INPLASY PROTOCOL

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None declared.

Effect of prior COVID-19 infection in women on assisted reproductive outcomes: a systematic review and meta-analysis

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Review question / Objective: **Does prior COVID-19 infection in women have an impact on assisted reproductive outcomes?/ The objective of this study is to investigate the effect of COVID-19 infection history on assisted reproductive therapy, including cycle characteristics, laboratory outcomes and pregnancy outcomes.**
Condition being studied: **Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has spread rapidly and become a global pandemic since late 2019. Due to the increasing number of cases, more attention has been paid to the potential damage caused by prior COVID-19 infection to the body, including the impact on fertility and assisted reproductive technology (ART) outcomes. However, most of these studies have small sample sizes and short follow-up periods, which made the conclusions of individual studies less stable and inconsistent.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 March 2023 and was last updated on 26 March 2023 (registration number INPLASY202330106).

INTRODUCTION

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METHODS

Participant or population: Women undergoing assisted reproductive treatment.

Intervention: Patients in the exposed group had a history of COVID-19 infection and had now recovered.

Comparator: Patients in the control group had not been infected in the past.

Study designs to be included: Prospective or retrospective cohort.

Eligibility criteria: The searched literature was considered eligible if the following criteria were reached: (1) The study was prospective or retrospective cohort; (2) patients in the exposed group had a history of COVID-19 infection and had now recovered, while the control group were those who had not been infected in the past; (3) the outcomes were determined in priori, including any data regarding cycle characteristics, laboratory parameters, and pregnancy rates.The searched literature was considered eligible if the following criteria were reached: (1) The study was observational which included cross-sectional, cohort, or case-control design; (2) patients in the exposed group had a history of COVID-19 infection and had now recovered, while the control group were those who had not been infected in the past; (3) the outcomes were determined in priori, including any data regarding cycle characteristics, laboratory parameters, and pregnancy rates.The searched literature was considered eligible if the following criteria were reached: (1) The study was observational which included cross-sectional, cohort, or case-control design; (2) patients in the exposed group had a history of COVID-19 infection and had now recovered, while the control group were those who had not been infected in the past; (3) the outcomes were determined in priori, including any data regarding cycle characteristics, laboratory parameters, and pregnancy rates.The searched literature was considered eligible if the following criteria were reached: (1) The study was observational which included cross-sectional, cohort, or case-control design; (2) patients in the exposed group had a history of COVID-19 infection and had now recovered, while the control group were those who had not been infected in the past; (3) the outcomes were determined in priori, including any data regarding cycle characteristics, laboratory parameters, and pregnancy rates. The cycle characteristics were stimulation duration, gonadotropin dose, peak estradiol level, and endometrial thickness. The laboratory outcomes we focused on consisted of the number of oocytes, number of mature oocytes, oocyte maturation rate, number of fertilized oocytes, fertilization rate, number of good-quality embryos, as well as good-quality embryo rate. The pregnancy outcomes included biochemical pregnancy, clinical pregnancy, embryo implantation, early miscarriage and ongoing pregnancy.

Information sources: PubMed, Web of Science, EMBASE and Cochrane Library from inception to December 16, 2022, without restriction of language. In addition, we also reviewed the reference list of the identified literature to ensure that potentially pertinent records in the field were not missed.

Main outcome(s): The primary outcomes were the number of oocytes and clinical pregnancy rate.

Quality assessment / Risk of bias analysis: Newcastle-Ottawa Scale (NOS) was applied to evaluate the methodological quality of included studies according to the study design. The three dimensions affecting the

overall quality score include cohort selection, comparability, and outcome evaluation, with a total score of 9.

Strategy of data synthesis: Data synthesis was carried out using Review Manager. In all included studies, post-matching outcomes were prioritized for analysis. The continuous data was pooled into mean differences (MDs) with 95% confidence intervals (CIs), while dichotomous data was pooled as odds ratios (ORs) with 95% CIs. When needed, the sample mean and standard deviation were estimated from medians, ranges, interquartile ranges, or 95% CIs (https://www.math.hkbu.edu.hk/~tongt/papers/median2mean.html). The random-effects model was adopted for meta-analysis.

Subgroup analysis: Subgroup analyses were performed for the oocyte number and clinical pregnancy rate based on the study design (retrospective or prospective) and the sample size (more or less than 100).

Sensitivity analysis: Sensitivity analysis was conducted by sequentially excluding one paper at a time.

Language restriction: The search process was not restricted by language.

Country(ies) involved: China.

Keywords: COVID-19, SARS-CoV-2, infection, assisted reproductive technology, fertility.

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