Evidence Update

Maternal Health Series

January 2005

In caesarean section, do antibiotics reduce complications caused by infections?

In both elective and emergency caesarean section, prophylactic antibiotics markedly reduce wound infection, fever, endometritis, and serious infectious morbidity or death.

Inclusion criteria

Studies:

Randomized and quasi-randomized trials comparing antibiotic prophylaxis to no antibiotics for caesarean section.

Participants:

Women undergoing elective and non-elective caesarean delivery. Rupture of membranes for more than six hours or the presence of labour were used to differentiate a non-elective caesarean delivery from an elective procedure.

Intervention:

Any prophylactic antibiotic regimen administered for caesarean delivery compared with placebo or no treatment.

Outcomes:

Serious complications caused by infections; fever; wound infection; endometritis; urinary tract infection.

Results

81 trials included (n = 11,957). In both elective and emergency caesarean section, antibiotic prophylaxis reduces:

- Wound infection (relative risk 0.41, 95% confidence interval 0.35 to 0.48).
- Fever (RR 0.45, 95% CI 0.39 to 0.52).
- Endometritis (RR 0.39, 95% Cl 0.34 to 0.43).
- Urinary tract infection (RR 0.54, 95% CI 0.46 to 0.64).
- Serious infectious morbidity or death (RR 0.42, 95% Cl 0.28 to 0.65).







Adapted from Smaill F, Hofmeyr GJ. Antibiotic prophylaxis for cesarean section. *The Cochrane Database of Systematic Reviews* 2002, Issue 3. Art. No.: CD000933. DOI: 10.1002/14651858.CD000933.

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study	Treatment	Control	RR (fixed)	RR (fixed)
r sub-category	n/N	n/N	95% Cl	95% CI
Elective cesarean delivery				
Dashow 1986	1/100	0/33		1.01 [0.04, 24.21]
Duff 1982	0/42	0/40		Not estimable
touzi 2000	0/121	0/109		Not estimable
ubtotal (95% Cl)	263	182		1.01 [0.04, 24.21]
otal events: 1 (Treatment), 0	(Control)			
est for heterogeneity: not ap est for overall effect: Z = 0.0	plicable 1 (P = 1 00)			
2 Non-elective cesarean deli	very			
onover 1984	0/68	2/56		0.17 [0.01, 3.37]
ashow 1986	2/183	0/44	a	1.22 [0.06, 25.03]
liott 1986	0/119	3/39 -		0.05 [0.00, 0.90]
bbs 1981	1/50	3/50		0.33 [0.04, 3.10]
ewis 1990	1/76	2/75		0.49 [0.05, 5.33]
oss 1984	0/57	1/58		0.34 [0.01, 8.15]
dver 1983	1/244	1/117	3 	0.48 [0.03, 7.60]
oung 1983	2/50	8/50		0.25 [0.06, 1.12]
ibtotal (95% Cl)	847	489	•	0.28 [0.13, 0.61]
ται events: 7 (Treatment), 2 st for heterogeneity: Chi² = st for overall effect: Ζ = 3.1	5 (Control) 2.86, df = 7 (P = 0.90), l ² = 0% 7 (P = 0.002)			
3 Both elective and non-elec	tive, or undefined cesarean de	livery	53.74	
ibi 1994	0/133	3/136		0.15 [0.01, 2.80]
ourgeois 1985	0/73	0/75		Not estimable
e Boer 1989	1/91	3/91		0.33 [0.04, 3.15]
ilon 1981	0/46	0/55	200	Not estimable
all 1979	0/46	4/49		0.12 [0.01, 2.14]
ibbs 1972	1/33	1/33		1.00 [0.07, 15.33]
bbs 1973	0/34	1/34		0.33 [0.01, 7.91]
ager 1983	0/43	1/47		0.36 [0.02, 8.70]
mail 1990	8/74	1/78		8.43 [1.08, 65.79]
	0/48	2/49		0.20 [0.01, 4.14]
reutner 1978		1/43	100 (m)	0.17 [0.01, 4.10]
reutner 1978 evin 1983	0/85			
ireutner 1978 evin 1983 fallaret 1990	0/85 0/136	1/130		0.32 [0.01, 7.75]
(reutner 1978 .evin 1983 fallaret 1990 filler 1968	0/85 0/136 0/150	1/130 3/150		0.32 [0.01, 7.75] 0.14 [0.01, 2.74]
(reutner 1978 evin 1983 fallaret 1990 fiiller 1968 adilla 1983	0/85 0/136 0/150 1/34	1/130 3/150 3/37		0.32 [0.01, 7.75] 0.14 [0.01, 2.74] 0.36 [0.04, 3.32]
(reutner 1978 evin 1983 tallaret 1990 tiller 1968 adilla 1983 helan 1979	0/85 0/136 0/150 1/34 1/61	1/130 3/150 3/37 1/61		0.32 [0.01, 7.75] 0.14 [0.01, 2.74] 0.36 [0.04, 3.32] 1.00 [0.06, 15.63]
(reutner 1978 evin 1983 fallaret 1990 fallaret 1990 radilla 1983 helan 1979 folk 1982	0/85 0/136 0/150 1/34 1/61 0/146	1/130 3/150 3/37 1/61 4/132		0.32 [0.01, 7.75] 0.14 [0.01, 2.74] 0.36 [0.04, 3.32] 1.00 [0.06, 15.63] 0.10 [0.01, 1.85]
(reutner 1978 (evin 1983 Mallaret 1990 Mallaret 1990 Malla 1983 Helan 1979 Helan 1979 Koex 1986	0/85 0/136 0/150 1/34 1/61 0/146 1/64	1/130 3/150 3/37 1/61 4/132 0/65		0.32 [0.01, 7.75] 0.14 [0.01, 2.74] 0.36 [0.04, 3.32] 1.00 [0.06, 15.63] 0.10 [0.01, 1.85] 3.05 [0.13, 73.41]
ireutner 1978 evin 1983 fallaret 1990 filler 1968 fadilla 1983 helan 1979 rolk 1982 toozx 1986 toozi 2000	0/85 0/136 0/150 1/34 1/61 0/146 1/64 0/100	1/130 3/150 3/37 1/61 4/132 0/65 4/111		$\begin{array}{c} 0.32 & [0.01, 7.78] \\ 0.14 & [0.01, 2.74] \\ 0.36 & [0.04, 3.32] \\ 1.00 & [0.06, 15.63] \\ 0.10 & [0.01, 1.85] \\ 3.05 & [0.13, 73.41] \\ 0.12 & [0.01, 2.26] \end{array}$
Kreutner 1978 .evin 1983 Mallaret 1990 Miller 1968 Padilla 1983 Phelan 1979 Polk 1982 Roex 1986 Rouzi 2000 Ciuly 1983	0/85 0/136 0/150 1/34 1/61 0/146 1/64 0/100 0/52	1/130 3/150 3/37 1/61 4/132 0/65 4/111 2/61		0.32 [0.01, 7.75] 0.14 [0.01, 2.74] 0.36 [0.04, 3.32] 1.00 [0.06, 15.63] 0.10 [0.01, 1.85] 3.05 [0.13, 73.41] 0.12 [0.01, 2.26] 0.23 [0.01, 4.77]
reutner 1978 evin 1983 Iallaret 1990 Illider 1968 adilla 1983 helan 1979 olk 1982 toex 1986 ouzi 2000 ully 1983 Vong 1978	0/85 0/136 0/150 1/34 1/61 0/146 1/64 0/100 0/52 1/48	1/130 3/150 3/37 1/61 4/132 0/65 4/111 2/61 0/45		0.32 [0.01, 7.78] 0.14 [0.01, 2.74] 0.36 [0.04, 3.32] 1.00 [0.06, 15.63] 0.10 [0.01, 1.85] 3.05 [0.13, 73.41] 0.12 [0.01, 2.26] 0.23 [0.01, 4.77] 2.82 [0.12, 67.40]
eutner 1978 svin 1983 allaret 1990 liller 1968 adilla 1963 selan 1979 selan 1979 sex 1986 seuzi 2000 ully 1983 ong 1978 btotal (95% CI)	0/85 0/136 0/150 1/34 1/61 0/146 1/64 0/100 0/52 1/48 1497	1/130 3/150 3/37 1/61 4/132 0/65 4/111 2/61 0/45 1482		0.32 [0.01, 7.75] 0.14 [0.01, 2.74] 0.36 [0.04, 3.32] 1.00 [0.06, 15.63] 0.10 [0.01, 1.85] 3.05 [0.13, 73.41] 0.12 [0.01, 2.26] 0.23 [0.01, 4.77] 2.82 [0.12, 67.40] 0.50 [0.30, 0.84]
Kreutner 1978 Levin 1983 Mallaret 1990 Miller 1968 Padilla 1983 Phelan 1979 Polik 1982 Roez 1986 Rouzi 2000 Tully 1983 /Vong 1978 Jubtotal (95% CI) otal events: 14 (Treatment), 'est for heterogeneity: Chi ² = est for overall effect: Z = 2.6	0/85 0/136 0/150 1/34 1/61 0/146 1/64 0/100 0/52 1/48 1497 35 (Control) 15.91, df = 17 (P = 0.53), P = 0 1 (P = 0.009)	1/130 3/150 3/37 1/61 4/132 0/65 4/111 2/61 0/45 1482		0.32 [0.01, 7.78] 0.14 [0.01, 2.74] 0.36 [0.04, 3.32] 1.00 [0.06, 15.63] 0.10 [0.01, 1.85] 3.05 [0.13, 73.41] 0.12 [0.01, 2.26] 0.23 [0.01, 4.77] 2.82 [0.12, 67.40] 0.50 [0.30, 0.84]
<pre>Kreutner 1978 _evin 1983 wallaret 1990 wallaret 1990 wallaret 1990 wallaret 1990 vallaret 1990 vallaret 1990 vallaret 1990 vallaret 1990 vallaret 1980 vong 1978 uibtotal (95% CI) otal (95% CI) </pre>	0/85 0/136 0/136 1/34 1/61 0/146 1/64 0/100 0/52 1/48 1497 35 (Control) 15.91, df = 17 (P = 0.53), P = 0 1 (P = 0.009) 2607	1/130 3/150 3/37 1/61 4/132 0/65 4/111 2/61 0/45 1482 %		0.32 [0.01, 7.78] 0.14 [0.01, 2.74] 0.36 [0.04, 3.32] 1.00 [0.06, 15.63] 0.10 [0.01, 1.85] 3.05 [0.13, 73.41] 0.12 [0.01, 2.26] 0.23 [0.12, 67.40] 0.50 [0.30, 0.84] 0.42 [0.28, 0.65]
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Authors' conclusions

Implications for practice:

Prophylactic antibiotics have important health gains when used in both elective and non-elective caesarean section. Evaluation of specific regimens are contained in a separate review.

Implications for research:

Further placebo-controlled trials of the effectiveness of antibiotics with caesarean section are not ethically justified. Research should concentrate on methods to implement effective policies of routine prophylaxis for women undergoing caesarean section. Data is needed on the safety of the intervention for the mother and infant. Future research should look at interventions to reduce further the incidence of infection from that achieved with the current standard approach to antibiotic prophylaxis.