LEIDS UNIVERSITAIR MEDISCH CENTRUM

Laparotomy after childbirth

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Research goals

1. Identify the first nationwide incidence rate for laparotomy after childbirth

2. Compare incidence rates with nationwide reference data

3. Calculate relative risk for laparotomy after vaginal birth compared to caesarean delivery

Methods: LEMMoN-study

- Two-year nationwide prospective cohort study to assess SAMM during pregnancy, delivery and puerperium in the Netherlands.
- Population: pregnant women from all 98 Dutch maternity units in the period 2004-2006.
- Inclusion criteria for SAMM were categorized into five groups

Inclusion criteria

Group 1: ICU admission

- Admission to ICU or coronary care unit, other than for standard postoperative recovery

Group 2: Uterine rupture

- Clinical symptoms (pain, fetal distress, acute loss of contractions and haemorrhage) that led to an emergency caesarean section, at which the presumed diagnosis of uterine rupture was confirmed
- Peripartum hysterectomy or laparotomy for uterine rupture

Group 3: Eclampsia/HELLP syndrome

- Eclampsia
- HELLP syndrome only when accompanied by liver haematoma or rupture

Group 4: MOH

- Transfusion need of ≥ 4 units of packed cells
- Embolisation or hysterectomy for MOH

Group 5: Miscellaneous

- Other cases of severe maternal morbidity to the opinion of the treating obstetrician, not to be included in group 1–4

Methods

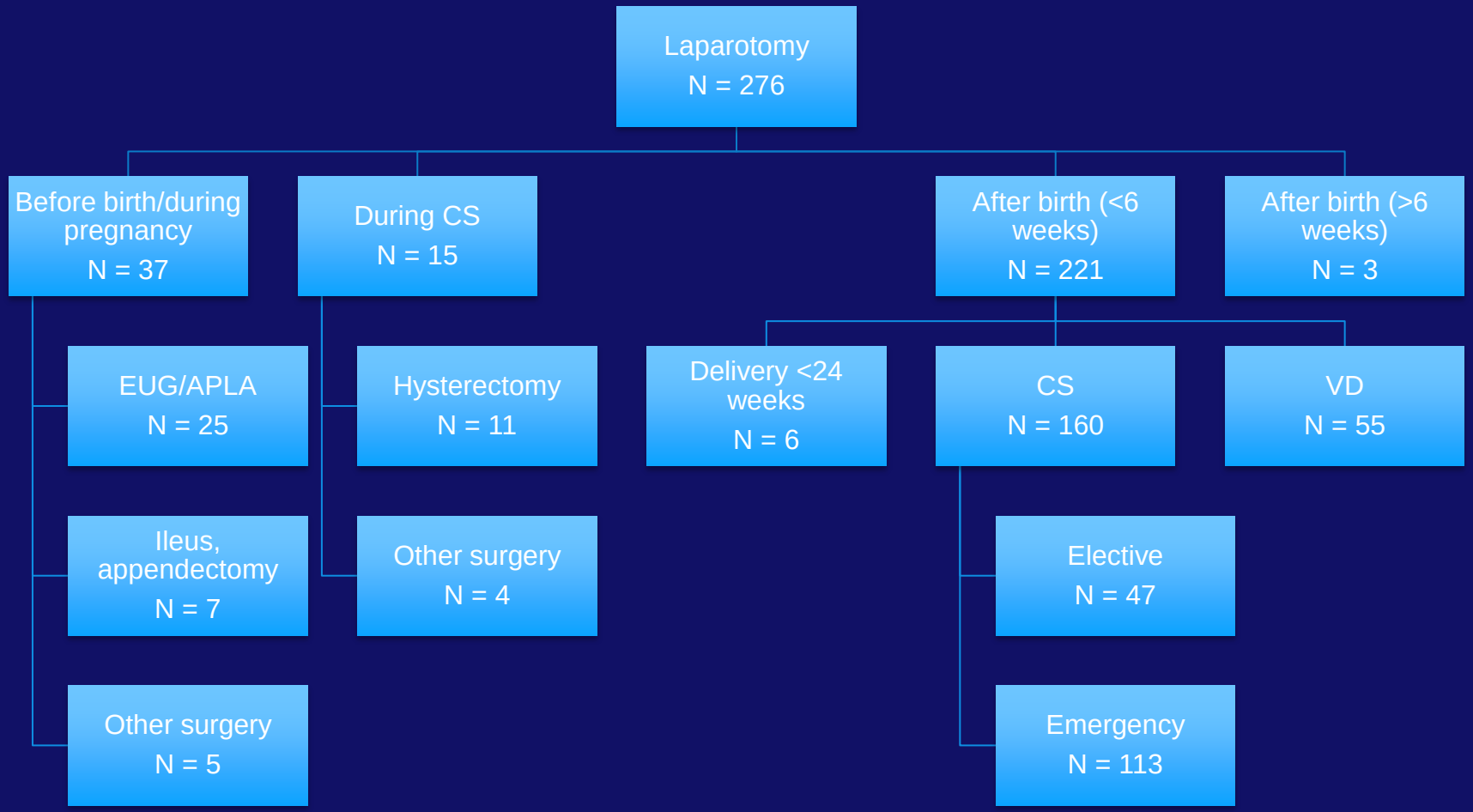
- Inclusion: women that endured one or more laparotomies during pregnancy, childbirth and puerperium

- Risk-analysis: laparotomy after birth (<6 weeks) in relation to mode of delivery using total number of deliveries as reference*

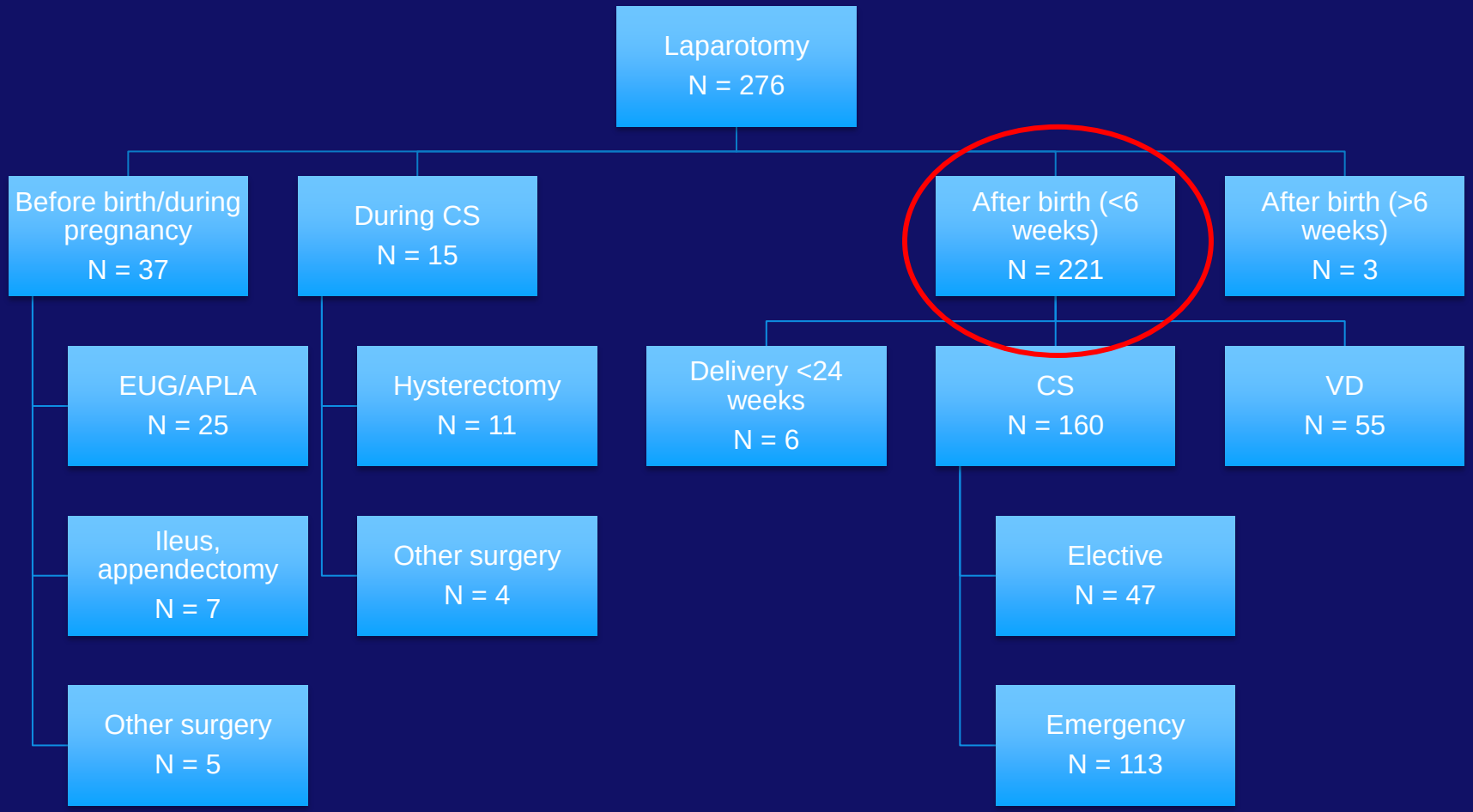
- Primary : incidence rates and relative risks
- Secondary: patient/delivery/management information was compared

*Dutch Perinatal Registry (PRN) = national registration system for monitoring obstetric health care, data corrected for study period

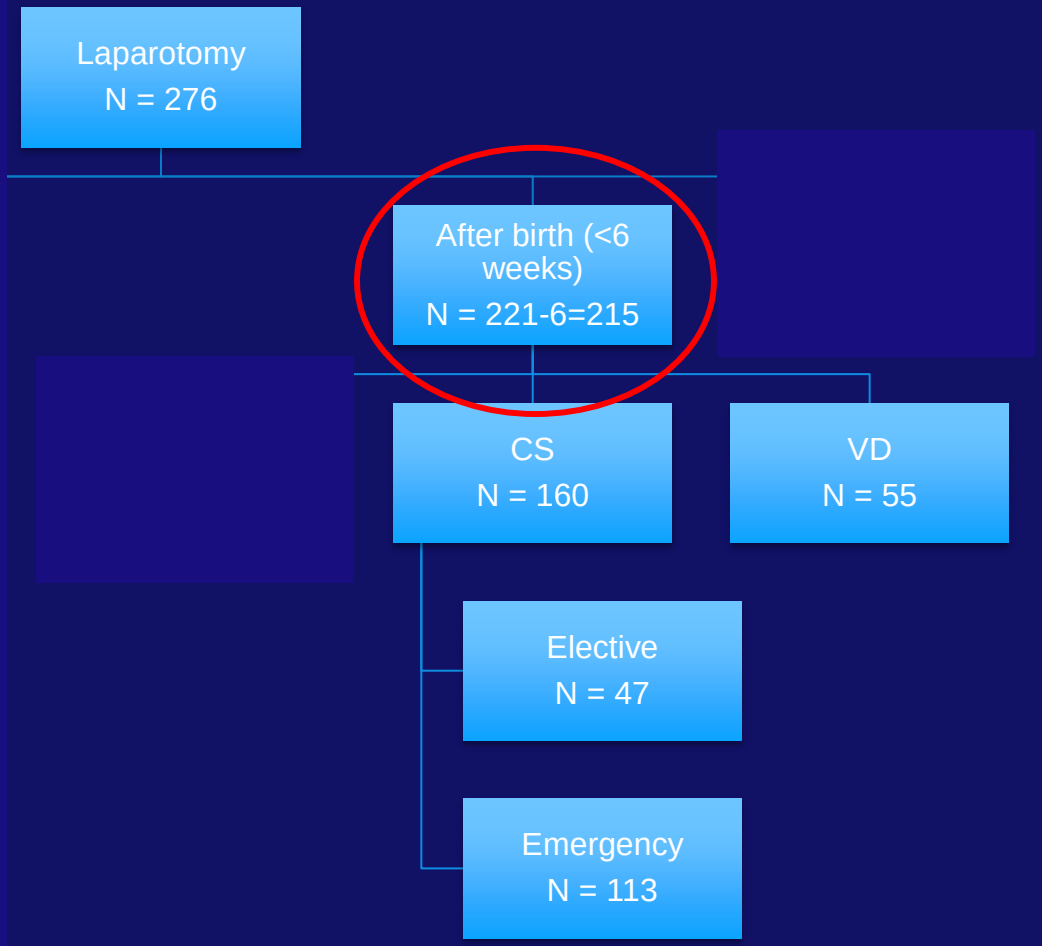
Results - overview



Results - overview



Focus: cases used for risk analysis



Relative risks

Dutch Perinatal Registry LEMMoN-study

Table 1. Incidences of laparotomy after birth

		Deliveries	Laparotomy	Incidence*	RR (95% CI)
Total		355 841	215	6.0	
VD		302 689	55	1.8	Reference
CS		53 152	160	30.1	16.7 (12.2-22.6)
	Planned	24 580	47	19.1	10.5 (7.1-15.6)
	Emergency	28 572	113	39.5	21.8 (15.8-30.2)

CS=Caesarean section, VD=Vaginal delivery, RR=Relative risk. Data is presented as number (%). *per 10 000 deliveries

Secondary: detailed delivery information

Table 3. Detailed information of performed laparotomies

Total		VD N=55	CS N=160	P	Elective N=47	Emergency N-113	P
Indication 1st lap.	Intra-abd. bleeding	6 (10.9)	93 (58.1)	**<0.001**	28 (59.6)	65 (57.5)	0.777
	sPPH	34 (61.8)	49 (30.6)		13 (27.7)	36 (31.9)	
	Suspected UR	12 (21.8)	1 (0.6)		0 (0.0)	1 (0.9)	
	Sepsis*	4 (7.2)	7 (4.4)		1 (2.1)	6 (5.3)	
	Hematoma	0 (0.0)	4 (2.5)		1 (2.1)	3 (2.7)	
	Other	9 (16.4)	11 (7.5)		5 (10.6)	6 (5.3)	
	Unknown	0 (0.0)	1 (0.6)		0 (0.0)	1 (0.9)	
Moment	<24h	46 (83.6)	101 (63.1)	**<0.05**	30 (63.8)	71 (62.8)	**<0.05**
	2-7d	5 (9.1)	43 (26.9)		13 (27.7)	30 (26.5)	
	>7d	4 (7.3)	12 (7.5)		1 (2.1)	11 (9.7)	
	Unknown	0 (0.0)	4 (2.9)		3 (6.4)	1 (0.9)	
Intervention 1st lap.	Abdominal wall	0 (0.0)	13 (8.1)	**<0.001**	3 (6.4)	10 (8.9)	0.591
	Intra-ab	3.6)	40 (25.0)		12 (25.5)	28 (24.8)	
	CS		32 (20.0)		10 (21.3)	22 (19.5)	
	Li		11 (6.9)		3 (6.4)	8 (7.1)	
	I		32 (20.0)		11 (23.4)	21 (18.6)	
			8 (5.0)		1 (2.1)	7 (6.2)	
	D		9 (5.6)		2 (4.3)	7 (6.2)	
			19 (11.9)		3 (6.4)	16 (14.2)	
	Other	.2)	24 (15.0)		6 (12.8)	18 (15.9)	
	Unknown	0 (0.0)	6 (3.8)		3 (6.4)	3 (2.7)	
Number	1	43 (78.2)	129 (80.6)	0.26	41 (87.2)	88 (77.9)	0.44
	≥2	10 (18.2)	30 (18.8)		6 (12.8)	24 (21.2)	
	Unknown	2 (3.6)	1 (0.6)		0 (0.0)	1 (0.9)	
SAMM	Before birth	3 (5.5)	11 (6.9)	0.52	1 (2.1)	10 (8.9)	0.275
	Unknown	2 (3.6)	1 (0.6)		0 (0.0)	1 (0.9)	
Mortality		3 (5.5)	0 (0.0)	**<0.05**			

- Indication
- Moment
- Intervention during 1st
- Number
- SAMM before/after

Large unique detailed dataset.

Focus on VD vs. CS

Indications for performing laparotomy

Total		VD N=55	CS N=160	P	Elective N=47	Emergency N-113	P
Indication 1st lap.	Intra-abd. bleeding	6 (10.9)	93 (58.1)	<0.001	28 (59.6)	65 (57.5)	0.777
	sPPH	34 (61.8)	49 (30.6)		13 (27.7)	36 (31.9)	
	Suspected UR	12 (21.8)	1 (0.6)		0 (0.0)	1 (0.9)	
	Sepsis*	4 (7.2)	7 (4.4)		1 (2.1)	6 (5.3)	
	Hematoma	0 (0.0)	4 (2.5)		1 (2.1)	3 (2.7)	
	Other	9 (16.4)	11 (7.5)		5 (10.6)	6 (5.3)	
	Unknown	0 (0.0)	1 (0.6)		0 (0.0)	1 (0.9)	

Total:

Intra-abdominal bleeding: 99 women (46.0%) → mostly CS

Severe PPH: 83 women (38.6%) → mostly VD

Moment of laparotomy

		VD	CS				
Moment	<24h	46 (83.6)	101 (63.1)	**<0.05**	30 (63.8)	71 (62.8)	**<0.05**
	2-7d	5 (9.1)	43 (26.9)		13 (27.7)	30 (26.5)	
	>7d	4 (7.3)	12 (7.5)		1 (2.1)	11 (9.7)	
	Unknown	0 (0.0)	4 (2.9)		3 (6.4)	1 (0.9)	

Total of 147 (68.4%) laparotomy performed <24h after birth

CS → 26.9% performed after 2-7d → more likely to expect relaparotomy (bleeding) longer after CS

Intervention during first laparotomy

Intervention 1st lap.	Abdominal wall	0 (0.0)	13 (8.1)	**<0.001**	3 (6.4)	10 (8.9)	0.591
	Intra-abdominal	13 (23.6)	40 (25.0)		12 (25.5)	28 (24.8)	
	CS scar	2 (3.6)	32 (20.0)		10 (21.3)	22 (19.5)	
	Ligation	6 (10.9)	11 (6.9)		3 (6.4)	8 (7.1)	
	Hysterectomy	31 (56.4)	32 (20.0)		11 (23.4)	21 (18.6)	
	B-lynch procedure	1 (1.8)	8 (5.0)		1 (2.1)	7 (6.2)	
	Drainage	3 (5.5)	9 (5.6)		2 (4.3)	7 (6.2)	
	Negative	2 (3.6)	19 (11.9)		3 (6.4)	16 (14.2)	
	Other	10 (18.2)	24 (15.0)		6 (12.8)	18 (15.9)	
	Unknown	0 (0.0)	6 (3.8)		3 (6.4)	3 (2.7)	

Hysterectomy most frequently performed intervention (63 women, 29.3%)

…and 21 laparotomies with ‘negative’ intervention → only exploration

More than one laparotomy

Number	1	43 (78.2)	129 (80.6)	0.26	41 (87.2)	88 (77.9)	0.44
	≥2	10 (18.2)	30 (18.8)		6 (12.8)	24 (21.2)	
	Unknown	2 (3.6)	1 (0.6)		0 (0.0)	1 (0.9)	

More than 1 laparotomy: 40 (18.6%) women, including:

- 21 (52.5%) due (persisting) intra-abdominal bleeding
- 5 (12.5%) resulted in hysterectomy after all

Key messages

Study value:

- Large, unique population (largest other study found n=80)
- National incidence rates – relative risks

Conclusions

Laparotomy after birth is performed mostly due to severe bleeding, <24 hours after birth and results often in hysterectomy

Important: risk of laparotomy was >16 times (!) higher after CS compared to VD

Discussion

- Large proportion of women with previous CS in analysed population (34.0%) to the Dutch population (6.0%).
- Meaning: every CS has its cost.

- International example CS rates:

Netherlands → 11% to 16% (1999-2012)

US → 32%

Italy → 36%

Brazil → 50%

China → 52% (and 40% performed without medical indication!!)

Message for Italy

- Extremely high CS-rate
- Study from Italy in press:

  association of caesarean section rate and obstetric culture

  where hospitals have pro-active policy to stimulate

  instrumental vaginal delivery and

  trial of labour after previous CS

  those hospitals have a significantly lower CS-rate

Laparotomy after childbirth in Italy?

incidence of laparotomy after childbirth will thus be by inference

lower in hospitals with pro-active **IVD** and **VBAC** policies

Thank you for your attention!

Jos van Roosmalen

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