

Amniocentesis is safe, acceptable, and feasible in threatened preterm labour – a systematic review

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Objective

There have been no new strategies for the prevention of preterm birth in the last two decades or more. The analysis of amniotic fluid has been advocated by many to identify the mechanisms driving threatened preterm labour to find therapeutic options.

Amniocentesis is largely considered to be safe, but patient and care provider concerns exist in the setting of threatened preterm labour. This systematic review of the literature critically reviews the published literature and will help inform the counselling and clinical decision-making, of patients and care providers alike.

Data sources and eligibility

10215 studies were returned after searches were conducted in MEDLINE, EMBASE, EMCARE, Web of Science, and SCOPUS databases using free text and Medical Subject Headings (MESH). 399 studies were assessed for eligibility with 15 studies being included in the final review. The main reason for exclusion from the review was an absence of safety data.

All English language, peer-reviewed human studies where amniocentesis was used to sample the amniotic fluid of patients presenting with threatened preterm labour or PPRM and published between January 1990 and March 2022 were included.

Selection Process

Two authors (DS and SS) screened all titles and abstracts independently, excluded studies deemed to be irrelevant, and then independently assessed the remaining full text articles for eligibility. Any disagreements were resolved by consensus. Studies were included where information was provided relating to any of the following: rate of uptake of amniocentesis, success rates of retrieval of amniotic fluid, safety, and complications.

Results

In this systematic review of amniocentesis performed in cases of PPRM or threatened PTL, we found an overall complication rate of 0.35%.

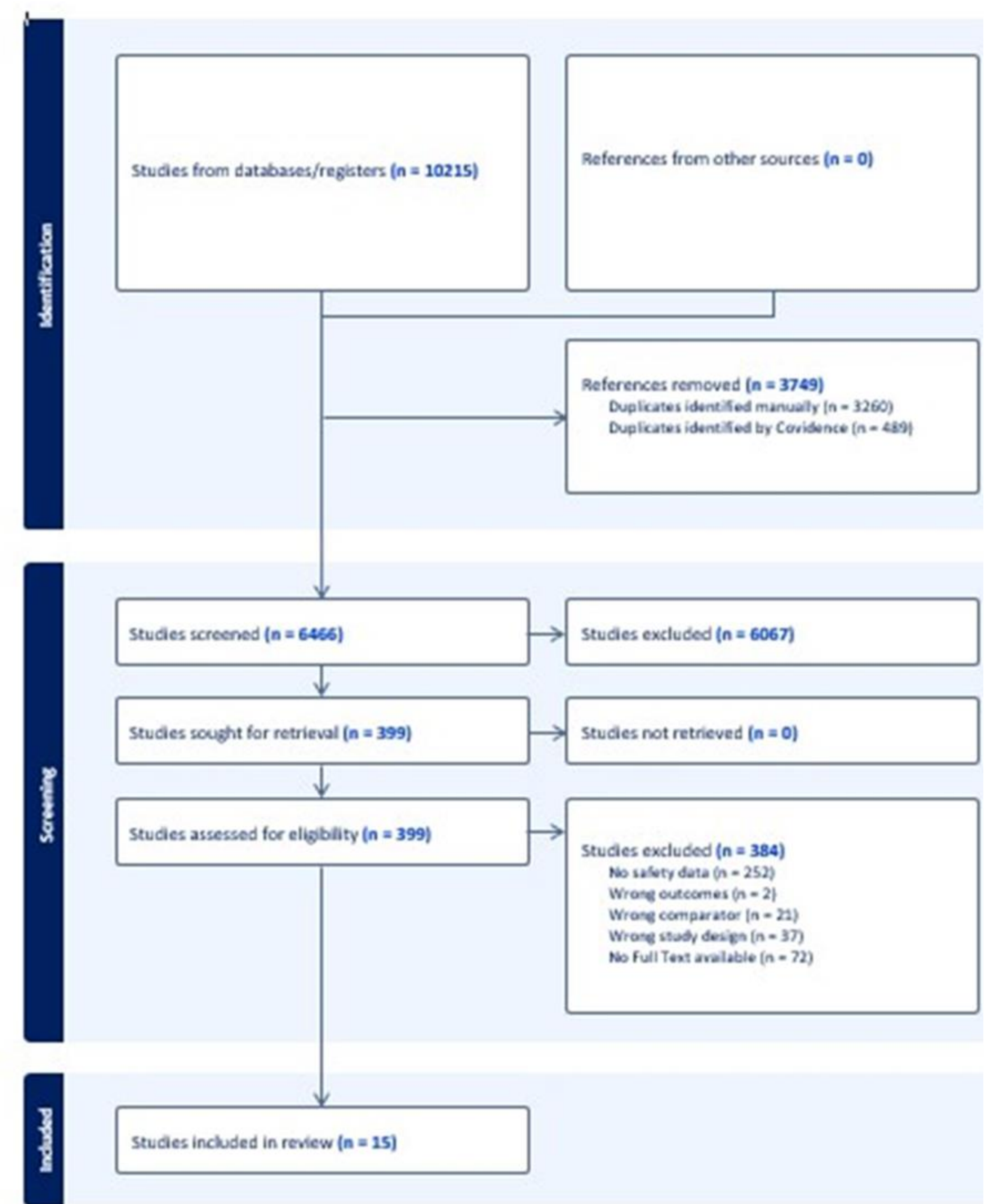
In addition to the safety profile of amniocentesis we demonstrate that success rates of the procedure are consistently high (>90%) across all units reporting data.

We also demonstrate that uptake rates of amniocentesis in cases of PPRM and threatened PTL ranged widely between units. Uptake rates of 57.5% in a centre conducting a prospective observational research study compare starkly to uptake rates of over 99% in centres where amniocentesis is part of standard clinical practice

Reported Adverse Events

Three studies reported risks associated with amniocentesis in the context of PPRM or threatened preterm labour. There were 4 reported complications in 1119 cases – two umbilical vessel punctures, and two chorionic plate vessel injuries (MFAET Grade 2 “moderate” fetal haemorrhage). None of the injuries resulted in a change of management of the patient, the need for emergency delivery or lasting harm to the mother or fetus. There were no haemorrhagic or infective maternal complications.

PRISMA Diagram



Conclusions

This systematic review found that amniocentesis in cases of PPRM or threatened preterm labour is a safe and feasible procedure.

Where reported, transient moderate complications occurred in 0.35% of cases, and success rates of greater than 90% were observed across all studies, even in the theoretically more complex situation of PPRM.

At A Glance

Why was this study conducted?

The advancement in point of care diagnostics to identify infection and inflammation raises the possibility of using amniotic fluid collected at amniocentesis to risk stratify and treat those in threatened preterm labour.

What are the key findings?

Amniocentesis in this context is a safe, successful, and acceptable procedure, with a complication rate of 0.35%. No complications resulted in lasting harm to the mother or the fetus

What does this study add to what is already known?

This study synthesises data from seven different countries, and confirms the safety of the procedure, addressing known concerns shared by patients and care providers alike.

Study	PPROM / PTL / BOTH	Number	Complications
Angus <i>et al</i> 2001	PTL (n=66) PTL (n=11)	77	0
Leanos-Miranda <i>et al</i> 2021	PTL (intact membrane)	452	0
Musilova <i>et al</i>	PPROM	590	4 (0.6%)

