

Exploring uterine niche: a systematic review on secondary infertility rates, pathophysiological correlations, impact on ART, and the efficacy of surgical interventions

Citation

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Review question

1. What is the prevalence of secondary infertility associated with the uterine niche?
2. What are the pathophysiological mechanisms to explain secondary infertility associated with the uterine niche?
3. Does uterine niche affect implantation position and placenta formation?
3. Does the uterine niche affect the outcome of artificial reproduction techniques?
4. What is the best surgical option for uterine niche repair to achieve favourable fertility outcomes?
5. What is the quality and level of research evidence for findings related to questions 1 to 4? Can we arrive at solid conclusions?

Searches [1 change]

PubMed

ScienceDirect

Cochrane Library

Embase

Publication dates will not be restricted during the search. However, only English-language articles will be searched by applying a search filter. Thus, only one search limitation will be applied.

Additional search strategy information can be found in the attached PDF document (link provided below).

Search strategy

https://www.crd.york.ac.uk/PROSPEROFILES/526319_STRATEGY_20240319.pdf

Types of study to be included

The inclusion criteria for this study will encompass various study designs, including Randomized Controlled Trials (RCTs), Case-Control Studies, Cross-Sectional Studies, Cohort Studies, and Case Series. Full-text articles written in the

English language will be considered eligible for inclusion. Systematic reviews or meta-analyses will be excluded.

Condition or domain being studied

A uterine niche is a reservoir-like cavity in the anterior uterine isthmus where a previous Caesarean section scar exists. Its occurrence results from imperfect or impaired tissue healing. There's also a growing concern about the likelihood of secondary infertility that might be attributed to the presence of a uterine niche. Several theoretical mechanisms have been proposed to elucidate infertility associated with uterine niches. These mechanisms encompass a range of factors. Firstly, there is the notion that the environment for sperm penetration and implantation may be compromised due to the accumulation of intrauterine fluid, altered uterine contractility stemming from fibrosis, and the buildup of mucus and old blood within the niche. Secondly, a physical barrier to embryo transfer and implantation may exist, which can hinder the successful progression of an embryo. Lastly, it's suggested that psychogenic factors may come into play, potentially diminishing the likelihood of a successful pregnancy in cases involving uterine niches.

Participants/population

Women of reproductive age (15-49) with a uterine niche confirmed through standard diagnostic techniques will be included in the study. Women with any other concomitant gynecological pathology will be excluded.

Intervention(s), exposure(s)

A uterine niche confirmed through standard diagnostic techniques

Comparator(s)/control

Women of reproductive age (15-49) without a uterine niche confirmed through standard diagnostic techniques

Main outcome(s)

The outcomes will include the incidence of secondary infertility in women with uterine niche, the underlying pathophysiological basis for the association between uterine niche and fertility, the impact of uterine niche on Assisted Reproductive Technology (ART), and the effectiveness of surgical interventions in restoring fertility through uterine niche repair.

Additional outcome(s)

None

Data extraction (selection and coding)

The study selection process will be meticulously conducted in two phases, employing a semi-automated Rayyan tool. One author will serve as the primary reviewer, while another acted as a collaborator, and a blind approach will be adopted throughout. In the initial round, titles and abstracts will be screened to eliminate duplicates and ineligible entries, with conflicts resolved by the reviewer. The second round will follow a similar blind approach for full-text screening, with conflicts again resolved by the reviewer. In cases requiring additional information, authors will be contacted. The transparent reporting of the study selection process will be documented using the PRISMA 2020 flow diagram for updated systematic reviews. The study characteristics pertinent to the outcomes, including the incidence of secondary infertility in women with uterine niche, the underlying pathophysiological basis for the association between uterine niche and fertility, the impact of uterine niche on Assisted Reproductive Technology (ART), and the effectiveness of surgical interventions in restoring fertility through uterine niche repair, will be meticulously extracted and systematically

organized into predefined tables.

Risk of bias (quality) assessment

The quality assessment of cohort and case-control studies in this research will be conducted using the Newcastle-Ottawa Scale (NOS). The Risk of Bias 2 tool will be employed for randomized controlled trials to assess the quality. However, specific quality assessment tools will be unavailable for evaluating some studies like case series.

Strategy for data synthesis [1 change]

A qualitative approach will synthesize data due to the heterogeneity of study designs, outcomes, and methodologies. Each key research question will separately be addressed to synthesize the findings to provide a comprehensive understanding of each area.

1. Incidence of secondary infertility among women with uterine niche: The studies reporting the incidence of secondary infertility in women with uterine niche will be summarized, giving an overall range for the incidence of secondary infertility.
2. Pathophysiological basis for secondary infertility associated with uterine niche: The underlying mechanism will be explored to explain the scientific basis of secondary infertility. Evidence regarding the alteration of the intrauterine environment, alterations in implantation position, placental formation, and potential barriers to embryo transfer will be summarized. Research gaps also will be identified.
3. Impact of uterine niche on ART: Study data will be synthesized to explain implantation rates, ART success rates, pregnancy outcomes, and any other complications associated with ART occurring in women with uterine niche.
4. Efficacy of surgical interventions in uterine niche repair: The studies investigating different surgical techniques, their success rates, recurrence rates, and post-surgical reproductive outcomes will be synthesized to identify the optimal surgical approach for uterine niche repair.

Thus, qualitative data synthesis will be done for each subtopic, findings will be summarized, patterns and inconsistencies will be identified, and conflicting results will be discussed. Each study finding will be analyzed logically, and the study protocol's depth and drawbacks will be discussed. Research gaps will be identified and will be used to trigger further research.

Analysis of subgroups or subsets

No subgroup analysis will be conducted.

Contact details for further information

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Type and method of review

Systematic review

Anticipated or actual start date

01 April 2024

Anticipated completion date

01 July 2024

Funding sources/sponsors

None

Grant number(s)

State the funder, grant or award number and the date of award

None

Conflicts of interest

Language

English

Country

Sri Lanka

Stage of review

Review Ongoing

Subject index terms status

Subject indexing assigned by CRD

Subject index terms

MeSH headings have not been applied to this record

Date of registration in PROSPERO

28 March 2024

Date of first submission

19 March 2024

Stage of review at time of this submission

The review has not started

Stage	Started	Completed
Preliminary searches	No	No
Piloting of the study selection process	No	No
Formal screening of search results against eligibility criteria	No	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

The record owner confirms that the information they have supplied for this submission is accurate and complete and they understand that deliberate provision of inaccurate information or omission of data may be construed as scientific misconduct.

The record owner confirms that they will update the status of the review when it is completed and will add publication details in due course.

Versions

28 March 2024