

Review of Evidence on Maternal Risks & Benefits Associated with Caesarian Birth

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Background

- History of Caesarian section
 - Derived from Caesar and the word caedere 'to cut'
 - First described as a procedure to remove a child from a dead mother
 - Children born by caesarian section were non-natus (not born)
 - Next used to allow for birth in women with physical deformities – dwarfism – preventing vaginal delivery
 - Maternal mortality at beginning of 19th Century was 65-75%

History of Caesarian technique

- 1926 – Rotten Row lying in hospital in Glasgow – the transverse incision
- Early 20th century – indication for C/S for placenta previa
- Pfannestiel advocated fascia be cut transversally for secure closure
- Drop in morbidity and mortality over the last century

Outline

- Review of literature on maternal risks both short and long term
- Review of literature on maternal benefits both short and long term
- Review of data from BCPHP report as it pertains to maternal risks/benefits
- Review of knowledge gaps

Issues for maternal risk/benefit

- Quality of data flawed
 - Retrospective reviews – apples and oranges!
 - Compare successful vaginal delivery to emergency C/S, to elective C/S or to both
 - Some include instrumented vaginal delivery
 - Some compare intended vaginal to intended C/S
 - Prospective studies – selective populations – sometimes representative, sometimes not
 - Moving target- changes in women's characteristics, changes in medical/surgical methods

Potential maternal risks to be reviewed

- Immediate surgical complications
 - Whole experience – how does the woman feel about her surgical birth
 - Bleeding (need for transfusion), infection, intraoperative trauma, thromboembolism
- Longer term complications
 - Impairment to fertility?
 - Future obstetrical complications – placenta previa, accreta
 - Need for future C/S and/or surgical complications in future pregnancy

Potential maternal benefits

- Life saving in situations of extreme malposition or placenta previa
- Prevention of maternal trauma in cases of true cephalopelvic disproportion and inability to safely deliver vaginally even with operative assistance
- Protection of the pelvic floor?
- Other?

Canadian data on maternal morbidity and mortality

(CMAJ 2007;176(4):455)

- 1991-2005
- Planned C/S (for breech) vs planned vaginal (spont vag + instrument vag + emerg c/s)
- Retrospective database review

Morbidity rates for selected causes

Type	Caesarian	Intended vaginal	OR
SAMM	27.3/1,000	9.0/1,000	3.1
Haemorrh + Hyst	0.3/1,000	0.1/1,000	2.1
Haemorrh + transf	0.2/1,000	0.7/1,000	0.4
Uterine rupt	0.2/1,000	0.3/1,000	0.5
Ob shock	0.1/1,000	0.2/1,000	0.4
Cardiac arrest	1.9/1,000	0.4/1,000	5.1
Death	0	0.02/1,000	

Morbidity rates for selected causes

Types	Caesarian	Intended vaginal	
Thrombo-embolism	0.6/1,000	0.3/1,000	2.2
Puerperal infection	6.0/1,000	2.1/1,000	3.0
Wound disrupt.	0.9/1,000	0.5/1,000	1.9
Wound hematoma	13.0/1,000	2.7/1,000	5.1

NIH review of C/S: March 2006: Moderate quality evidence

- Hemorrhage is more frequent with planned c/s compared with planned vaginal delivery + emerg c/s
- C/S requires a longer hospital stay – data does not include length of stay prior to birth

NIH review of C/S: March 2006

Data that favors planned c/s –weak evidence

- Stress urinary incontinence
 - Lower after elective c/s compared with vaginal delivery
 - increased with forceps and reduced by c/s
- Surgical and traumatic complications – lower in elective c/s vs emerg

NIH review of C/S: March 2006

Data that favors planned vaginal – weak evidence

- Infection – lower in vaginal but highest in planned vaginal that result in emerg c/s
- Anaesthetic complications – conflicting data
- Subsequent placenta previa – risk increases with number of prior c/s, with increasing age and parity
- Breast feeding – may be higher in vaginal deliveries – no significant difference

NIH review of C/S: March 2006

- Uterine rupture – higher incidence with attempted VBAC
- Hysterectomy – no difference with primary c/s but increased in repeated c/s
- Subsequent fertility – reduction post c/s - ?
Voluntary
- Anorectal function – reduced with elective c/s
- Pelvic organ prolapse – most related to parity

Meta analysis of available large studies: Semin Perinatology 2006

- Retrospective cohort – planned delivery route with vertex presentations
- Retrospective cohorts planned delivery incl breech c/s
- Prospective randomized planned delivery route – breech studies

Planned C/S vs planned vaginal

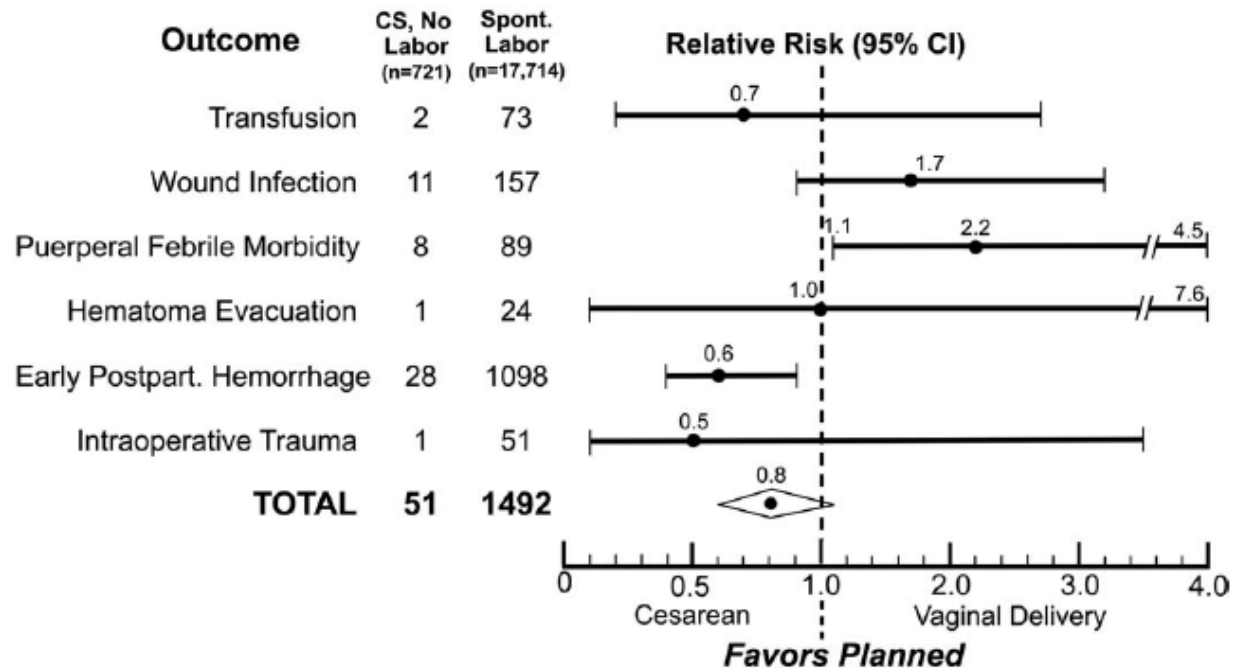


Figure 1 Retrospective cohort: planned delivery route (vertex).

Subanalysis of planned C/S vs vaginal delivery by actual delivery

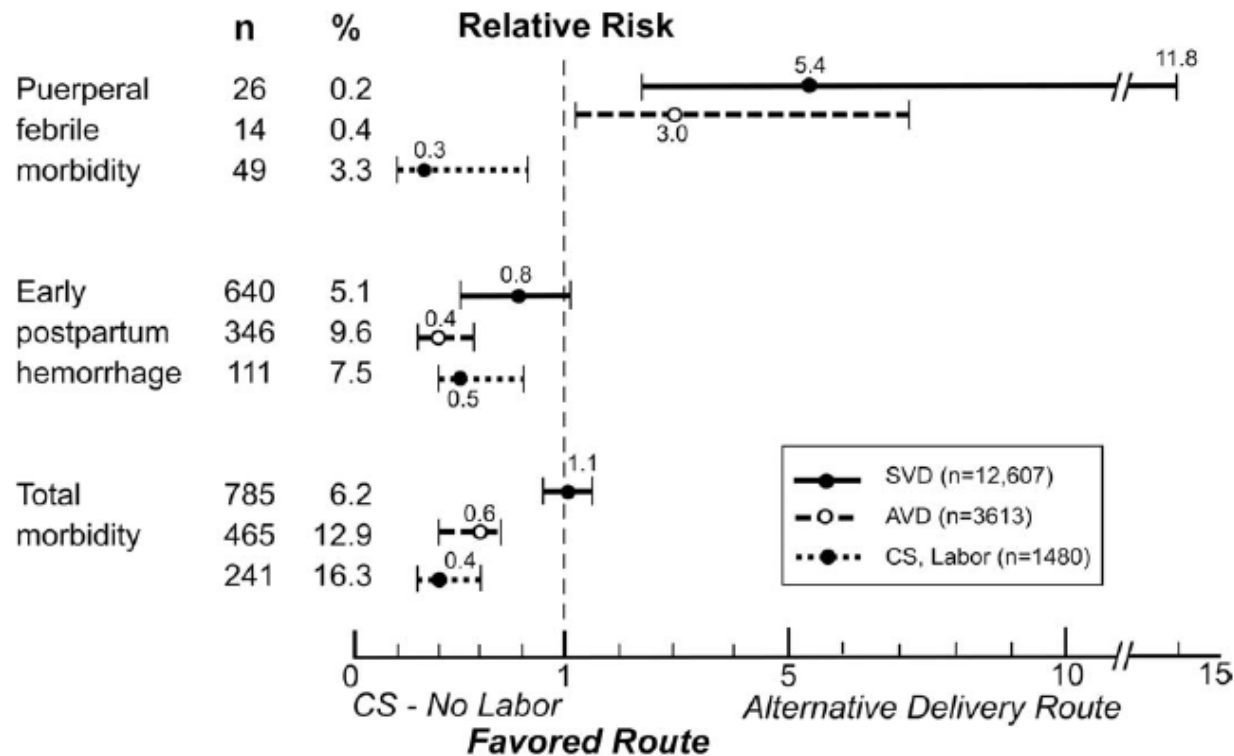


Figure 2 Retrospective cohort: planned delivery route (vertex: subanalysis).

Breech presentation – planned C/S vs planned vaginal

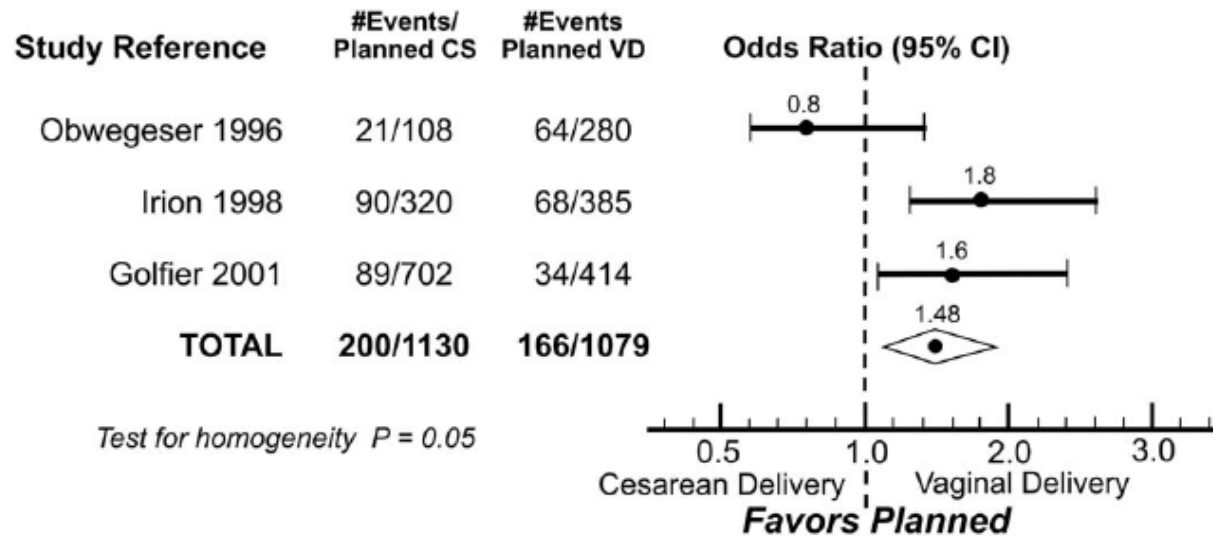
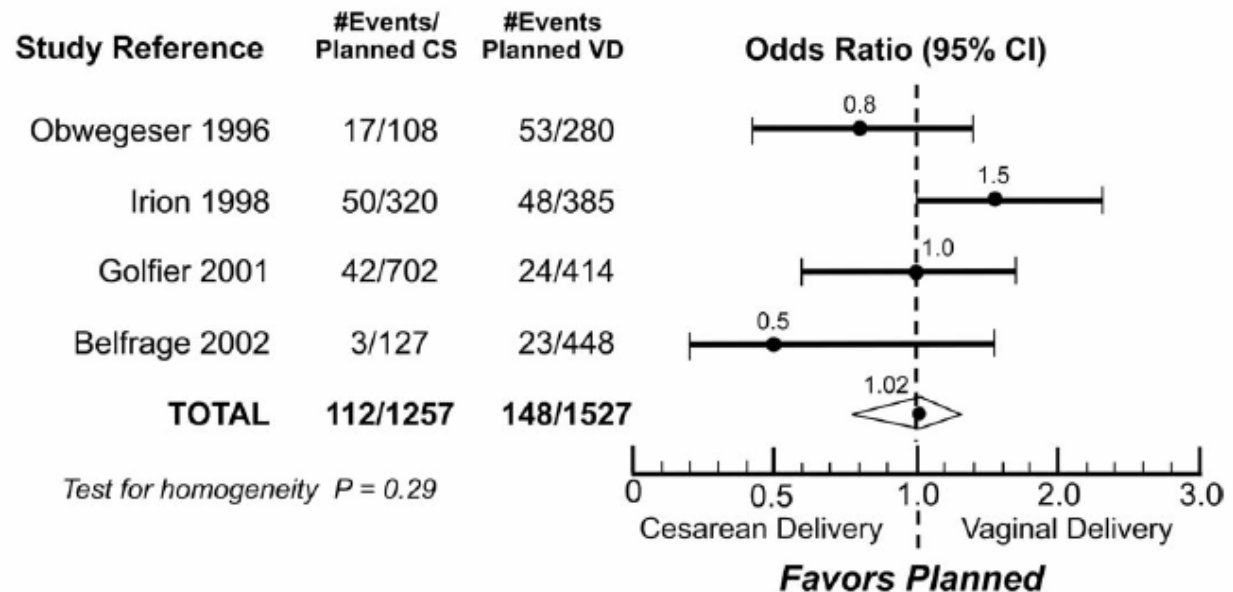


Figure 3 Retrospective cohort: planned delivery route (breech). Meta-analysis of maternal morbidity including cystitis (Random Effects Model).

Subanalysis: Breech presentation with planned C/S vs planned vaginal delivery

Figure 4 Retrospective cohort: planned delivery route (breech). Meta-analysis of maternal morbidity excluding cystitis (Fixed Effects Model).



Prospective studies of Breech presentation – planned C/S vs planned vaginal

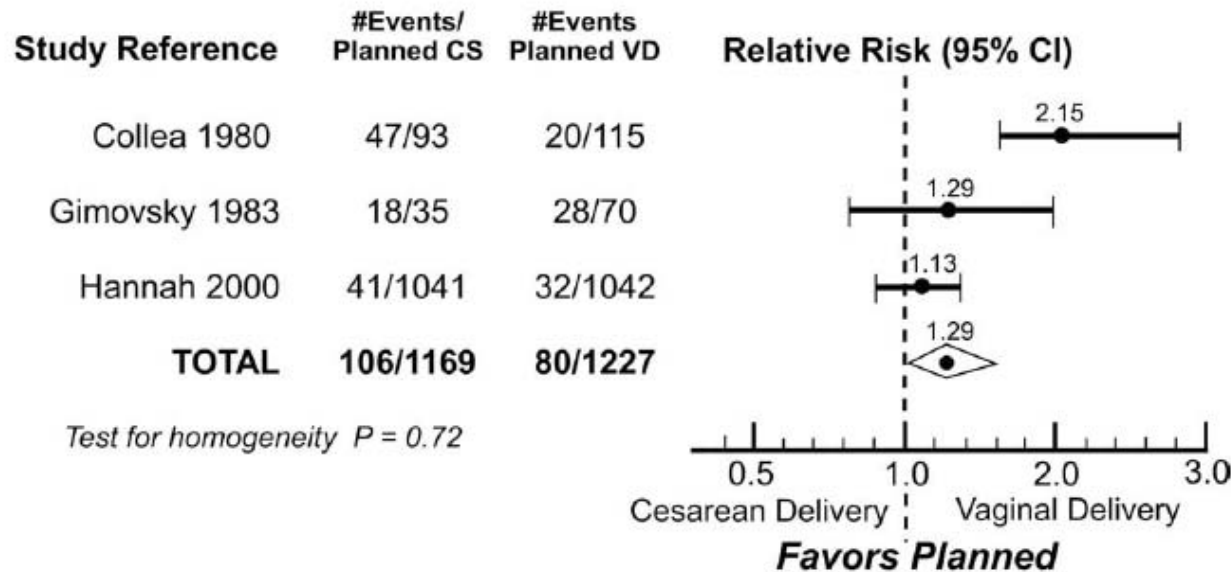


Figure 5 Prospective randomized: planned delivery route (breech). Meta-analysis of maternal morbidity (Fixed Effects Model).

Overall review of maternal morbidity by planned C/S vs planned vaginal delivery

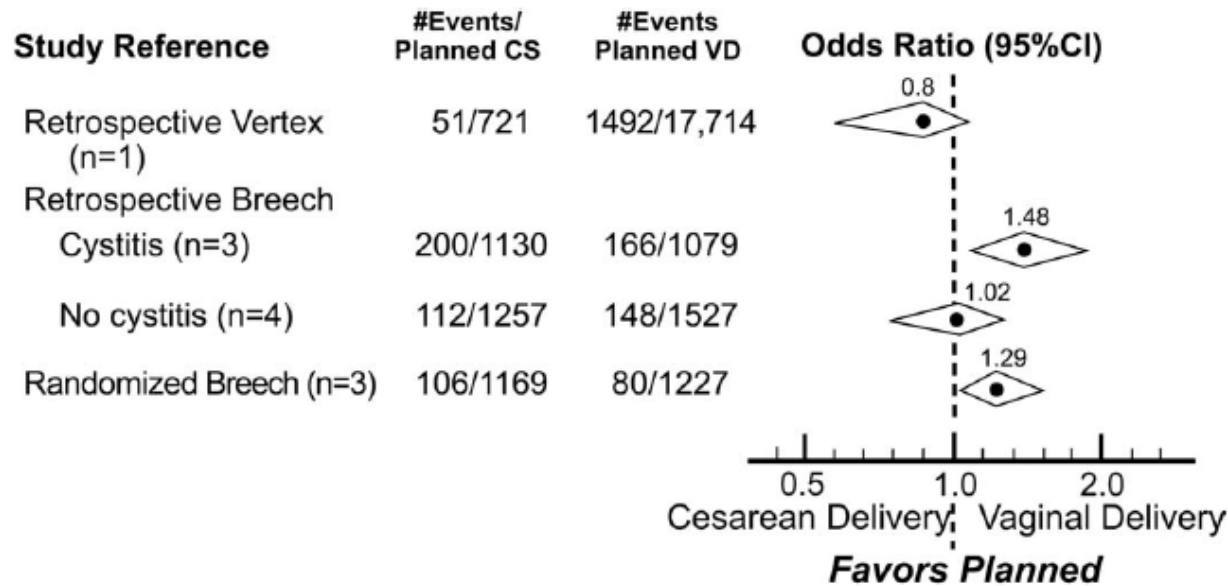


Figure 6 Maternal morbidity by planned delivery route: summary.

Summary

- Lowest maternal risk associated with an uncomplicated vaginal birth in a young woman of low parity without underlying medical complications
- Highest maternal risk is associated with an in labour caesarian section
- Higher quality data in large Canadian populations are required to determine drivers of maternal morbidity and modifiable factors
- Time for a prospective study of mode of delivery?