Abstract citation ID: deaf097.1023

P-717 First pregnancies after using a simplified low-cost IVF system in a newly designed mobile IVF laboratory: a pilot-study

G. Boshoff[1], C. Huyser[1], W. Ombelet[2]

[1]University of Pretoria, Obstetrics and Gynaecology, Pretoria, South Africa
[2]Hasselt University, Faculty of Medicine and Life Sciences, Hasselt, Belgium

Study question: Can a functional IVF workroom, using The Walking Egg simplified embryo culture system, be converted to a mobile laboratory?

Summary answer: A pilot study showed a mobile IVF laboratory can be used to culture embryos, with transfers resulting in clinical pregnancies.

What is known already: Access to quality reproductive care is required in low- and middle-income countries. In South Africa, which is seen as a Reproductive hub in Africa, the Medical Assisted Reproduction (MAR) industry, with less than 30 IVF clinics, fail to provide sufficient Assisted Reproductive Treatment (ART) cycles to a population of > 60 million people.

Patients travel extensive distances to reach ART units, whereby distance decay is seen from patients residing further from healthcare facilities. A mobile IVF laboratory can provide ART services through immediate access. Rural and remote areas can be reached without cost-escalation consequences to set up fully functional MAR units.

Study design, size, duration: The design and commissioning of an IVF laboratory "on wheels" was performed in Pretoria, South-Africa, as part of a PhD project focusing on improving accessibility to MAR, i.e. to design and construct a prototype laboratory, ready for use during 2024. Thereafter an ART pilot study was initiated (September - November 2024). A total of 10 patients, with a relatively good prognosis, undergone ART cycles with conventional insemination and transfer, with excess embryos cryopreserved.

Participants/materials, setting, methods: The pilot study was performed in a rural town in South Africa, simulating a real-world scenario where the mobile IVF laboratory could be used. The patients (n = 10) were recruited from a local IVF clinic. Ovarian aspiration procedures were performed in the IVF clinic's procedure room, and the aspirates were transported to the mobile laboratory. Embryos were cultured using the low-cost Walking Egg simplified culture system and ultrasound-guided embryo transfers were performed at the mobile laboratory.

Main results and the role of chance: The mobile IVF laboratory was designed, considering various mobile options, cost implications and specialised manufacturers. A prototype of this design was commissioned and after passing several levels of quality control verifications, a pilot study of 10 patients was launched to further test the mobile laboratory.

The study population's average ages were 32.5±5.1 and 38.8±3.5 years old (female and male, respectively). A mild ovarian hyperstimulation was used for all patients including gonadotrophins, clomiphene citrate, GnRH antagonist, and an hCG trigger. An average of 6.4±4.9 cumulus-oocyte complexes were retrieved per patient. A 61% fertilization was achieved, of which 62% of the zygotes developed sufficiently to be used for embryo transfer or cryopreservation.

From 10 embryo transfers, 5 patients had two embryos returned and 5 had a single embryo transferred. Eight transfers were performed on day 5 of development, one on day 3, and another as a frozen embryo transfer. Positive blood βHCG levels were reported for 5 of the 10 patients, with four ongoing singleton pregnancies and one biochemical pregnancy. Four patients had excess embryos available after embryo transfer, which were cryopreserved.

Limitations, reasons for caution: Valuable insight was obtained about limitations when designing and setting-up a mobile laboratory. Manpower needed to transport aspirates from the clinic to the laboratory should be considered, when planning future attempts. Additionally, health professionals' willingness to consider unconventional protocols should be taken into account.

Wider implications of the findings: The proof-of-concept confirms the realization to perform embryo cultures and transfers in a mobile IVF laboratory and achieve pregnancies. This can be a valuable tool in areas where access to MAR is limited due to few IVF centres that are mainly found in large cosmopolitan centres.

Trial registration number: No