ARCS | Symposium 2025

Conference Brochure

Friday 19th September 2025

Contents

About the 2025 ARCS Symposium

It is our pleasure to welcome you to the fourth ARCS Symposium, held here in person at the Edgbaston Park Hotel, University of Birmingham on Friday 19th September. We hope that hosting the symposium here in Birmingham, a city and University with a rich legacy in the field of reproduction, will bring people together as part of our global community.

The organising committee has warmly invited poster abstract submissions from attendees who wish to share their work. Most of the talks have been selected from abstracts, allowing a range of emerging research which will be presented by junior and senior researchers.

A local judging panel has also selected a number of these who have been invited for oral presentations during the conference, allowing for a range of emerging research to be presented by junior and senior researchers, along with several invited key speakers from across the industry. Specific talk time slots can be found listed on the symposium programme page.

We look forward to welcoming you all to Birmingham and we hope you find the symposium insightful.

Meurig Gallagher - ARCS 2025 Chair

Key Information

Registration & Information Desk – Welcome Refreshments on Arrival

Date	Time	Location
Friday 19th September	**08:30 – 17:00**	Lloyd Suite Lounge (in Hornton Grange)

Refreshment Breaks, Lunch & Exhibitor Breakout sessions

Our sponsors will have an exhibition stand in the Lloyd Suite Lounge. They have chosen to sponsor this event because they believe their products and services may be of interest to you. We kindly encourage you to visit each exhibition stand during the dedicated breaks.

Break	Time	Location
Refreshment Break	**11:10 – 11:30**	Lloyd Suite Lounge
Lunch	**12:30 – 13:45**	Hornton Grange Conservatory
Refreshment Break & Exhibitor Sessions	**14:45 – 15:30**	Lloyd Suite Lounge

Social Events

Social Event	Time	Location
Drinks Reception	**17:00 - 18:00**	Lloyd Suite Lounge and Bar Area
Conference Dinner	**19:00**	Lloyd Suite

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Nexpring Health unites industry leaders into one powerful global force, dedicated to advancing infertility care and redefining the future of ART by putting you - the embryologists, clinicians, and fertility clinics at the center of everything they do. Their solutions transform your daily reality by simplifying the complex, while their unwavering, hands-on support empowers you to achieve consistent, high-quality outcomes.

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Vitrolife Group is a global leader in reproductive health, dedicated to helping people fulfil the dream of parenthood. With innovative solutions spanning fertility treatments, genetic testing, and medical device technologies, we support clinics and laboratories worldwide in achieving higher success rates. Our portfolio includes products and services for IVF, embryo culture, time-lapse monitoring, cryopreservation, and advanced genetic analysis. By combining science, technology, and passion, Vitrolife Group partners with healthcare professionals to improve patient outcomes and shape the future of assisted reproduction. Operating in more than 110 countries, we are committed to advancing fertility care with quality and trust.

Invited Speakers

Laura Bridgens

Laura Bridgens was conceived via anonymous donor sperm in the 1980s and is the founder of Donor Conceived UK a new peer-led charitable organisation dedicated to centring the rights of and enabling the best possible outcomes for donor conceived people. Laura is also a member of PROGAR a UK multi-agency, multi-disciplinary group whose focus is on the lifespan impact of donor conception and surrogacy, and is the chair of the Donor Conceived Register Registrants Panel.

Jason Kasraie

Jason is Consultant Embryologist, head of fertility services and Human Fertilisation and Embryology Authority 'Person Responsible' at the Shropshire & Mid-Wales fertility centre. He is a visiting Professor at the University of Chester. He holds Fellowships at Royal College of Pathologists and the Academy for Healthcare Science. He is a former chair of the Association of Clinical Embryologists and was the founding Chair of the Association of Reproductive and Clinical Scientists. He has worked as a member of the board of the HFEA, a Director of the Association of Clinical Scientists, and a member of the professional council of the AHCS. He sits on the Genomics and Reproductive Science specialty advisory committee, and the Healthcare science committee at the Royal College of Pathologists (RCPath).

George Lainas

Dr. George Lainas is a reproductive gynaecologist and the Scientific Director of Eugonia IVF Unit in Athens, Greece. He is a former Coordinator of the Special Interest Group (SIG) on Reproductive Endocrinology at the European Society of Human Reproduction and Embryology (ESHRE). Currently, he serves as an Associate Editor of Human Reproduction Update.

Dr. Lainas has played a pivotal role in the development of ESHRE guidelines: Recurrent Implantation Failure, Ovarian Stimulation in ART, Key Performance Indicators (KPIs) in IVF and Preconceptional care. He has authored numerous original research papers published in peer-reviewed scientific journals and is a sought-after speaker at international conferences, having delivered over 100 invited lectures.

Hannah Newby

Hannah Newby is employed as a Regional Lab Director at Care Fertility, where she uses her expertise in multi-site management to oversee the Care clinics in the North of England; Manchester, Cheshire, Liverpool, Sheffield and Leeds.

Hannah is one of only a select few scientists in the UK qualified to Consultant Clinical Scientist level, demonstrating her deep understanding of reproductive science.

Passionate about nurturing future talent, Hannah plays a vital role in teaching on the STP training scheme. She is involved in writing the curriculum and currently serves as the lead content writer for the final year assessment exams.

Hannah has maintained a prominent and active role within the professional body; the Association of Clinical and Reproductive Scientists (ARCS), throughout her career. Formerly Chair of the Practice and Policies Committee and currently ARCS Secretary and Deputy Chair.

Joris Veltman

Professor Joris Veltman is a Dutch human geneticist, Chair of Reproductive Genomics and Director of the Institute of Genetics and Cancer at the University of Edinburgh. Prior to this, he was Director of the Institute of Genetic Medicine and Dean of the Biosciences Institute at Newcastle University, and before that he worked at the Department of Human Genetics, Radboud University, The Netherlands.

Joris has contributed significantly to unravelling the genetic causes of rare disease, to our understanding of mutational mechanisms underlying genetic disorders and to the implementation of genomics approaches in medicine. His research using both exome and genome sequencing provided strong experimental evidence for a de novo paradigm in severe early-onset disorders.

In Edinburgh, Joris is starting up a multidisciplinary research group with expertise in genome technology and bioinformatics, applied to reproductive disorders. The group is particularly focused on studying the role of de novo mutations and structural variation in severe forms of male infertility, using short and long-read sequencing in patient-parent trios. It aims to identify genes, non-coding regions and biological mechanisms involved in male infertility and consecutively develop genetic tests for implementation in routine diagnostics. These male infertility studies are done in close collaboration with fertility experts from the University of Edinburgh and NHS Lothian, UK fertility clinics and international collaborators. Joris has co-founded the International Male Infertility Genomics Consortium (IMIGC.org) and is actively involved in promoting research and diagnostics of reproductive disorders. In addition, his group supports the application of genomics approaches in rare disease more broadly, including the study of complex genomics regions, as well as the clinical implementation of genomics tests.

In 2016, Prof. Veltman and Brunner were awarded the King Faisal International Prize for Medicine for pioneering the clinical application of next generation genetics. In 2021 he was elected Fellow of the Academy of Medical Sciences, United Kingdom.

Suzannah Williams

Prof Williams leads a multi-disciplinary group investigating ovarian function in health and disease at the University of Oxford, established in 2008, after gaining valuable experience working in Ireland, Australia and New York. The overarching aim is to generate new fertility preservation techniques by developing innovative new technologies for women and endangered species. She leads the Ovarian Research Programme for the Oxford Fertility Preservation Service. She founded the Rhino Fertility Project at Oxford in 2019 and the Poo Zoo in 2024. She is the Society for Reproduction and Fertility's New Investigator of the Year 2010. Prof Williams enjoys supervising and mentoring; she has supervised over 90 graduate students. She also has a keen interest in scientific communication with her *Conversation* articles having over half a million reads.

Lucy Wood

Lucy is a final-year HSST trainee in Reproductive Science based at Jessop Fertility in Sheffield. She has a strong interest in education and training, having led the curriculum review for the STP in Embryology. Lucy previously served as Secretary for ARCS and continues to contribute to the field through the ARCS Education Committee.

Friday 19th September 2025

09:00 - 10:00	**Open registration, welcome refreshments, and exhibition**
Morning Session - Dame Hilda Lloyd Suite, Edgbaston Park Hotel **Chair: Meurig Gallagher**	
10:00 - 10:10	**Welcome and Introduction**
10:10 - 10:50	**Embryo Transfer: An Evidence-Based or Just an Empirical Procedure?** George Lainas, Eugonia Assisted Reproduction Unit, Athens
10:50 - 11:10	**Procuring azoospermic semen samples for South Yorkshire Police (SYP) sniffer dog training** Helen Clarke, Jessop Fertility
11:10 - 11:30	**Refreshments**
11:30 - 12:10	**Donor Conceived UK** Laura Bridgens, Donor Conceived UK
12:10 - 12:30	**A high phytochemical diet positively impacts markers of fertility in adult males** Joanne Wilson, Fertility Exeter (RDUH NHS Foundation Trust)
12:30 - 13:45	**Lunch, Poster session, and Exhibitor breakout sessions**
Afternoon Session Chairs: Amy Barrie	

13:45 - 14:25	**Male Infertility: Why cause matters and genetics can't be ignored** Joris Veltman, The University of Edinburgh
14:25 - 14:45	**Rethinking Male-Factor Infertility: Consecutive Ejaculate Strategies in IUI for Women Over 35** Gulam Bahadur, Royal Free Hospitals NHS Trust
14:45 - 15:30	**Refreshments and Exhibitor Breakout Sessions**
15:30 -16:10	**Ovarycentric Fertility Preservation: from humans to rhinos** Suzannah Williams, University of Oxford
16:10 - 16:20	**ARCS Policy and Practice Update** Jemma Walker, ARCS P&P Chair
16:20 - 17:00	**Panel discussion: Future Planning for the healthcare Science Workforce** Chair: Jason Kasraie Panel: Rachel Gregoire, Hannah Newby & Lucy Wood
17:00	**Andy Glew People's Prize & Close**
17:00 - 18:00	**Networking with refreshments**
19:00	**Conference Dinner, Lloyd Suite, Edgbaston Park Hotel**

O1

Procuring azoospermic semen samples for South Yorkshire Police (SYP) sniffer dog training

Dr Helen Clarke[1], Sergeant Daniel Lumley[2],
Andrology Team[1] [1]Jessop Fertility, Sheffield, UK, [2]South Yorkshire Police, Sheffield, UK

Aim: To establish “an agreed, ethical route for procuring seminal fluid” for training and maintaining SYP’s Victim Recovery (VR) / Forensic Evidence Detection (FED) police search dogs.

Background: SYP have 3 licensed VR/FED search teams, who deploy throughout the UK, in support of homicides, missing people searches, and serious sexual offences. The police dog teams are trained to search for and identify decomposing human tissue, and it was vital that they maintain this scent pairing. Until recently, police officers across the UK were (unofficially) providing semen samples for this training, but in early 2024 had been instructed to create a formal pathway for procurement, storage, training use, documentation, and disposal. SYP then contacted staff at Jessop Fertility to explore the possibility of a collaboration.

Design: Ensuring regulatory body and legal compliance involved seeking advice from the Human Fertilisation and Embryology Authority (HFEA) and STH Trust’s Human Tissue Act (HTA) Designated Individual, Quality Director and legal team. This was not straightforward. The HT Authority has remit over cellular human material except for gametes. The HFEA suggested that the 2009 Special Exemption Regulations would apply and would allow storage of sperm (by SYP) without a licence from the HFEA, under certain conditions. Legislation allows using gametes for training, but it is dogs that are being trained, not people.
The project was also discussed twice by Jessop Fertility’s Ethics Committee before being approved, with certain conditions, including informed consent for participants, although this would not have been a legal requirement.
A protocol was developed (including patient information and consent forms) to obtain consent from individuals attending for post-vasectomy semen analysis to donate their semen to SYP. Only azoospermic samples would be included, as it was thought that the absence of sperm may aid with recruitment rates. A memorandum of understanding between the parties was put in place.

Protocol: The patient contacts the Andrology Department to make their post-vasectomy semen analysis appointment, at which point they are asked if they are willing to receive information about the project. If they agree, the information leaflet is emailed to them. When they attend for their analysis, they are asked if they would like to participate. If they agree, they complete a consent form.
Once analysis is complete, azoospermic samples from consented individuals are anonymised and stored at -20°C until collected by SYP in batches. A chain of

custody is maintained, and, at the point of collection, the semen samples become the remit of SYP's HTA licence.

Results: Since recruitment started in April 2025, 17/20 patients who were asked to have agreed to have the information leaflet sent to them. 15/17 consented to take part, and 11/15 were azoospermic and so their samples were suitable for use in the project. Feedback from patients has generally been positive.

Outcome: Although time-consuming and complicated to set up, this has been a worthwhile project. There was a risk that UK police sniffer dogs may lose the training to detect semen to aid investigations into suspected sexual crimes. Creating a pathway for procurement of this invaluable training resource may prove useful in inspiring collaborations between other UK police forces and Andrology departments throughout the UK.

O2

A high phytochemical diet positively impacts markers of fertility in adult males

Mrs Joanne Wilson[1], Dr Luciana Torquati[2], Dr Michael Carroll[3]
[1]Fertility Exeter (Royal Devon University Healthcare NHS Foundation Trust), Exeter, United Kingdom, [2]University of Exeter, Exeter, United Kingdom, [3]Manchester Metropolitan University, Manchester, United Kingdom

Background: Fertility rates are declining in high income countries including the UK, with a current prevalence of 1 in 6 couples requiring fertility treatment. Approximately 30% of cases have a male factor diagnosis which can be genetic, metabolic or idiopathic, but emerging evidence implicates increased oxidative stress as a culprit. Phytochemicals could play an important role in reducing oxidative stress, however there is limited evidence on the effect of high-phytochemical diets on improving fertility outcomes in men.

Methods: Males aged 18 to 50 were recruited for this within-participant, controlled study. Participants were asked to follow a plant-based diet for 12 weeks and received weekly compliance checks. Sperm concentration, motility and morphology were measured in accordance with WHO guidelines. Oxidation reduction potential (ORP) was measured using MiOXSYS analyser and sperm chromatin integrity was assessed using aniline blue staining (WHO protocol). All tests were conducted at baseline and 12 weeks.

Results: From this ongoing trial, we present pre-post preliminary data from n=13 intervention males aged 27-46 (mean 38.4). A significant improvement ($p<0.01$) was seen in relative sperm motility for all classes measured; total motility (60.8% vs 57.5%), total progressive motility (60.8% vs 48.4%) and rapid progressive motility (49.4% vs 34.8%). A significant improvement ($p=<0.05$) was also found in the percentage of sperm with optimal chromatin condensation (93.5% & vs 87.5%). Although not significant, we observed positive trends in sperm concentration, optimal morphology and ORP

Conclusion: We found that following a high-phytochemical diet for 12 weeks resulted in improvements in sperm number and morphology and significantly improved sperm motility. Additional improvements in chromatin integrity and ORP suggest improved DNA packaging and potential improvements in fertilisation rates and healthy embryo development. Our findings warrant further investigation and corroboration with changes in the control group to confirm causality and effect sizes in our outcomes.

O3

Rethinking Male-Factor Infertility: Consecutive Ejaculate Strategies in IUI for Women Over 35

Dr Gulam Bahadur[1], D, Professor Roy Homburg[2], Professor Ralf Henkel[3], Dr Bryan Woodward[4], Professor Asif Muneer[5], Professor Santanu Acharya[6], Dr Abha Govind[1], Ms Afeeza illahibuccus[1], Professor Eric Jauniaux[7], Ms Ansam Al-Habib[1]

Text - Abstract Title - Rethinking Male-Factor Infertility: Consecutive Ejaculate Strategies in IUI for Women Over 35

Study question - Can consecutive ejaculate (CE) strategies significantly enhance IUI live birth (LB) success rates in women older than 35 years with unexplained or male factor infertility?
What is already known? - ESHRE policy recommends IUI before IVF for unexplained infertility, while IVF is fast-tracked for male factor infertility. Limited data exist on IUI outcomes for male-factor infertility, though pregnancies using <5×106 sperm are reported. Our earlier pilot study on innovative CE use in IUI offered a valuable alternative to fast-tracking male-factor patients to IVF. This approach provides a less invasive, cost-effective option, potentially reducing IVF reliance. It highlights a cost-saving strategy for public services and funding bodies while improving treatment access.
CE IUI improves global subfertility care, challenging traditional management and treatment policy assumptions for male-factor infertility.

Study design and methodology - This retrospective cohort study (2010-2019) analysed 596 IUI cycles from 263 nulliparous women: 230 with CE and 366 standard (non-CE) treatments, in 98 and 165 patients, respectively. Cases with <5×106 motile sperm were usually referred for IVF. However, CE was profiled beforehand for the possibility of performing IUI with more sperm, before transfer to IVF procedure.

Results/findings - The LBR per cycle in CE (previously fast-tracked to IVF) and control groups (unexplained infertility with >5×106 TMSC) was 11.3% and 13.1% (P=0.52), and 26.5% and 29.1% (P=0.65) per woman, respectively. The mean age was 37.7 years in the CE and 38.0 years in the control group (P=0.34). Most LB occurred when TMSC exceeded 10×10^6, with success rates of 65.4% (CE) and 87.5% (control). Over 6 cycles, the LBR increased from 10.5% to 13.8% (P=0.49) in the CE group and from 12.3% to 16.7% (P=0.34) in the control group. No significant differences were found between groups. Data suggest CE may be a viable alternative to IVF for male factor infertility, particularly in women over 35. The threshold for sperm count in IUI success may need re-evaluation, with improved outcomes observed when TMSC exceeds 10×106. Increasing follicle numbers may also benefit LBR in women over 35.

Limitations - This 9-year retrospective analysis included patients with failed IVF cycles and restricted 3-day alternate weekday IUI due to resource constraints. While consistent operators ensured uniformity, scheduling limitations may impact outcomes. Results reflect the efforts of clinical, nursing, and scientific staff, though operational constraints should be considered in broader applications.

Conclusions - This observational, non-randomised study shows that patients fast-tracked to IVF due to low sperm counts can achieve similar success rates with IUI using CEs. For women over 35, increasing follicle numbers to two or three should be considered, with thorough risk assessments. We recommend raising the TMS threshold from 5×10^6 to 10×10^6, though lower TMS levels may still be effective. Offering up to six IUI cycles is justified, with consistent success rates. Optimised IUI with CE provides a cost-effective, accessible IVF alternative, supporting healthcare sustainability and empowering patients. IUI with CE also offers a viable option for male factor infertility.

P1

Sperm mechanotransduction: What is the effect of flow rate on sperm flagella waveform?

Miss Rachel McKernan[1, 3], Professor Jackson Kirkman-Brown[1, 2], Professor Meurig Gallagher[1, 2]
[1]Centre for Human Reproductive Science - Birmingham Women's and Children's NHS trust, Birmingham, United Kingdom, [2]University of Birmingham - Department of Metabolism and Systems Science, Birmingham, United Kingdom, [3]Department of Life Science, Faculty of Science and Engineering, Manchester Metropolitan University, Manchester, United Kingdom

Background: Infertility affects up to 17.5% of couples, including those affected solely by male factor infertility. Despite its significance, there is limited research on the fundamental understanding of sperm motility, which is essential for natural conception. Sperm cells travel approximately 19cm to the fallopian tube through moving fluid, which exerts a force on the sperm. Understanding how flagellar beat patterns change under different flow rates, which induce a mechanotransducive response (conversion of mechanical forces into biochemical or electrical signals), is important for our understanding of natural conception.

P2

Evaluating the efficacy of the iDAScore as an AI decision support tool in embryo selection.

Miss Hannah Travers[1]
[1]University Of Dundee, Dundee, Scotland

Study Question:

To assess data from Ninewells Assisted Conception Unit to determine if the iDAScore, Artificial Intelligence (AI) software, can be used to optimise embryo grading/selection.

What is already known?

Currently, in the UK, embryos are assessed and selected using the Gardner Score. This involves a morphological assessment of embryos on day 5. This system is variable and disregards much of embryo development. These limitations drove Vitrolife to create an AI model to improve embryo selection. The model, entitled the iDAScore, assesses embryos by comparing time lapse images of embryo development to a database of time lapse images from embryos with known clinical outcomes. The software outputs a score based on the likelihood of clinical pregnancy. Emerging evidence suggests that the iDAScore has a strong ability to predict embryo outcomes.

Study design and methodology:

This was a single centre retrospective study conducted at Ninewells Assisted Conception Unit (ACU). It involved data collection from 354 Assisted Reproductive Technology (ART) cycles. Cycles were excluded for the following reasons:

· No embryo transfer

· Embryos not cultured on Embryoscope+ (required for iDAScore)

· Donor oocytes

· Double embryo transfer

· Missing iDAScore

· No Garder Score (in cases of early blastocysts and morulae).

Following exclusion, 196 cycles with single embryo transfers on day 5 were assessed. Human embryologists graded the embryos using the Gardner Score and were blind to the AI score. The iDAScore (AI score) was generated by the Vitrolife Software on the Embryoscope+.

Receiver Operator Characteristic analysis was performed to assess the ability of the Gardner Score and iDAScore to predict embryo outcomes. Chi square tests were done to test for a correlation between score/grades and outcomes. Chi-square analysis was done to determine if human embryo grades and the iDAScores agree on embryo scoring and selection.

Results/Findings

The investigation found that the iDAScore brings about a minimal improvement compared to human morphological grades in the ability to predict embryo outcomes. This was found through ROC analysis that showed an increased area under the curve value for the iDAScore in relation to outcomes compared to human grades. However, this is not a significant difference. Chi square tests found a strong association between iDAScores and embryo outcomes.

This indicates that the iDAScore can improve embryo selection through increased predictive power. Additional evidence suggests that further benefits to the iDAScore are reduced time taken to grade and select embryos and improved standardisation. However, careful consideration of factors beyond improvement needs to be taken. For example, AI software is prone to cyber-attacks. Additionally, patient and staff opinions need to be considered before implementing AI in clinics.

Limitations

Caution should be taken in relation to the generalisability of the results. This was a single centre study with a relatively small sample size that only included fresh transfers.

Embryos were selected based on human grades so the full predictive capability of the iDAScore is not represented.

Conclusions

Overall, the results of this study suggest that the iDAScore should be introduced in clinics to aid in embryo selection. However, the increase in predictive power is not significant for the iDAScore compared to human grades. This means that there is not enough evidence to suggest that AI should be used in place of humans. This study recommends that the iDAScore should be used as a tool to aid embryo selection. It should be used to aid in prioritisation of similar grade embryos.

P3

Investigating the mechanisms involved in human sperm-zona pellucida binding.

Miss Olivia Bryce[1]
[1]University Of Dundee, Dundee, Scotland

Study question:

Investigate mechanisms involving sperm-zona pellucida (ZP) binding by assessing the influence of oocyte maturity and evaluating the sperm-ZP binding test as a sperm function test.

What is already known:

A key step in successful fertilisation is the binding of sperm to the ZP, where the sperm can bind to and penetrate the ZP to then fuse with the oolemma. The ability for sperm to bind to the ZP is one of the best indicators of a sperms fertilising ability. Failure of sperm to bind to the ZP is highly recognised to be a common cause of fertilisation failure in assisted reproductive technologies (ART) particularly in vitro fertilisation (IVF). The sperm-ZP binding test is recommended for cases of low fertilisation rates or unexpected fertilisation failure and IVF failure.

Study design and methodology:

In this practical laboratory study, a total of 21 oocytes from patients at the Assisted Conception Unit in Ninewells Hospital, Dundee, were used. Various maturational stages of oocytes were used in this study – germinal vesicle (GV), metaphase I (MI), metaphase II (MII), and necrotic or empty ZPs. Oocytes that had been used in both IVF and intracytoplasmic sperm injection (ICSI) treatments were also included. Micromanipulation of the oocyte included slicing the ZP with an insulin needle to expel the cytoplasm and nuclear material, leaving just the ZP. The ZP was then incubated with ~150,000 sperm for 4 hours. Sperm binding was quantified and compared between treatment and maturity groups using a one-way analysis of variance (ANOVA) and post hoc analysis.

Results:

Results showed that MII oocytes exhibited the highest sperm binding, followed by MI oocytes. GV and necrotic oocytes consistently showed little to no binding. Statistically significant differences were observed between MII oocytes and both MI oocytes and necrotic and empty ZPs ($p<0.05$). No statistically significant difference was observed in sperm binding efficiency between the IVF and ICSI treated oocytes ($p>0.05$). The binding observed in MI oocytes, although lower on average than MII oocytes, indicates that partial maturation of the ZP may be sufficient to support some sperm interactions. This alludes to the idea that ZP functionality develops progressively and may exist along a continuum, rather than being fully binary between immature and mature.

Limitations:

Due to the small sample size used in this study, the results cannot be generalised. The method of slicing the ZP varies across oocytes, although the same type of insulin needle was used across all oocytes, naturally, the slice made will not be the same size due to user errors.

Conclusions:

This study demonstrates a clear relationship between oocyte maturity and sperm-ZP binding efficiency. The use of the sperm-ZP binding test can be utilised in research and clinical settings with MII oocytes producing the most repeatable results that reflect normal physiological conditions. Supporting the broader application of oocytes in ART diagnostics and sperm function assessment. Overall, the use of the sperm-ZP binding test can support diagnosis in ART and act as an invaluable tool in research settings.

P4

Gx Media Study: A sibling oocyte study to investigate the impact on fertility outcomes when using culture media supplemented with antioxidants; a preliminary analysis.

Mr Isheanesu Mutasa[1,2], Mrs Bijal Patel[1], Dr Rachel Gregoire[1]
[1]Hewitt Fertility Centre, Liverpool Women's Hospital, Liverpool, United Kingdom,
[2]Manchester Metropolitan University, Manchester, United Kingdom

Background

Physiological levels of reactive oxygen species (ROS) are critical during gametogenesis and fertilisation with excessive ROS impairing fertility through DNA fragmentation, chromosomal abnormalities, cellular apoptosis and disrupted embryogenesis. Research suggests protective effects of antioxidants alpha-lipoic acid (ALA), N-acetyl-L-cysteine (NAC), and acetyl-L-Carnitine (ALC).

Aims:
This study aims to use a sibling oocyte model to compare the effect of antioxidant supplemented culture media (AOX) against standard culture media on blastocyst utilisation rates.

Primary outcome:
- AOX effect on blastocyst utilisation rates.

Secondary outcomes:
- Impact of antioxidant media on embryo morphokinetics.
- Impact of antioxidant media on fertilisation rate and clinical pregnancy rate.
- Determine if patient age, BMI, and oxidative stress affect the efficacy of antioxidant media.

Methods:
- Collected oocytes divided between AOX and control culture media, randomising the lead follicle.
- Semen samples fractioned, prepared and resuspended in AOX or control media.
- Lead follicular fluid and semen tested for oxidative stress and antioxidant capacity.
- Insemination and culture of resultant embryos with corresponding media.
- All other processes followed local standard operating procedures.

Results:
Results showed a significant difference in time to pronuclear fading (tPNf) between the AOX media cohort and the standard culture media ($p=0.04$). There were no significant differences in fertilisation rate, blastocyst utilisation rate and clinical pregnancy between AOX media and standard culture media.

Conclusion:
While the interim analysis has not produced results of any marked clinical significance, the completion of the study will inform best practice and add to the pool of knowledge surrounding optimal embryo culture conditions.

P5

Evaluating the Clinical Potential of 1PN Embryo Transfer in Assisted Reproductive Technologies.

Miss Lauren Smith[1]
[1]Student at the University of Dundee

Study question: How does the development of 1PN compare to that of typical 2PN embryos. Can these 1PN embryos be transferred and what is their clinical outcomes?

What is already known: Fertilisation is typically identified by the presence of two pronuclei (2PN), representing the maternal and paternal genomes. However, a proportion of inseminated oocytes exhibit a single pronucleus (1PN), raising uncertainty surrounding their genetic composition and developmental competence. While 1PN zygotes may arise from asynchronous pronuclear formation, parthenogenetic activation, or abnormal syngamy, their clinical use remains debated. Previous studies suggest that a proportion of 1PN embryos are diploid and capable of normal development, though overall implantation and live birth rates are lower compared with 2PN-derived embryos. Indication, the evaluation of their developmental potential is clinically relevant for embryo selection in ART.

Study design: This is a retrospective cohort study conducted at the Ninewells Hospital Dundee Assisted Conception Unit which analysed clinical data from IVF and ICSI treatment cycles. Ethical approval was obtained from SMED Caldicott guardian, and all data was anonymised to ensure patient confidentiality. The study population included all patients undergoing fertility treatment performed between April 1st 2014 and February 21st 2025. A total of 3841 treatment cycles and 26250 inseminated oocytes were included in the final analysis. Development was assessed using the grades given to the embryos at fertilisation check 16-18 hours post insemination using the Gardner grading system. Cycle outcomes including vitrification and transfer with the clinical pregnancy and live birth rates recorded. The primary comparison was between the developmental potential and clinical outcomes of 1PN-derived embryos and 2PN controls.

Results: A total of 1544 1PN and 24706 2PN embryos were included with 1126 of these 1PN derived from IVF and 418 from ICSI. 1PN embryos displayed significantly lower development rates to good quality blastocysts on day 5 (11.85%, $p < 0.001$) than normal embryos, with this greater in IVF cycles than ICSI (15.54% and 1.91%, $p < 0.001$). The majority of good quality 1PN blastocysts are vitrified (90.08) with only 4.96% transferred. The transfer of 1PN embryos gave significantly greater proportion of negative pregnancy tests (81.25%, $p = 0.005$) and live births (12.5%, $p = 0.03$) with three 1PN SETs resulting in live births. These results favouring the increased use of 1PN embryos in transfers in cycles of IVF treatment.

Limitations: This study is limited by its retrospective design and reliance on morphological assessment without routine genetic confirmation of ploidy, which may underestimate chromosomal abnormalities. The relatively small number of

transferred 1PN embryos also restricts the power to assess clinical outcomes, warranting cautious interpretation and further prospective investigation.

Conclusions: This study demonstrates that while 1PN embryos occur in a minority of IVF and ICSI cycles and generally show reduced developmental potential compared with 2PN counterparts, a proportion are capable of progressing to high-quality blastocysts and achieving live births. This highlights the limitation of morphology alone in predicting ploidy and competency. Although clinical outcomes from 1PN transfers remain lower, their use may be justified in selected cases particularly for patients who have a low number of oocytes or repeated failed fertilisation. These results favour the re-evaluation of 1PN embryos and their use in clinical practice.

P6

Ethical and social implications for using in vitro gametogenesis for human sperm: A UK student survey

Miss Genna Fletcher[1]
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Study aims: This thesis aims to explore the various applications of sperm cells derived through IVG and to determine acceptance levels amongst a UK-based population

Background: In vitro gametogenesis (IVG) aims to recapitulate the development of gametes outside the human body, in a laboratory setting from pluripotent stem cells. Recent scientific advancements have led to successful in vitro spermatogenesis in mouse models, with mature sperm cells producing fertile offspring following successful in vitro fertilisation (IVF). Researchers have also achieved the first step in human germ cell differentiation, and it is likely that IVG technology will be developed for clinical use in the coming years. IVG has the potential to revolutionise the reproductive medicine landscape by offering novel solutions to existing infertility scenarios and enabling the formation of new family types. The development of IVG technology as a clinical treatment raises important ethical and social dilemmas that must be addressed prior to its implementation. Studies investigating public opinion Japan (Akatuska et al., 2021), Belgium (Mertes et al., 2021) and The Netherlands (Hendriks et al., 2017) have observed an emerging positive view of IVG with some limitations for use.

Study design and methodology: An online survey was designed to investigate the acceptability of proposed applications of IVG technology in a UK based sample. The survey was distributed to undergraduate medical and medical science students aged between 17 and 29 in the UK and 55 responses were received.

Results: Overall, a high level of acceptance was received towards IVG, with 84% believing that it is ethical to produce sperm cells from induced pluripotent stem cells (iPSCs) and 79% for sperm cells derived from embryonic stem cells (ESCs). 83% and 73% of participants deemed clinical use of iPSC-derived sperm cells and ESC-derived sperm cells, respectively. The sample also supported the use of these cells in research applications such as improving our knowledge of sperm function (88%) and research to improve clinical outcomes during fertility treatments (83%). In terms of specific clinical applications a majority accepted the use of IVG sperm cells in cases where other fertility treatments have been unsuccessful (82%), for males who do not produce their own sperm due to medical conditions (81%), to enable same sex couples to have genetically related children (77%), and to aid fertility preservation (58%). Applications that challenge the traditional two-parent model were least accepted: posthumous reproduction (14%), solo reproduction (31%) and multiplex parenting (17%).

Limitations: Due to the limited response rate and sample size, it is difficult to generalise this data to a wider UK population.

Conclusions: In conclusion, this study found broad support for IVG technology with some limitations for its use, which reflects similar observations in other countries. These results support further investigations in a wider UK population to inform future policy makers and funding bodies.

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One-size-fits-all: Evaluating a standardised cryopreservation protocol and the effect of a post-thaw wash step on motile sperm recovery

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Abstract Title:

One-size-fits-all: Evaluating a standardised cryopreservation protocol and the effect of a post-thaw wash step on motile sperm recovery

Study Question:

Does a single, standardised cryopreservation protocol provide consistent post-thaw outcomes across all human semen samples, and can a controlled post-thaw wash step improve motility recovery?

What is already known:

Semen cryopreservation is widely used in assisted reproduction and fertility preservation, yet post-thaw outcomes remain unpredictable. Current protocols adopt a “one-size-fits-all” approach, assuming equal cryotolerance across all samples. However, variability can result from biological factors and technical inconsistencies, as cryoprotectant addition is rarely standardised for drop size, frequency, or equilibration time. Post-thaw handling can further reduce sperm recovery due to abrupt osmotic shifts when cryoprotectant is removed in a single step. Some protocols, such as Quinn’s Advantage™, include a brief post-thaw wash step, but there is limited published evidence supporting its effectiveness.

Study design and methodology:

This study was conducted at the University of Dundee under ethics approval (SMED REC 20/45). Fourteen ejaculates from seven assumed normozoospermic donors, pre-screened according to WHO 6th Edition reference criteria, were included. Samples were cryopreserved following the ORIGIO CryoSpermTM Sperm Freezing Medium protocol and stored for a minimum of 2 hours. Motility was assessed before freezing and after thawing using computer-assisted sperm analysis (CASA). Recovery rates (%), calculated as the percentage of pre-freeze motile or progressively motile sperm retained post-thaw, were used to quantify cryosurvival. Inter- and intra-donor variability were assessed using coefficients of variation (CV), with higher values indicating greater variability. A paired subset (n = 6) compared the standard protocol with a modified version incorporating a post-thaw wash step. Protocol comparisons were performed using paired t-tests ($P < 0.05$; GraphPad Prism v10.5).

Results/findings:

Despite applying a commercially standardised protocol, this study revealed substantial variability in post-thaw recovery, both between donors and across ejaculates from the same donor. Post-thaw recovery varied more than tenfold between donors (total motility 0.75 – 13.70%; progressive 0.55 – 12.56%), with inter-donor recovery rate CV > 78%. Intra-donor variability was also high (CV values up to 84.8%) confirming ejaculate-specific effects. To address biological and technical factors, a modified protocol introducing a controlled post-thaw wash step was evaluated. This intervention significantly increased the mean recovery rates (total motility: 4.88% ± 3.60 to 10.55% ± 8.01; progressive: 4.96% ± 2.91 to 9.39% ± 5.54; $P < 0.05$). However, this modification had minimal effect on variability (standard protocol CV: total motility 73.7%, progressive 58.6%; modified protocol CV: total motility 75.9%, progressive 57.9%), indicating that procedural changes alone cannot address underlying biological heterogeneity.

Limitations:

The study involved a small cohort (n = 7) and limited number of paired samples (n = 6). Outcomes were restricted to motility recovery and did not assess functional indicators such as DNA integrity or fertilisation potential. Results reflect a single commercial medium and short-term storage in a research setting.

Conclusions:

This study shows that a “one-size-fits-all” cryopreservation protocol cannot consistently accommodate biological diversity, resulting in unpredictable post-thaw outcomes. Before the extent of true biological variability can be defined, protocols must be strictly standardised to eliminate operator-dependent steps, allowing full optimisation of results. While the addition of a post-thaw wash step improved recovery of motile sperm, variability between samples remained evident. This wash step should be evaluated alongside other cryopreservation protocols to determine if similar improvements can be achieved. Future progress will require identifying biomarkers and predictive strategies to enable personalised cryopreservation approaches, optimising efficiency and ultimately increasing clinical success.

Authors List