UK National Screening Committee

Evidence map: Parvovirus B19 Infection in Pregnancy

A literature search to outline the volume and type of evidence related to screening pregnant women for susceptibility to parvovirus B19 infection

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The UK National Screening Committee secretariat is hosted by Public Health England.

About the UK National Screening Committee (UK NSC)

The UK NSC advises ministers and the NHS in the 4 UK countries about all aspects of population screening and supports implementation of screening programmes.
Conditions are reviewed against evidence review criteria according to the UK NSC's evidence review process.

Read a complete list of UK NSC recommendations.

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Summary

This document presents the findings of an evidence map on screening for susceptibility to parvovirus B19 infection in pregnancy.

Evidence maps are a way of scanning published literature to look at the volume and type of evidence in relation to a specific topic. They are designed to provide information on whether there is sufficient evidence to justify commissioning an external review on the topic under consideration.

The literature searches for this evidence map did not retrieve any relevant studies for the key areas of interest for this topic. Based on the findings of the evidence map, a rapid review on screening for susceptibility to parvovirus B19 in pregnancy should not be commissioned at the present time.

The UK National Screening Committee (UK NSC) will return to screening for susceptibility to parvovirus B19 infection in pregnancy in 3 years' time.

Introduction and approach

Background & Objectives

The UK National Screening Committee (UK NSC) external reviews (also known as evidence summaries or evidence reviews) are developed in keeping with the UK NSC evidence review process, to ensure that each topic is addressed in a proportionate manner. Further information on the evidence review process can be accessed online.

Screening women for susceptibility to parvovirus B19 infection is a topic currently due for an external review.

The UK NSC currently recommends against screening pregnant women for susceptibility to parvovirus B19 infection. The Committee based this recommendation on the evidence provided by the 2014 brief review of the literature on parvovirus B19 in pregnancy[i], carried out by Professor Catherine Peckham.

The 2014 review of the literature was undertaken to inform a UK NSC decision on whether a full review of the evidence on screening was required at that time. The literature search identified a 2011 review on parvovirus B19 infection in pregnancy by Lamont et al, which identified a broad range of research needs in the areas of seroprevalence, the testing process, prevention and treatment.[ii]

The 2014 review concluded that there was a lack of evidence in the key areas of the testing process, prevention of maternal acquisition of infection, prevention of transmission of infection to the fetus, and treatment of the affected fetus. Due to these knowledge gaps and the need for research in areas fundamental to the introduction of a screening programme, the review concluded that it was unlikely that a full literature review would find sufficient evidence to justify a screening programme. Preliminary work was undertaken in 2018 to gauge whether this situation has changed. This took the form of an internally developed evidence map.

Evidence maps are rapid evidence products which aim to gauge the volume and type of evidence relating to a specific topic. This approach has been used for this topic to support decision making on whether or not the evidence is sufficient to justify commissioning an external rapid review of the evidence.

The evidence map focused on whether a vaccination for parvovirus B19 has been identified, and whether there have been studies on interventions in pregnancy to prevent transmission of parvovirus from the mother to the fetus, or reduce its effects in the baby.

The aim of this document is to present the information necessary for the UK NSC to consider whether an evidence summary on screening for susceptibility to parvovirus B19 infection in pregnancy should be commissioned in 2019.

Previous review on screening for susceptibility to parvovirus B19 infection in pregnancy

The previous review[i] stated that most women who have a confirmed parvovirus infection in pregnancy have healthy babies. For the estimated 30 to 40%[i] of pregnant women found to be susceptible to the infection, there was no feasible prevention strategy. For example, no vaccine to prevent acquisition of infection was available. Avoidance of exposure in women of childbearing age was a problematic strategy as women of childbearing age are likely to be in contact with school age children, in whom infection is most common. The review also found no interventions which could prevent transmission of infection from the mother to the fetus, or change the course of the infection if transmitted to the fetus. The only intervention identified was for the proportion of fetuses that developed significant anaemia or hydrops. However, the intervention (intrauterine blood transfusion), was associated with treatment related harm to the fetus.

A 2011 review on parvovirus B19 infection in pregnancy by Lamont et al identified a broad range of research needs relating to seroprevalence, the testing process, prevention and treatment[ii]. The 2014 review concluded that due to the need for research on fundamental issues in relation to screening, it was unlikely that a full literature review would find sufficient evidence to justify a screening programme.

Evidence map

This evidence map has been developed as part of a process to assess whether an update review on screening for parvovirus B19 infection in pregnancy should be commissioned in 2019, by evaluating the volume and type of evidence on key issues related to screening for susceptibility to the virus.

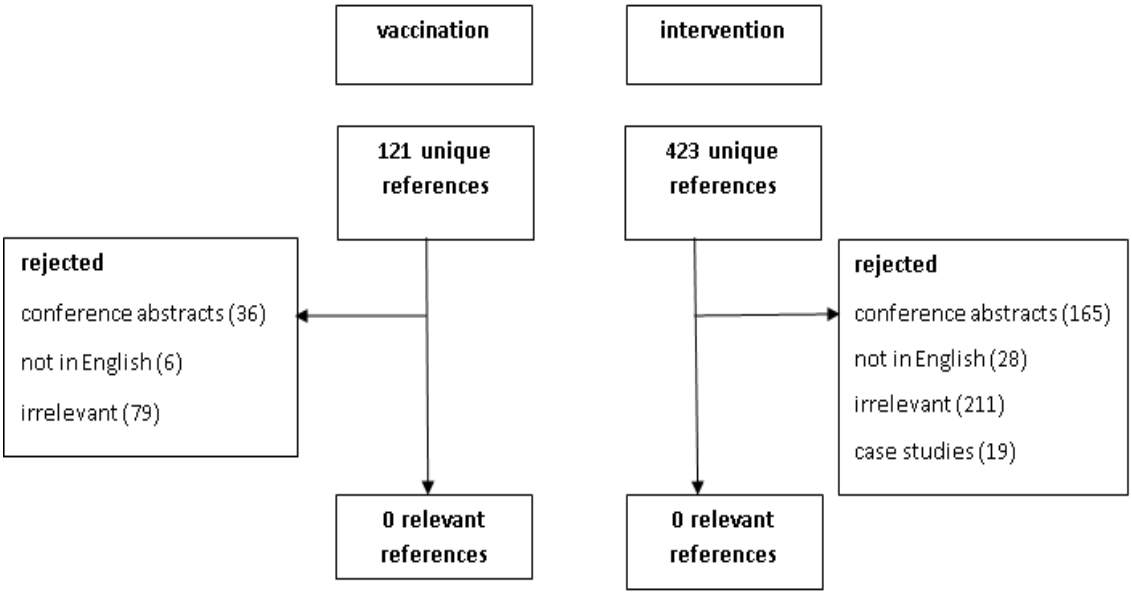
The evidence map aims to address the following questions:

1. Has a vaccination for parvovirus B19 been identified?
2. Have studies of interventions in pregnancy been found to prevent transmission of parvovirus to the fetus or reduce its effects in the baby?

This evidence map will provide the basis for discussion on whether an evidence summary on the topic is justified at this time.

Summary of the evidence map findings

The literature searches for the evidence map were carried out on 3rd July 2018 on three databases: Medline, Embase and the Cochrane Library. The time period was restricted to 2013 – July 2018. The results of the literature search including the search strategy (with inclusion and exclusion criteria) are provided in Appendix 1 (below). After automatic and manual de-duplication, 164 unique references from the vaccination searches (for question 1) and 423 unique references from the intervention searches (for question 2) were sifted for relevance to the questions.



An update literature search (from July 2018 to February 2019), was run on Wednesday 27th February 2019. After sifting the search results for relevance to questions 1 and 2, no relevant references were retrieved. The update search results are provided in Appendix 2.

Question 1: Has a vaccination for parvovirus B19 been identified?

No studies testing a potential vaccine for parvovirus in humans were retrieved.

As no studies testing a potential vaccine for parvovirus B19 in humans were identified, the commissioning of an evidence summary in this area is not currently justified.

Question 2: Have studies of interventions in pregnancy been found to prevent transmission of parvovirus to the fetus or reduce its effects in the baby?

No studies on interventions to prevent, or reduce the effect of, mother-to-child transmission of parvovirus were retrieved. There were several case reports, but few larger studies, on the management of the pregnancy and treatment in the fetus once parvovirus had affected the fetus.

As no studies on interventions to prevent the transmission of parvovirus to the fetus, or reduce the effect of mother-to-child transmission of parvovirus were retrieved in the literature search, the commissioning of an evidence summary in this area is not currently justified.

Outcome

The findings of the evidence map suggest that the evidence base in key areas of the screening topic has not changed sufficiently to warrant the commissioning of an evidence summary at this time. On this basis, it is recommended that an evidence summary on screening for susceptibility to parvovirus B19 infection in pregnancy is not commissioned at the present time.

Conclusions

The findings of the evidence map are unlikely to impact the current UK NSC recommendation on screening for susceptibility to parvovirus B19 infection in pregnancy, as no new evidence has been identified to change the conclusions of the previous review.

Recommendations

The volume and type of evidence related to screening for susceptibility to parvovirus B19 infection in pregnancy is currently insufficient to justify an update review at this stage. It is recommended that the Committee return to this topic in 3 years' time.

Appendix 1 — Search strategy for the evidence map

SOURCES SEARCHED: Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present, Embase 1996 to 2018 Week 27 and the Cochrane Library

DATES OF SEARCH: 2013-2018

SEARCH STRATEGIES:

Medline	**Embase**
VACCINATION **1.** human parvovirus.tw. (1640) **2.** parvovirus 19.tw. (6) **3.** 1 or 2 (1645) **4.** parvovirus.tw. (7896) **5.** limit 4 to humans (4717) **6.** PARVOVIRUS B19, HUMAN/ (2664) **7.** 3 or 5 or 6 (5072) **8.** vaccin$.tw. (276782) **9.** *VACCINATION/ (41169) **10.** Vaccines, Synthetic/ad [Administration & Dosage] (3284) **11.** Viral Vaccines/ad, im [Administration & Dosage, Immunology] (12904) **12.** Adjuvants, Immunologic/ad [Administration & Dosage] (8313) **13.** 8 or 9 or 10 or 11 or 12 (291461) **14.** 7 and 13 (197) **15.** limit 14 to yr="2013 -Current" (45) **INTERVENTIONS** **1.** human parvovirus.tw. (1640) **2.** parvovirus 19.tw. (6) **3.** 1 or 2 (1645) **4.** parvovirus.tw. (7896) **5.** limit 4 to humans (4717) **6.** PARVOVIRUS B19, HUMAN/ (2664) **7.** 3 or 5 or 6 (5072) **8.** Infectious Disease Transmission, Vertical/pc [Prevention & Control] (6497)	**VACCINATION** **1.** human parvovirus.tw. (1326) **2.** parvovirus 19.tw. (13) **3.** 1 or 2 (1337) **4.** parvovirus.tw. (7132) **5.** limit 4 to human (4669) **6.** Human parvovirus B19/ (1348) **7.** 3 or 5 or 6 (5207) **8.** vaccin$.tw. (258476) **9.** *vaccination/ (33580) **10.** recombinant vaccine/ (5213) **11.** virus vaccine/ (12634) **12.** immunological adjuvant/ (10365) **13.** 8 or 9 or 10 or 11 or 12 (268433) **14.** 7 and 13 (272) **15.** limit 14 to yr="2013 -Current" (89) **INTERVENTIONS** **1.** human parvovirus.tw. (1326) **2.** parvovirus 19.tw. (13) **3.** 1 or 2 (1337) **4.** parvovirus.tw. (7132) **5.** limit 4 to human (4669) **6.** Human parvovirus B19/ (1348) **7.** 3 or 5 or 6 (5207) **8.** vertical transmission/pc [Prevention] (456) **9.** (vertical transmission or mother-to-child transmission or MTCT).tw. (10155) **10.** transmission.ti. (43850)

9. (vertical transmission or mother-to-child transmission or MTCT).tw. (9328) **10.** transmission.ti. (61360) **11.** 8 or 9 or 10 (69966) **12.** Pregnancy Outcome/ (45229) **13.** Fetal Death/ (23898) **14.** Abortion, Spontaneous/ (18640) **15.** Hydrops Fetalis/ (2126) **16.** (hydrops fetalis or fetal hydrops).tw. (2909) **17.** ((fetal or fetus) adj2 (loss or death)).tw. (9403) **18.** fetus hydrops.tw. (5) **19.** ((birth or pregnancy) adj2 (outcome$ or complication$)).tw. (36818) **20.** 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 (110008) **21.** (therap$ or treat$ or interven$).ti. (2033937) **22.** THERAPEUTICS/ (8305) **23.** Treatment outcome/ (848444) **24.** 21 or 22 or 23 (2643128) **25.** 11 or 20 or 24 (2808725) **26.** 7 and 25 (973) **27.** limit 26 to yr="2013 -Current" (136)	**11.** 8 or 9 or 10 (50327) **12.** pregnancy outcome/ (47169) **13.** fetus death/ (13170) **14.** spontaneous abortion/ (29767) **15.** fetus hydrops/ (3584) **16.** (hydrops fetalis or fetal hydrops).tw. (2720) **17.** fetus hydrops.tw. (1) **18.** ((fetal or fetus) adj2 (loss or death)).tw. (9320) **19.** ((birth or pregnancy) adj2 (outcome$ or complication$)).tw. (47711) **20.** 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 (107934) **21.** therapy/ (382234) **22.** (therap$ or treat$ or interven$).ti. (1795618) **23.** treatment outcome/ (764424) **24.** treatment response/ (219837) **25.** 21 or 22 or 23 or 24 (2706670) **26.** 21 or 22 or 23 or 24 (2706670 **27.** 11 or 20 or 26 (2848191) **28.** 7 and 27 (1198) **29.** limit 28 to yr="2013 -Current" (380)
Cochrane	
#1 "parvovirus B19":ti,ab,kw (Word variations have been searched) (41) **#2** human parvovirus:ti,ab,kw (Word variations have been searched) (62) **#3** MeSH descriptor: [Parvovirus B19, Human] this term only (9) **#4** #1 or #2 or #3 (30) Publication Year from 2013 to 2018	

All searches carried out on 3 July 2018

Results by database

	vaccination	intervention
Medline	**45**	**136**
Embase	**89**	**380**
Cochrane Library	**30**	**30**

Total	**164**	**546**

After automatic and manual de-duplication, 164 unique references from the vaccination searches and 423 unique references from the intervention searches were sifted for relevance to the review.

Inclusions and exclusions:
Case reports, conference abstracts and publications not in English were excluded.
Studies were included if the number of patients was 10 or more.

Appendix 2 — Search update for the parvovirus B19 evidence map

The searches for the parvovirus evidence map, originally run in July 2018, were re-run on Wednesday 27 February 2018. These searches aimed to identify evidence to answer the following 2 questions:

1. Has a vaccination for parvovirus B19 been identified?
2. Have studies of interventions in pregnancy been found to prevent transmission of parvovirus to the fetus or reduce its effects in the baby?

SEARCH CARRIED OUT ON: 27 February 2019

SOURCES SEARCHED: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily 1946 to February 26, 2019, Embase 1996 to 2019 Week 08 and the Cochrane Library.

DATES OF SEARCH: July 2018 – February 2019

Searches were run from 2018 – 2019 and cross-referenced to the results of the July search using EndNote. Any reference picked up in the previous search were discarded so that only references since the previous search were included.

SEARCH RESULTS: July 2018-February 2019 (with result retrieved by previous search in July discarded)

	Question 1	Question 2
Medline	3	11
Embase	13	37
Cochrane Library	0	0
Total	16	48

Duplicates were removed from these results sets

13 unique results for question 1

40 unique results for question 2

After sifting the results for relevance to their respective questions, no relevant references were retrieved.

References

[i] Professor Catherine Peckham, Parvovirus B19 Infection in Pregnancy, A Brief Review of Literature, External review against programme appraisal criteria for the UK National Screening Committee, June 2014, Available at: https://legacyscreening.phe.org.uk/parvovirus

[ii] Lamont RF, Sobel JD, Vaisbuch E, Kusanovic JP, Mazaki-Tovi S, Kim SK, et al. Parvovirus B19 infection in human pregnancy. BJOG: An International Journal of Obstetrics & Gynaecology. 2011;118(2):175-86.