

Evidence-Based Medicine Journal Club

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Patient

- Ex-27 week male born via NSVD to mom secondary to PROM
- Developed grade IV intraventricular hemorrhage (IVH)
- What can be done to reduce the risk of IVH?

Article

- **Delayed Cord Clamping in Very Preterm Infants Reduces the Incidence of Intraventricular Hemorrhage and Late-Onset Sepsis: A Randomized, Controlled Trial**
- Authors: Judith S. Mercer, Betty R. Vohr, Margaret M. McGrath, James F. Padbury, Michael Wallach, and William Oh.
- PEDIATRICS Vol. 117 No. 4 April 2006, pp. 1235-1242

Background

- Current obstetric practice is immediate cord clamping (ICC)
- Delayed cord clamping (DCC) increases transfer of blood from placenta to infant
- 9 randomized, controlled trials have documented the safety and efficacy of DCC
- DCC has numerous benefits
- Previous studies had limitations

Answerable Clinical Question

- P: In infants < 32 weeks gestation
- I: Does DCC
- C: As compared to ICC
- O: Decrease the risk of IVH, late-onset sepsis, BPD, and ROP

Analysis of the study: Are the results likely to be valid?

- Were the groups similar at the start of the trial?
- Aside for the experimental intervention, were the groups treated equally?
- Was the assignment of patients to treatment randomized?

Analysis of the study: Are the results likely to be valid?

- Were patients and clinicians kept blind to treatment?
- Were patients analyzed in the groups to which they were randomized?
- Were all patients who entered the trial properly accounted for and attributed at its conclusion?

Question: Were the groups similar at the start of the trial?

- Infants in both groups were between 24 and 31.6 weeks gestation
- Same exclusion criteria for both groups
- Similar maternal and neonatal demographics

Answer: Yes

Question: Aside from the experimental intervention, were the groups treated equally?

- Warming mattress for both sets of infants
- Similar number of patients in each group received low-dose indomethacin for IVH prophylaxis

Answer: Yes

Question: Was the assignment of patients to treatment randomized?

- Two sets of cards labeled for randomization were enclosed in sequenced, opaque envelopes containing group assignment
- Research assistants screened potentially eligible women, enrolled them, and attended the births
- Research assistants opened the next randomization card, informed the staff of the group assignment, reviewed the protocol with the attending, attended the birth and timed the cord clamping

Answer: Yes

Question: Were patients and clinicians kept "blind" to treatment?

- The nurse at the delivery and OB were aware of the intervention
- The infant's grouping in the medical charts was withheld

Answer: Yes and No

Questions: Were all patients who entered the trial properly accounted for and attributed?

- 296 women admitted in PTL; 54 were missed; 57 excluded
- 185 approached for enrollment; 34 refused; 79 not randomized
- 72 randomly assigned; 36 to each group
- 7 protocol violations: **All infants remained in the assigned groups for analysis**
- 3 deaths in ICC group; all were analyzed if the condition diagnosed before death
- No deaths in DCC group; all were analyzed

Answer: Yes

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- Aside for the experimental intervention, were the groups treated equally? Yes
- Was the assignment of patients to treatment randomized? Yes

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RESULTS

TABLE 3 Neonatal Morbidities, Blood Loss, and Transfusions

	ICC (n = 36), n (%)	DCC (n = 36), n (%)
BPD	9 (25)	8 (22)
Discharge on O ₂ ^a	4 (12)	5 (14)
SNEC	20 (56)	14 (39)
NEC, Bell's ¹⁹ stage		
No sign	25 (69)	27 (75)
1a	7	6
1b	0	2
2a	1	1
3b	2	0
Perforation	1	0
Blood loss: week 1, mL	11.4 ± 5.8	11.3 ± 5.7
Infants transfused	22 (61)	18 (50)
Transfusions	2.47 ± 3.7	1.94 ± 3.1
Total amount transfused, mL	33 ± 45	27 ± 42
ROP (all) ^b	13 (40)	10 (28)
Deaths	3 (8)	0

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TABLE 4 IVH and Late Onset Sepsis in Study Infants

	ICC (<i>n</i> = 36), <i>n</i> (%)	DCC (<i>n</i> = 36), <i>n</i> (%)	<i>P</i>	Odds Ratio	95% CI
IVH					
All IVH	13 (36)	5 (14)	.03	3.5	1.1–11
Grade 1	4 (11)	3 (8)			
Grade 2	8 (22)	2 (6)			
Grade 4	1 (3)	0 (0)			
Late Onset Sepsis	8 (22)	1 (3)	.03	.1	0.01–0.84

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TABLE 5 Gender Differences in IVH, LOS, and NEC Among Infants With ICC and DCC

	ICC		DCC	
	Boys (<i>n</i> = 19), <i>n</i> (%)	Girls (<i>n</i> = 17), <i>n</i> (%)	Boys (<i>n</i> = 23), <i>n</i> (%)	Girls (<i>n</i> = 13), <i>n</i> (%)
IVH	8 (42) ^a	5 (29)	2 (9)	3 (23)
Sepsis	6 (32) ^a	2 (12)	0 (0)	1 (8)
NEC	3 (16) ^a	1 (6)	0 (0)	2 (15)

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IVH	8 (42) ^a	5 (29)	2 (9)	3 (23)
Sepsis	6 (32) ^a	2 (12)	0 (0)	1 (8)
NEC	3 (16) ^a	1 (6)	0 (0)	2 (15)

Analysis of this study: Are the results clinically significant?

- How large was the treatment effect?
- How precise was the estimate of the treatment effect?

Question: How large was the treatment effect?

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Question: How large was the treatment effect?

	IVH	No IVH	Total
DCC	5	31	36
ICC	13	23	36
Total	18	54	72

- o Risk w/o DCC: 13/36=36%
- o Risk w/DCC: 5/36=14%
- o Absolute risk reduction:
 - 0.36-0.14=0.22
- o Relative risk: 0.14/0.36=0.38
- o Relative risk reduction: (1-0.38) x 100=62%

Answer: 62% reduction in IVH with DCC

- Analysis of this study: Will the results help me in caring for my patients?
- o Can the results be applied to my patient care?
 - o Were all clinically important outcomes considered?
 - o Are the likely treatment benefits worth the potential harm and costs?

- Question: Can the result be applied to my patient care?
- o Met the inclusion criteria
 - o Did not meet exclusion criteria

- Question: Can the result be applied to my patient care? YES
- o Met the inclusion criteria
 - o Did not meet exclusion criteria

Question: Are the likely treatment benefits worth the potential harm and costs?

- No deleterious effect on other neonatal morbidities
- Reduced risk of IVH and LOS
- No additional monetary cost
- Small sample size
- Broad 95% CI

Question: Were all clinically important outcomes considered?

Table 3: Neonatal Morbidities, Blood Loss, and Transfusions

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Question: Would I change my practice based on this study?

THANK YOU!

