### **OBJECTIVE**

- Many studies report on limited adverse events of transvaginal cervical cerclage, but are not powered to draw conclusions about its safety.
- To estimate the risks and obtain an adequately informed consent is impossible.
- We conducted a systematic review with pooled risk analyses of perioperative complications and compare characteristics on the basis of indication for cerclage in singleton pregnancies.

Α

#### DATA SOURCES

Ovid MEDLINE, Ovid Embase, Web of Science, the Cochrane Central Register of Controlled Trials (CENTRAL), ClinicalTrials.gov and the World Health Organization International Clinical Trial Registry Platform

### **STUDY ELIGLIBILITY CRITERIA**

- RCTs and both retrospective and prospective observational cohort studies
- Reporting about complications in historyindicated cerclage (HIC), ultrasound-indicated cerclage (UIC), or physical examinationindicated cerclage (PEIC)
- Inclusion if they contained original data on the occurrence of adverse events during surgery or within 24 hours after surgery.

# RESULTS

- 2328 potential studies; 3 RCTs, 3 prospective, and 38 retrospective cohort studies were included in the final analysis.
- Total of 4511 women with singleton: 1561 (34.6%) underwent HIC, 1348 (29.9%) UIC, and 1549 (33.3%) PEIC.
- Most perioperative complications occurred in PEIC, especially hemorrhage (2.3%; 95% CI, 0.0-7.6) and preterm premature rupture of membranes PPROM(2.5%; 95% CI, 0.91-4.5).
- The fewest complications occurred in HIC, varying from 0.0% of PPROM (95% CI, 0.0-1.7) to 0.9% of hemorrhage (95% CI, 0.0-7.9).

# DISCUSSION

- First systematic overview published
- Considerable heterogeneity among the definitions used for the different indications
- Underreporting of complications

# Perioperative complications of a transvaginal cervical cerclage in singleton pregnancies: a systematic review and meta-analysis<sup>1</sup>



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A History-Indicat	ed Cercl	age				B Ultrasound-In		C Physical Examination-Indicated Cerclage										
						Study	Casas	Total	Proportion	95% CI		Study	Cases	Total	Proportion	95% CI		
Study	Cases	Total	Proportion	95% CI		study	Cases	Iotal	Proportion	95% CI		Kuruma 2021	13	145	8.97	[4.86; 14.84]		
						Drassinower 2019	6	426	1.41	[0.52; 3.04]	· 🛖	Ventolini 2009	1	56	1.79	[0.05; 9.55]	-	
Wei 2018	0	184	0.00	[0.00; 1.98]		Owen 2009 \$	1	153	0.65	[0.02; 3.59]		Wei 2018 Daskalakis 2006	0	30 29	0.00	[0.00; 11.57]		
Kuruma 2021	3	38	7.89	[1.66; 21.38]	-	Wei 2018	0	114	0.00	[0.00; 3.18]		10-11 (0) (0) (0)	2012	20				
Davis 2000	0	24	0.00	[0.00; 14.25]	_	Kuruma 2021	6	96	6.25	[2.33; 13.11]		Random effects mo Prediction interval	dei		2.29	[0.00; 7.58] [0.00; 36.26]	0	
												Heterogeneity: / <sup>2</sup> = 68%,	$x^2 = 0.0084, \ \chi_3^2 = 9.0084$	34 (p = 0.	.03)			1 1
Random effects model			0.92	[0.00; 7.91]		Random effects mode	4		1.35	[0.01; 4.07]	-						0 10 20 Hemorrha	30 40 5 age (%)
Prediction interval				[0.00; 100.00] -		Prediction interval				[0.00; 21.81]		Study Cases	Total Proport	ion	95% CI			
Heteropeneity $l^2 = 78\%$ , $r^2 = 0.0166$ , $v_r^2 = 9.09$ ( $p = 0.01$ )					Heterogeneity: $I^2 = 71\%$ , $\tau^2 =$	= 0.0052, $\chi_3^2$ =	10.49 (p =	0.01)		0 5 10 15 20 25	ciaci, caste	iou. inspen						
				0	20 40 60 80 100						Hemorrhage (%)	Zhu 2015 2	158 1	.27 [0	0.15; 4.5]			
					Hemorrhage (%)						and the second sec				0	10 20 30	40 50	
Study	Cases	Total	Proportion	95% CI		Study	Cases	Total	Proportion	95% CI					0	Cervical Trauma		
																	1-7	
Giraldo Isaz 2013	2	237	0.84	[0.1; 3.01]		Drassinower 2019	7	426	1.64	[0.66; 3.36]	-	Study	Cases T	otal F	Proportion	95% CI		
Davis 2000	0	24	0.00	[0.0; 14.25]		Giraldo Isaz 2013	0	207	0.00	[0.00; 1.77]	-	Kuruma 2021 Schneider 2019		145 105	3.45	[1.13; 7.86]	-	
												Arioldi 2009	0	98	0.00	[0.00; 3.69]		
Random effects model			0.22	[0.0; 1.65]		Random effects mode		•	0.59	[0.00; 3.14]		Kawamura 2019 Son 2015		94 91	4.26	[1.17; 10.54]	-	
Heterogeneity: $I^2 = 0\%$ , $\tau^2 = 0$	$\gamma_1^2 = 0.00 \ (p$	= 0.99)				Heterogeneity: $l^2 = 81\%$ , $\tau^2$	$= 0.0039, \chi_1^2 =$	5.38 (p = 0	.02)		0 5 10 15 20 25	Terkildsen 2003 Fuchs 2012	8	89	8.99	[3.96; 16.95]	-	
				0	5 10 15 20 25						Cervical Trauma (%)	Swanson 2018	2	85 60			_	
					Cervical Trauma (%)	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.						Ventolini 2009 Wong 1993	1 8	56 51	1.79	[0.05; 9.55] [7.02; 28.59]		
Study	Cases	Total	Proportion	95% CI		Study	Cases	Total	Proportion	95% CI		Basburg 2020	0	47	0.00	[0.00; 7.55]	-	
												Abo-Yaquob 2011 Karakus 2021	2 6	43 38		[0.57; 15.81] - [6.02; 31.25]		
Korb 2017	2	205	0.98	[0.12; 3.48]	-	Drassinower 2019	1	426	0.23	[0.01; 1.30]	-	Curti 2012 Cakiroglu 2016		37 30		[0.07; 14.16]		
Wei 2018	0	184	0.00	[0.00; 1.98]		Owen 2009 \$	1		0.65	[0.02; 3.59]		Wei 2018	0	30	0.00	[0.00; 11.57] 🔳		
Kuruma 2021	0	38	0.00	[0.00; 9.25]		To 2004	1	122	0.82	[0.02; 4.48]		Daskalakis 2006 Brown 2019		29 20		[0.00; 11.94] 📕 [0.00; 16.84] 📕		
Davis 2000	0	24	0.00	[0.00; 14.25]		Wei 2018	0	114	0.00	[0.00; 3.18]		Turkyilmaz 2020	1	20	5.00	[0.13; 24.87] -		
Bartolo 2017	1	14	7.14	[0.18; 33.87]	<b>→</b>	Skupsi 2013	2	109	1.83	[0.22; 6.47]		Cardosi 1998 Hordnes 1996	1	16	6.25	[0.14; 27.29] - [0.16; 30.23] -	-	
						Kuruma 2021	0	96	0.00	[0.00; 3.77]		Aoki 2013 Barth 1990	1 2	15 13		[0.17; 31.95] - [1.92; 45.45]	• • •	
Random effects model			0.00	[0.00; 0.87] ▷		Dandam effects mod			0.00	10.04.0.041	0	Locatelli 1999	ō	8		[0.00; 36.94]		-
Prediction interval				[0.00; 3.30]		Random effects mode Prediction interval	51	•	0.29	[0.01; 0.84] [0.00; 1.13]	~	Random effects mod	el		2.46	[0.91; 4.52]	-	
Heterogeneity: $l^2 = 26\%$ , $\tau^2 =$	0.0008, $\chi^2_e = 1$	.38 (p = 0	25)			Heterogeneity: $I^2 = 0\%$ , $\tau^2 =$	$0, \gamma_{1}^{2} = 4.40$ (r	p = 0.49)		[0.00, 1.13]		Prediction interval Heterogeneity: $l^2 = 61\%$ , $\tau$		55 (n < 0)		0.00; 13.26]	<del></del>	
			er M	0	5 10 15 20 25	interogeneity i = 0 /0, t	18 . 4.40 G				0 2 4 6 8 10	rieterogeneity. 7 = 61%, t	- 0.0000, 7 <sub>23</sub> = 53.	00 (p < 0.)		0		
					PPROM (%)			_			PPROM (%)						PPROM (%)	)

- The overall incidence of perioperative complications is low
- More often in PEIC than in HIC or UIC
- Poor documentation of occurrence and timing (ie, perioperative or later in pregnancy
- Urgent need for uniform complication reporting

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