obtained by strontium-induced activation in presence/absence of Cytochalasin D, while the NFEs derived from IVF. IVF embryos were treated with different concentrations of sorbitol to induce ER stress, with or without an ER stress inhibitor salubrinal at the 2-cell stage. The optimal concentration of salubrinal (100nM) was then used for treatment of parthenogenetic embryos at 2-cell stage, to study effect of ER stress on embryo development.

Results: The haploid parthenogenetic embryos show higher levels of endogenous ER stress when compared to the NFEs. Further, the NFEs exhibited lower developmental potential and poor blastocyst quality when subjected to exogenous (sorbitol-induced, 25 mM) endoplasmic reticulum stress. Blastocyst rate improved when the sorbitol treated embryos were cultured in media containing salubrinal (100nM), which is an ER stress inhibitor. However, salubrinal had no effect on the embryo development, blastocyst rate and quality in haploid and diploid parthenotes.

Conclusions: Our results indicate that the parthenogenic embryos have aberrant ER stress pathway.

COI

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VARICOCELECTOMY IMPROVES THE SPERM CAPACITY TO INDUCE OPTIMAL EMBRYONIC DEVELOPMENT POST-FERTILIZATION

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Abstract

Objectives: Left varicocele has a detrimental effect (European Urology Supplements 13:89-99,2014) on the sperm ability to induce optimal early embryonic development post-fertilization. Our objective was to evaluate the effects of varicocelectomy on early embryonic development of oocytes recovered from female donors.

Participants and Methods: ICSI procedures using female donor oocytes were performed with spermatozoa from 13 men (group A) with left varicoceles. The female partners of the latter men could not produce oocytes of appropriate quality for participating in assisted reproductive technology (ART) programs. Injected oocytes were cultured for 96 hours. The fertilization rate (FR) (100X fertilized oocytes/ injected oocytes) and the blastocyst development rate (BDR) (100Xdeveloped blastocysts/fertilized oocytes) were recorded. Developed blastocysts were transferred to surrogate females. Another group of nine men with left varicoceles(group B) whose wives could not produce oocytes of appropriate quality for ART programs underwent microsurgical left varicocelectomy. Six to 12 months later ICSI cycles were performed using female donor oocytes. FR and BDR were recorded, as well. Developed blastocysts were transferred to surrogate females.

Results: BDR was significantly larger ($P<0.05$) in group B than in group A (Chi-Square test – Yates correction).

Conclusions: Left varicocelectomy improves the ability of the male gamete to trigger the cascade of ooplasmic events that lead to early embryonic development up to the blastocyst development. In the current study the injected oocytes had been recovered from normal young females thus any female infertility factor is excluded. It appears that left varicocelectomy improves the DNA integrity, the male gamete nucleus protein matrix quality and/or the centrosomic integrity/function allowing more optimal embryonic development. The current study indicates an important role of the male gamete beyond fertilization.

COI

Ioannis Giakoumakis, Nikolaos Sofikitis

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