The effect of sequential embryo transfer on pregnancy outcomes in patients with recurrent implantation failure: a systematic review and meta-analysis of randomized controlled trials

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Background

Recurrent implantation failure (RIF) is defined as the inability of transferred embryos to successfully implant after undergoing at least three consecutive vitro fertilization/ intracytoplasmic sperm injection (IVF/ICSI) cycles, each with 1–2 high-quality embryos. The occurrence rate of RIF stands at 8–15%, presenting significant obstacles and challenges for clinicians and embryologists.

Sequential embryo transfer is an approach that involves a two-step process, starting with cleavage embryo transfer followed by blastocyst transfer in the same cycle. Several studies suggested that sequential embryo transfer can significantly improve the clinical outcomes of IVF/ICSI-ET cycles. However, there is a point of controversy regarding its effectiveness in patients with RIF.

Objectives

The aim of our study was to assess the impact of sequential embryo transfer on pregnancy outcomes among patients with RIF.

Methods

Four different databases (PubMed, Cochrane Library, Scopus, and ISI web of science) were searched for the available trials from inception to January 2024.

Randomized controlled trials (RCTs) were included if they compared sequential embryo transfer with other transfer protocols in infertile women with RIF.

The primary outcome was the ongoing pregnancy rate. The secondary outcomes were the rates of chemical pregnancies, clinical pregnancies, miscarriages, and multiple pregnancies.

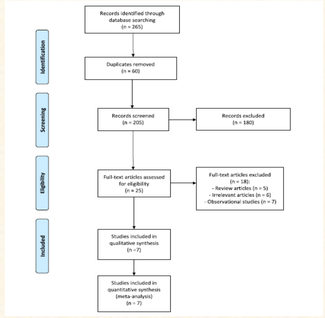

Figure 1. PRISMA flow diagram.

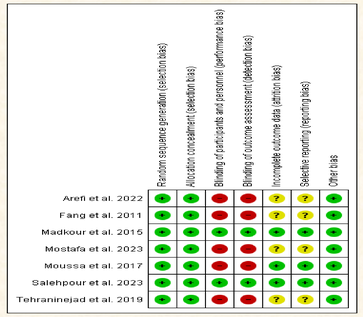

Figure 2. Risk of bias summary.

Results

Seven RCTs met our inclusion criteria with a total number of 909 patients in which 456 were in the sequential transfer group and 453 were in the control group.

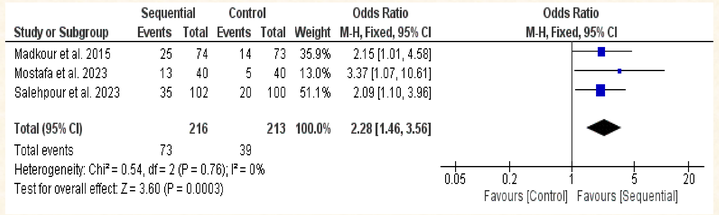

Figure 3. Ongoing pregnancy rate.

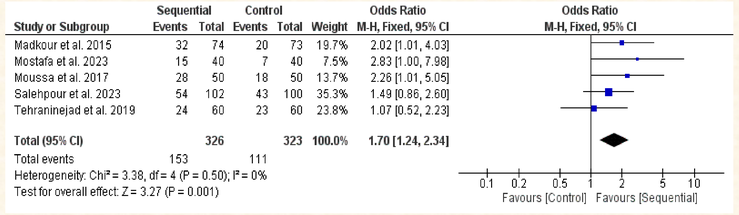

Figure 4. Chemical pregnancy rate.

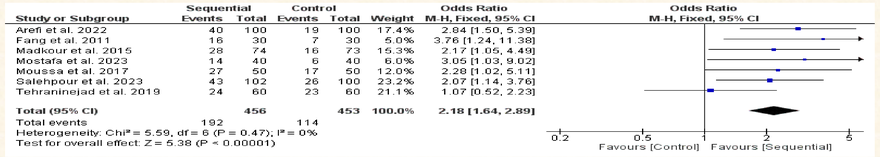

Figure 5. Clinical pregnancy rate.

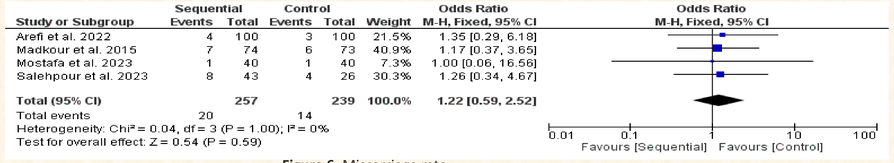

Figure 6. Miscarriage rate.

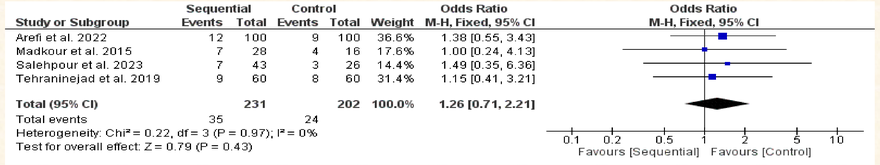

Figure 7. Multiple pregnancy rate.

Conclusion

Sequential embryo transfer shows promise in enhancing pregnancy outcomes among RIF patients. However, additional trials are warranted to validate our findings.

Limitations of the Study:

The main limitations of our meta-analysis are the limited number of studies that met our inclusion criteria and different demographic characteristics of the included studies. Additionally, most of the included studies lacked blinding. Moreover, we did not analyze the outcome of live birth rate extensively.

Reference

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2. Madkour WAI, Noah B, Zaheer H etlal (2015) Does sequential embryo transfer improve pregnancy rate in patients with repeated implantation failure? A randomized control study. Middle East Fertil Soc J 20:255–261.

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