Bilaga till rapport

Undersökning av kromosomavvikelser i embryot vid assisterad befruktning/Effectiveness, complications and health economic and ethical aspects of preimplantation genetic testing for aneuploidy (PGT-A) during *in vitro* fertilisation (IVF) report 393 (2025)

Appendix 7 Results for complications

Table 1 Perinatal outcomes reported in each study with acceptable risk of bias.

Study	Outcomes related to birth weight						Outcomes related to gestational age			Other outcomes reported in several studies						Other outcomes reported in single studies
	Continuous data	Low birth weight (LBW)	Very low birth weight (VLBW)	Small for gestational age (SGA)	Large for gestational age (LGA)	Macrosomia	Continuous data	Preterm delivery (PTD)	More preterm delivery (varying definitions)	Perinatal death	Birth defects	Monozygotic twins	Neonatal intensive care	Apgar score	Caesarean section	
Awadalla 2021 [1]	X	X	X			X	X	X	X		X				X	
Belva 2018 [2]	X						X	X			X					
Belva 2023[a][3]	X	X		X	X	X	X	X		X	X		X			
Cozzolino 2023 [4]	X	X	X				X	X			X		X	X	X	
Desmyttere 2012 [5]										X						
DeVos 2009[b,c] [6]												X				
Eldar-Geva 2014[d,e] [7]	X	X	X		X		X	X	X						X	Intrauterine growth restriction (IUGR)
El-Toukhy 2009 [8]												X				
Feldman 2020 [9]										X					X	
Forman 2012 [10]											X	X				
Ginström Ernstad 2023 [11]	X	X	X	X	X	X	X	X	X	X	X			X	X	Late birth (week 42 or more)
Gulersen 2021 [12]		X						X					X	X	X	Fetal growth restriction
Gulersen 2022 [13]											X					
Hao 2022 [14]	X	X	X	X	X	X	X	X	X	X	X	X			X	
Hasson 2017 [15]	X	X	X				X	X	X	X	X		X		X	Intrauterine growth restriction (IUGR)
He 2019 [16]	X	X	X			X	X	X	X		X				X	

Ji 2023 [17]	X	X		X	X	X	X	X	X		X				X	Mild birth asphyxia
Kamath 2020 [18]												X				
Kato 2023[f,g] [19]	X						X				X					
Kato 2023[f] [20]	X			X	X		X	X	X		X				X	
Lewis 2021 [21]															X	
Li 2021[h,i] [22]	X			X	X	X	X	X								
Li 2022 [23]	X	X	X			X					X				X	Fetal distress
Li 2022[j] [24]		X						X							X	Prolonged stay for infants/mothers
Liu 2024[h][25]		X	X	X	X			X	X							Extremely low birth weight (ELBW)
Liu 2024[j,k] [26]	X[p]	X[q]				X[q]	X[q]	X[q]			X[q]					Good birth outcome
Lu 2020 [27]	X	X	X	X	X	X	X	X	X		X				X	
Makhijani 2021 [28]	X	X	X				X	X			X		X		X	Fetal growth restriction
Mastenbroek 2007 [29, 30]	X	X		X			X	X		X	X		X	X	X	
Mejia 2022[h] [31]										X						
Meyer 2009 [32]											X					
Munne 2019 [33]											X					
Ozgur 2019 [34]	X															
Ricciarelli 2013 [35]											X					
Richardson 2022 [36]	X			X	X		X	X								
Riestenberg 2021 [37]											X					
Roeca 2020 [38]				X	X											Gestational age adjusted weight
Sarkar 2023[h,i] [39]	X	X	X	X				X	X							
Shi 2023 [40]	X														X	
Sites 2021[h,l] [41]		X						X	X						X	Prolonged stay infant/mother
Snelgrove 2024 [42]	X						X			X						
Srebnik 2023[d] [43]	X					X	X	X	X						X	Maternal readmission within 42 days
Staessen 2004[b,c] [44]												X				
Staessen 2008[b,c] [45]												X				
Sun 2024[m] [46]											X					

Sunkara 2017 [47]		X	X				X	X	X							
Verpoest 2009[b] [48]												X				
Wu 2021 [49]	X	X					X	X			X				X	
Yan 2021 [50, 51]	X			X	X		X	X					X		X	Neonatal infection, Neonatal jaundice, Neonatal respiratory distress syndrome
Zhang 2019 [52]	X	X	X				X	X			X		X	X	X	Neonatal jaundice/hyperbilirubinemia, hypoglycemia, hypothermia, intraventricular hemorrhage, necrotizing enterocolitis, seizure, infection, sepsis, or respiratory distress syndrome
Zheng 2022[m,n] [53]	X	X	X				X	X	X	X	X			X	X	
Zheng 2022[m,o] [54]	X	X	X				X	X	X		X			X	X	

[a] No results reported as not possible to choose which comparison groups to include
[b] May be same population as other studies from Vrije Universiteit Brussel
[c] No results reported as same population and outcomes in Verpoest 2009 [48]
[d] May be same population as other studies from Shaare Zedek Medical Centre
[e] Some results not reported as same population and outcomes in Srebnik 2023 [43]
[f] May be same population as other studies from Kato Ladies Clinic
[g] Some results not reported as same population and outcomes in Kato 2023 [20]
[h] May be same population as other studies from Society for Assisted Reproductive Technology Clinic Outcome Reporting System (SART CORS)
[i] No results reported as same population and outcomes in Liu 2024 [25]
[j] May be same population as other studies from Shandong University
[k] Some results not reported as same population and outcomes in Li 2022 [24]
[l] Some results not reported as same population and outcomes in Liu 2024 [25]
[m] May be same population as other studies from Zhengzhou University
[n] Some results not reported as same population and outcomes in Sun 2024 [46]
[o] No results reported as same population and outcomes in Sun 2024 [46]
[p] For age groups <38 and ≥38 years
[q] For age group ≥38 years

Table 2 Placenta related outcomes reported in each study with acceptable risk of bias.

Study	Gestational hypertension	Preeclampsia	Eclampsia	Placenta previa	Placental abruption	Postpartum hemorrhage	Placenta percreta	Placenta accreta	Other similar outcomes for mother
Awadalla 2021 [1]		X							
Belva 2023[a] [3]	X								
Cozzolino 2023 [4]		X							
Ginström Ernstad 2023 [11]	X	X		X	X	X			
Gulersen 2021 [12]	X	X			X			X	Preeclampsia with severe features
Hao 2022 [14]	X			X					
Hasson 2017 [15]	X								Transfusion
Ji 2023 [17]	X	X		X	X	X		X	Hypertensive disorders of pregnancy (HDP)
Kato 2023 [20]	X			X	X			X	Haemolysis, Elevated Liver enzymes and Low Platelets (HELLP) syndrome
Li 2022 [23]	X			X	X				
Li 2022[b][24]	X					X			Abnormal placentation Preeclampsia with severe features and eclampsia
Liu 2024[b,c][26]	X[f]	X[f]	X[f]	X[f]		X[f]			
Lu 2020 [27]	X								
Makhijani 2021 [28]	X			X	X	X		X	
Richardson 2022 [36]		X							Hypertensive disorders (preeclampsia, pregnancy-induced hypertension, and chronic hypertension) Abnormal placentation (preeclampsia, pregnancy-induced hypertension, placental abruption, or placenta previa)

Riestenberg 2021 [37]								X	
Sites 2021 [41]	X	X							Placental abnormalities combined
Snelgrove 2024 [42]		X		X					Velamentous cord
Srebnik 2023 [43]	X	X			X	X			Composite placental complications during pregnancy (gestational hypertension, preeclampsia, severe preeclampsia, placental abruption) Composite post-partum placental related complications (manual lysis of placenta, revision of uterine cavity, haemoglobin drop, post-partum hemorrhage, need for blood transfusion)
Yan 2021 [50, 51]	X	X		X					
Zhang 2019 [52]	X	X		X	X	X		X	Preeclampsia with severe features
Zheng 2022[d][53]	X	X		X					
Zheng 2022 [d,e][54]	X			X					

[a] No results reported as not possible to choose which comparison groups to include
[b] May be same population as other studies from Shandong University
[c] Some results not reported as same population and outcomes in Li 2022 [24]
[d] May be same population as other studies from Zhengzhou University
[e] No results reported as same population and outcomes in Zheng 2022 [53]
[f] For age group ≥38 years

Vote counting for direction of effect

Results for each study reported separately for each outcome

Table 3 Low birth weight.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Cozzolino 2023 [4]	LBW (<2500g)	Moderate	Adjusted					5.9	6.5	aOR 0.84	CI (0.60, 1.17)	Control
Ginström Ernstad 2023[a][11]	LBW (<2500g)	Moderate	Adjusted	19	390	3145	61 060	4.9	5.2	aOR 1.17	CI (0.71, 1.91)	PGT
Gulersen 2021[a] [12]	LBW (<2500g)	Moderate	Adjusted	38	496	43	519	7.7	8.3	aOR 1.01	CI (0.63, 1.62)	PGT
Hao 2022 [14]	LBW (<2500g)	Moderate	Adjusted	41	821	43	1 046	5.0	4.1	aOR 1.12	CI (0.59, 2.11)	PGT
He 2019 [16]	LBW (<2500g)	Serious	Adjusted	22	646	24	612	3.4	3.9	aOR 0.86	CI (0.47, 1.57)	Control
Li 2022 [24]	LBW (<2500g)	Moderate	Adjusted	49	1 088	169	4324	4.5	3.9	aOR 1.38	CI (0.98, 1.94)	PGT
Li 2022[b] Grade A [23]	LBW (<2500g)	Serious	Adjusted	8	230	15	212	3.5	7.1	aOR 0.49	CI (0.19, 1.27)	Control
Li 2022[b] Grade B [23]	LBW (<2500g)	Serious	Adjusted	48	1 322	69	1816	3.6	3.8	aOR 0.95	CI (0.64, 1.41)	Control
Li 2022[b] Grade C [23]	LBW (<2500g)	Serious	Adjusted	13	301	35	978	4.3	3.6	aOR 1.11	CI (0.55, 2.22)	PGT
Liu 2024 [25]	LBW (<2500g)	Moderate	Adjusted	1451	2 1584	1938	24 128	6.7	8.0	aOR 0.8	CI (0.7, 0.92)	Control
Lu 2020 [27]	LBW (<2500g)	Moderate	Adjusted	18	305	25	328	5.9	7.6	aOR 0.74	CI (0.36, 1.50)	Control
Makhijani 2021[a] [28]	LBW (<2500g)	Moderate	Adjusted	25	239	36	508	10.5	7.1	aOR 0.60	CI (0.33, 1.08)	Control
Sunkara 2017 [47]	LBW (<2500g)	Moderate	Adjusted	24	439	8138	87 571	5.5	9.3	aOR 0.58	CI (0.38, 0.88)	Control
Zhang 2019[c] [52]	LBW (<2500g)	Moderate	Adjusted	13	155	13	150	8.4	8.7	aOR 0.85	CI (0.37, 1.93)	Control
Zheng 2022[a] [53]	LBW (<2500g)	Moderate	Adjusted	10	232	119	2 829	4.3	4.2	aOR 0.98	CI (0.49, 1.97)	Control
Awadalla 2021 [1]	LBW (<2500g)	Moderate	Unadjusted	8	67	7	78	11.9	9.0	RR 1.33	CI (0.51, 3.48)	PGT
Eldar-Geva 2014 [7]	LBW (<2500g)	Serious	Unadjusted	7	158	19	158	4.4	12.0		p=0,04	Control
Hasson 2017 [15]	LBW (<2500g)	Serious	Unadjusted	5	51	8	83	9.8	9.6			PGT
Ji 2023 [17]	LBW (<2500g)	Moderate	Unadjusted	10	215	18	385	4.65	4.67			Control
Mastenbroek 2007 [29]	LBW (<2500g)	Serious	Unadjusted	2	31	1	42	6.5	2.4			PGT
Wu 2021 [49]	LBW (<2500g)	Serious	Unadjusted	3	78	13	184	3.8	7.1		p=0.407	Control

[a] Point estimate for adjusted data in opposite direction of unadjusted data.

[b] Data reported separately for different embryo morphologic grades.

[c] Percentages and numbers per group reported in article not completely consistent. Here numbers per group are used.

Table 4 Preterm birth.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Cozzolino 2023 [4]	<37 weeks	Moderate	Adjusted							aOR 1.00	CI (0.79, 1.28)	None
Ginström Ernstad 2023 [11]	<37 weeks	Moderate	Adjusted	30	390	4 434	61 060	7.7	7.3	aOR 1.22	CI (0.82, 1.81)	PGT
Gulersen2021 [12]	<37 weeks	Moderate	Adjusted	50	496	64	519	10.1	12.3	aOR 0.78	CI (0.52, 1.16)	Control
Hao 2022 [14]	<37 weeks	Moderate	Adjusted	77	835	107	1063	9.2	10.1	aOR 0.9	CI (0.57, 1.43)	Control
He 2019 [16]	<37 weeks	Serious	Adjusted	55	646	57	612	8.5	9.3	aOR 0.9	CI (0.61, 1.33)	Control
Li 2022[a] [24]	<37 weeks	Moderate	Adjusted	70	1 088	287	4 324	6.4	6.6	aOR 1.1	CI (0.83, 1.46)	PGT
Liu 2024 [25]	<37 weeks	Moderate	Adjusted	4 529	21 584	5230	24 128	21.0	21.7	aOR 0.93	CI (0.85, 1.02)	Control
Lu 2020 [27]	<37 weeks	Moderate	Adjusted	31	305	38	328	10.2	11.6	aOR 0.72	CI (0.41, 1.28)	Control
Makhijani 2021[a] [28]	<37 weeks	Moderate	Adjusted	37	241	64	515	15.4	12.4	aOR 0.79	CI (0.49, 1.27)	Control
Sunkara 2017 [47]	<37 weeks	Moderate	Adjusted	28	439	7 968	87 571	6.4	9.1	aOR 0.66	CI (0.45, 0.98)	Control
Yan 2021[a] [51]	Preterm delivery	Low	Adjusted	27	462	23	478	5.8	4.8	aOR 0.51	CI (0.15, 1.71)	Control
Zhang 2019[a,b] [52]	<37 weeks	Moderate	Adjusted	19	155	17	150	12.3	11.3	aOR 0.98	CI (0.48, 1.99)	Control
Zheng 2022 [53]	<37 weeks	Moderate	Adjusted	16	232	154	2829	6.9	5.4	aOR 1.27	CI (0.72, 2.25)	PGT
Awadalla 2021 [1]	<37 weeks	Moderate	Unadjusted	8	67	6	78	11.9	7.7	RR 1.55	CI (0.57, 4.25)	PGT
Belva 2018 [2]	<37 weeks	Moderate	Unadjusted	10	87	8	87	11.5	9.2		p=0.8	PGT
Hasson 2017 [15]	<37 weeks	Serious	Unadjusted	7	51	9	83	13.7	10.8			PGT
Ji 2023 [17]	<37 weeks	Moderate	Unadjusted	15	215	48	385	7.0	12.5			Control
Kato 2023 RIF[c] [20]	<37 weeks	Moderate	Unadjusted	9	113	5	82	8.0	6.1			PGT
Kato 2023 RPL[c][20]	<37 weeks	Moderate	Unadjusted	4	95	6	69	4.2	8.7			Control
Mastenbroek 2007 [29]	<37 weeks	Serious	Unadjusted	1	31	2	42	3.2	4.8			Control
Richardson 2022[d] [36]	<37 weeks	Serious	Unadjusted	16	148	9	147	10.8	6.1			PGT
Srebnik 2023 [43]	<37 weeks	Serious	Unadjusted	22	120	93	779	18.3	11.9			PGT
Wu 2021 [49]	Premature birth	Serious	Unadjusted	4	78	17	184	5.1	9.2		p=0.26	Control

[a] Point estimate for adjusted data in opposite direction of unadjusted data.
[b] Percentages and numbers per group reported in article not completely consistent. Here numbers per group are used.
[c] Data reported separately for different populations.
[d] The control group is "Frozen ET".

Table 5 Perinatal death.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Ginström Ernstad 2023 [11]	Perinatal mortality[a] per deliveries (both live and stillborn).	Moderate	Adjusted	<3	390	354	61 060	<0.8	0.6	not applicable due to too few cases		Not clear
Desmyttere 2012 [5]	Perinatal death[b] or neonatal death[c] per delivery.	Serious	Unadjusted	8	678	21	1 078	1.2	1.9	OR 0.6	CI (0.23, 1.42)	Control
Feldman 2020 [9]	Neonatal mortality (of newborns) per live births.	Moderate	Unadjusted	1	345	0	422	0.3	0.0			PGT
Hao 2022 [14]	Stillbirth[d] per clinical pregnancy.	Moderate	Unadjusted	4	989	6	1 352	0.40	0.44	OR 0.91	CI (0.26, 3.23)	Control
Hasson 2017 [15]	Perinatal mortality (stillborn reported) per pregnancies.	Serious	Unadjusted	0	53	1	87	0.0	1.1			Control
Mastenbroek 2007 [29]	Intrauterine death per clinical pregnancy (plus no postpartum deaths).	Moderate	Unadjusted	1	67	1	92	1.5	1.1			PGT
Mejia 2022[e] [31]	Perinatal mortality[f] per	Moderate	Unadjusted					0.5	0.6		p=0.63	Control

	singleton live born.											
Snelgrove 2024 [42]	Stillbirths per pregnancies.	Moderate	Unadjusted	0	38	0	61	0.0	0.0			None
Zheng 2022 [53]	Stillbirths per number of ongoing pregnancies.	Moderate	Unadjusted	1	236	8	2 914	0.4	0.3			PGT

[a] Stillbirth (after week 28 or 22 depending on year) and death in the first week of life
[b] Stillbirth (20 weeks or more or weight over 500g)
[c] Death of live born within 7 days
[d] After week 20
[e] Article does not state numbers per group.
[f] Death of a live born infant before the completion of the 28th day of life.

Table 6 Birth defects at birth.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Cozzolino 2023 [4]	Birth defects per live births	Moderate	Adjusted							aOR 0.98	CI (0.99, 1.03)	Control
Ginström Ernstad 2023 [11]	Birth defects per deliveries (both live and stillbirths)	Moderate	Adjusted	18	390	2556	61 060	4.6	4.2	aOR 1.2	CI (0.75, 1.93)	PGT
Hao 2022 [14]	Birth defects per live births	Moderate	Adjusted	3	835	3	1 063	0.4	0.3	aOR 1.65	CI (0.28, 9.79)	PGT
He 2019 16]	Birth defects per live births	Moderate	Adjusted	17	646	7	612	2.6	1.1	aOR 2.26	CI (0.92, 5.54)	PGT
Li 2022[a] Grade A [23]	Birth defects per live births	Serious	Adjusted	5	230	9	212	2.2	4.2	aOR 0.71	CI (0.19, 2.58)	Control
Li 2022[a] Grade B [23]	Birth defects per live births	Serious	Adjusted	31	1 322	32	1 816	2.3	1.8	aOR 1.46	CI (0.86, 2.48)	PGT
Li 2022[a] Grade C [23]	Birth defects per live births	Serious	Adjusted	9	301	18	978	3.0	1.8	aOR 1.52	CI (0.64, 3.61)	PGT
Lu 2020 [27]	Birth defects per live births	Moderate	Adjusted	5	305	6	328	1.6	1.8	aOR 0.70	CI (0.17, 2.80)	Control
Makhijani 2021 [28]	Overall birth defects (including major and minor) per live births	Moderate	Adjusted	5	241	10	515	2.1	1.9	aOR 1.03	CI (0.31, 3.37)	PGT
Sun 2024 [46]	Birth defects per live births	Moderate	Adjusted	5	857	13	601	0.6	2.2	aOR 0.24	CI (0.08-0.70)	Control
Zhang 2019[b] [52]	Birth defects per live births	Serious	Adjusted	9	155	3	150	5.8	2.0	aOR 3.10	CI (0.80, 12.01)	PGT
Awadalla 2021 [1]	Birth defects per live births	Moderate	Unadjusted	0	67	0	78	0.0	0.0			None
Belva 2018 [2]	Major birth defects per live births	Moderate	Unadjusted	7	87	9	87	8.0	10.3			Control
Forman 2012 [10]	Major birth defects per deliveries	Serious	Unadjusted	0	49	0	63	0.0	0.0			None

Hasson 2017 [15]	Major birth defects per pregnancies	Serious	Unadjusted	2	53	3	87	3.8	3.4			PGT
Ji 2023 [17]	Birth defects per live births	Moderate	Unadjusted	1	215	3	385	0.5	0.8			Control
Kato 2023[c] RIF [20]	Birth defects per live births	Moderate	Unadjusted	4	113	2	82	3.5	2.4		p=0.66	PGT
Kato 2023[c] RPL [20]	Birth defects per live births	Moderate	Unadjusted	1	95	1	69	1.1	1.4		p=0.82	Control
Liu 2024[d] [26]	Birth defects per deliveries	Moderate	Unadjusted	0	26	0	7	0.0	0.0			None
Meyer 2009[e] [32]	Major or minor birth defects in singles per births	Moderate	Unadjusted	0	6	0	15	0.0	0.0			None
Ricciarelli 2013[f] [35]	Birth defects per live births	Serious	Unadjusted	1	188	39	5092	0.5	0.8			Control
Wu 2021 [49]	Birth defects per live births	Moderate	Unadjusted	1	78	0	184	1.3	0.0		p=0.30	PGT

[a] Data reported separately for different embryo morphologic grades.
[b] Percentages and numbers per group reported in article not completely consistent. Here numbers per group are used.
[c] Data reported separately for different populations.
[d] Subgroup >38 years
[e] Both single and multiple births in the denominator as data in study unclear.
[f] Control group combination of IVF, ICSI and FET groups.

Table 7 Birth defects at ultrasound.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Gulersen 2022 [13]	Major malformations at ultrasound per pregnancies	Moderate	Adjusted	6	208	7	211	2.9	3.3	aOR 0.88	CI (0.32, 2.33)	Control
Mastenbroek 2007[a] [29]	Malformations in singles at ultrasound per clinical pregnancies	Moderate	Unadjusted	0	67	1	92	0.0	1.1			Control
Munne 2019[a] [33]	Malformations in singles at ultrasound per patients with a positive beta-hCG	Low	Unadjusted	0	194	2	201	0.0	1.0			Control
Riestenberg 2021 [37]	Malformations per pregnancies	Serious	Unadjusted	68	475	36	236	14.3	15.3			Control

[a] Both single and multiple pregnancies in the denominator.

Table 8 Monozygotic twins.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Kamath 2020 [18]	Monozygotic twin births per live births	Moderate	Adjusted	32	1 448	766	54 646	2.2	1.4	aOR 1.43	CI (0.97, 2.12)	PGT
El-Toukhy 2009 [8]	Monozygotic twin pregnancies per ongoing pregnancies	Serious	Unadjusted	1	11	0	65	9.1	0.0			PGT
Forman 2012 [10]	Monozygotic twins per deliveries	Moderate	Unadjusted	1	49	0	63	2.0	0.0			PGT
Hao 2022 [14]	Monozygotic twin births per live births	Moderate	Unadjusted	13	848	17	1 080	1.5	1.6			Control
Verpoest 2009 [48]	Monozygotic twin pregnancies per pregnancies	Moderate	Unadjusted	9	618	20	947	1.5	2.1			Control

Table 9 Gestational hypertension.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Ginström Ernstad 2023 [11]	Hypertensive disorders of pregnancy (HDP)	Moderate	Adjusted	17	390	3643	61 060	4.4	6.0	aOR 0.98	CI (0.6, 1.61)	Control
Gulersen 2021 [12]	Gestational hypertension	Moderate	Adjusted	17	496	21	519	3.4	4.0	aOR 0.86	CI (0.45, 1.66)	Control
Hao 2022 [14]	Hypertensive disorders of pregnancy (HDP)	Moderate	Adjusted	24	835	45	1063	2.9	4.2	aOR 0.72	CI (0.35, 1.46)	Control
Ji 2023 [17]	Gestational hypertension	Moderate	Adjusted	13	215	10	385	6.0	2.6	aOR 2.91	CI (1.18, 7.18)	PGT
Li 2022 [24]	Pregnancy-induced hypertension and pre-eclampsia (PIH–PET)	Moderate	Adjusted	54	1 088	206	4 324	5.0	4.8	aOR 1.1	CI (0.8, 1.51)	PGT
Li 2022[a] Grade A [23]	Hypertensive disorders of pregnancy (HDP)	Serious	Adjusted	13	230	15	212	5.7	7.1	aOR 0.73	CI (0.31, 1.74)	Control
Li 2022[a] Grade B [23]	Hypertensive disorders of pregnancy (HDP)	Serious	Adjusted	46	1 322	81	1 816	3.5	4.5	aOR 0.83	CI (0.56, 1.23)	Control
Li 2022[a] Grade C [23]	Hypertensive disorders of pregnancy (HDP)	Serious	Adjusted	15	301	41	978	5.0	4.2	aOR 1.46	CI (0.76, 2.81)	PGT
Lu 2020[b] [27]	Hypertensive disorders of pregnancy (HDP)	Moderate	Adjusted	13	305	10	328	4.3	3.0	aOR 0.84	CI (0.34, 2.09)	Control
Makhijani 2021 [28]	Hypertensive disorders of pregnancy (HDP)	Moderate	Adjusted	30	241	48	515	12.4	9.3	aOR 1.94	CI (1.07, 3.52)	PGT
Sites 2021[b] [41]	Gestational hypertension	Moderate	Adjusted		585		2 191	5.3	5.2	aOR 0.85	CI (0.46, 1.59)	Control
Yan 2021 [51]	Gestational hypertension	Low	Adjusted	10	462	7	478	2.2	1.5	aOR 3.29	CI (0.39, 27.65)	PGT
Zheng 2022 [53]	Gestational hypertension	Moderate	Adjusted	12	232	67	2 829	5.2	2.4	aOR 2.58	CI (1.32, 5.05)	PGT
Zhang 2019[c] [52]	Gestational hypertension	Moderate	Unadjusted	3	155	3	150	1.9	2.0		p=1.0	Control

Hasson 2017 [15]	Pregnancy-induced hypertension and pre-eclampsia (PIH–PET)	Serious	Unadjusted	2	51	6	83	3.9	7.2			Control
Kato 2023[d] RIF [20]	Hypertensive disorders of pregnancy (HDP)	Moderate	Unadjusted	10	113	3	82	8.8	3.7		p=0.151	PGT
Kato 2023[d] RPL [20]	Hypertensive disorders of pregnancy (HDP)	Moderate	Unadjusted	1	95	1	69	1.1	1.4		p=0.819	Control
Srebnik 2023 [43]	Gestational hypertension	Serious	Unadjusted	3	120	34	779	2.5	4.4			Control

[a] Data reported separately for different embryo morphologic grades.
[b] Point estimate for adjusted data in opposite direction of unadjusted data.
[c] Percentages and numbers per group reported in article not completely consistent. Here numbers per group are used.
[d] Data reported separately for different populations.

Table 10 Preeclampsia.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Cozzolino 2023 [4]	Preeclampsia	Moderate	Adjusted					4.3 % more in PGT		aOR 1.24	CI (0.87, 1.77)	PGT
Ginström Ernstad 2023 [11]	Preeclampsia	Moderate	Adjusted	8	390	2 562	61 060	2.1	4.2	Not applicable, too few cases		Control
Gulersen 2021 [12]	Preeclampsia	Moderate	Adjusted	38	496	40	519	7.7	7.7	aOR 0.89	CI (0.53, 1.47)	Control
Sites 2021[a] [41]	Preeclampsia or eclampsia	Moderate	Adjusted		585		2 191	4.3	4.7	aOR 0.82	CI (0.42, 1.61)	Control
Yan 2021 [51]	Preeclampsia	Low	Adjusted	16	462	27	478	3.5	5.6	aOR 0.34	CI (0.09, 1.29)	Control
Zhang 2019[b] [52]	Preeclampsia	Moderate	Adjusted	15	155	5	150	9.7	3.3	aOR 2.95	CI (0.98, 8.92)	PGT
Zheng 2022 [53]	Preeclampsia	Moderate	Adjusted	8	232	62	2 829	3.4	2.2	aOR 1.74	CI (0.78, 3.87)	PGT
Awadalla 2021 [1]	Preeclampsia	Moderate	Unadjusted	0	67	2	78	0.0	2.6			Control
Ji 2023 [17]	Preeclampsia	Moderate	Unadjusted	13	215	18	385	6.0	4.7			PGT
Liu 2024 [26]	Preeclampsia	Moderate	Unadjusted	0	32	0	13	0.0	0.0			None
Richardson 2022[c] [36]	Preeclampsia	Serious	Unadjusted	12	148	6	147	8.1	4.1			PGT
Snelgrove 2024 [42]	Preeclampsia	Moderate	Unadjusted	1	38	1	61	2.6	1.6	RD 3.62	CI (-3.53, 10.7)	PGT
Srebnik 2023 [43]	Preeclampsia	Serious	Unadjusted	1	120	13	779	0.8	1.7			Control

[a.] All with eclampsia have been assumed to have preeclampsia as well.
[b] Percentages and numbers per group reported in article not completely consistent. Here numbers per group are used.
[c] The control group is "Frozen ET".

Table 11 Placenta previa.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Ginström Ernstad 2023 [11]	Placenta previa	Serious	Adjusted	10	390	1 119	61 060	2.6	1.8	aOR 1.21	CI (0.64, 2.28)	PGT
Hao 2022[a] [14]	Placenta previa	Moderate	Adjusted	3	835	6	1 063	0.4	0.6	aOR 1.9	CI (0.32, 11.35)	PGT
Li 2022[b] Grade A [23]	Placenta previa	Serious	Adjusted	1	230	0	212	0.4	0.0	Not reported		PGT
Li 2022[b] Grade B [23]	Placenta previa	Serious	Adjusted	7	1 322	10	1 816	0.5	0.6	aOR 0.64	CI (0.22, 1.83)	Control
Li 2022[b] Grade C [23]	Placenta previa	Serious	Adjusted	1	301	4	978	0.3	0.4	aOR 0.77	CI (0.06, 9.37)	Control
Makhijani 2021 [28]	Placenta previa	Moderate	Adjusted	4	241	16	515	1.7	3.1	aOR 0.40	CI (0.12, 1.39)	Control
Yan 2021[ac] [51]	Placenta previa	Low	Adjusted	4	462	7	478	0.9	1.5	aOR 5.50	CI (0.32, 94.02)	PGT
Zhang 2019[c] [52]	Placenta previa	Moderate	Adjusted	8	155	2	150	5.2	1.3	aOR 3.73	CI (0.74, 18.92)	PGT
Zheng 2022 [53]	Placenta previa	Moderate	Adjusted	8	232	59	2 829	3.4	2.1	aOR 1.90	CI (0.86, 4.20)	PGT
Ji 2023 [17]	Placenta previa	Moderate	Unadjusted	6	215	19	385	2.8	4.9			Control
Kato 2023[d] RIF [20]	Placenta previa	Moderate	Unadjusted	0	113	1	82	0.0	1.2		p=0.24	Control
Kato 2023[d] RPL [20]	Placenta previa	Moderate	Unadjusted	2	95	1	69	2.1	1.4		p=0.76	PGT
Liu 2024[e] [26]	Placenta previa	Moderate	Unadjusted	1	32	0	13	3.1	0.0			PGT
Snelgrove 2024 [42]	Placenta previa	Moderate	Unadjusted	0	38	1	61	0.0	1.6	RD -1.64	CI (-5.77, 2.49)	Control

[a] Point estimate for adjusted data in opposite direction of unadjusted data.
[b] Data reported separately for different embryo morphologic grades.
[c] Percentages and numbers per group reported in article not completely consistent. Here numbers per group are used.
[d] Data reported separately for different populations.
[e] Subgroup >38 years

Table 12 Placental abruption.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Ginström Ernstad 2023 [11]	Placental abruption	Moderate	Adjusted	<3	390	437	61 060	<0.8	0.7	Not applicable, too few cases		Not clear
Gulersen 2021 [12]	Placental abruption	Moderate	Adjusted	7	496	6	519	1.4	1.2	aOR 1.19	CI (0.4, 3.62)	PGT
Li 2022[a] Grade A [23]	Placental abruption	Serious	Adjusted	0	230	0	212	0.0	0.0	Not reported		None
Li 2022[a] Grade B [23]	Placental abruption	Serious	Adjusted	0	1 322	1	1 816	0.0	0.1	Not reported		Control
Li 2022[a] Grade C [23]	Placental abruption	Serious	Adjusted	1	301	1	978	0.3	0.1	Not reported		PGT
Makhijani 2021 [28]	Placental abruption	Moderate	Adjusted	4	241	3	515	1.7	0.6	aOR 1.68	CI (0.27, 10.57)	PGT
Ji 2023 [17]	Placental abruption	Moderate	Unadjusted	1	215	1	385	0.5	0.3			PGT
Kato 2023[b] RIF [20]	Placental abruption	Moderate	Unadjusted	1	113	0	82	0.9	0.0		p=0.393	PGT
Kato 2023[b] RPL [20]	Placental abruption	Moderate	Unadjusted	1	95	0	69	1.1	0.0		p=0.393	PGT
Srebnik 2023 [43]	Placental abruption	Serious	Unadjusted	2	120	23	779	1.7	3.0			Control
Zhang 2019[c] [52]	Placental abruption	Moderate	Unadjusted	1	155	0	150	0.6	0.0	Not reported	p=1.0	PGT

[a] Data reported separately for different embryo morphologic grades.
[b] Data reported separately for different populations.
[c] Percentages and numbers per group reported in article not completely consistent. Here numbers per group are used.

Table 13 Placenta accreta.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Gulersen 2021 [12]	Placenta accreta	Moderate	Adjusted	1	496	2	519	0.2	0.4	aOR 0.63	CI (0.06, 4.73)	Control
Makhijani 2021 [28]	Placenta accreta	Moderate	Adjusted	1	241	2	515	0.4	0.4	aOR 2.67	CI (0.19, 36.81)	PGT
Ji 2023 [17]	Placenta accreta	Moderate	Unadjusted	6	215	14	385	2.8	3.6			Control
Kato 2023[a] RIF [20]	Placenta accreta	Moderate	Unadjusted	1	113	2	82	0.9	2.4		p=0.38	Control
Kato 2023[a] RPL [20]	Placenta accreta	Moderate	Unadjusted	0	95	0	69	0.0	0.0		Not reported	None
Riestenberg 2021 [37]	Placenta accreta[b]	Serious	Unadjusted	10	475	2	237	2.1	0.8			PGT
Zhang 2019[c] [52]	Placenta accreta	Moderate	Unadjusted	2	155	1	150	1.3	0.7	not reported	p=1.0	PGT

[a] Data reported separately for different populations.
[b] At mid-trimester ultrasound
[c] Percentages and numbers per group reported in article not completely consistent. Here numbers per group are used.

Table 14 Postpartum hemorrhage.

Study	Outcome	Risk of bias	Type of data	PGT		Control		PGT	Control	Result	CI or p-value	Group with highest proportion
				Nr with outcome	Nr total	Nr with outcome	Nr total	% with outcome	% with outcome			
Ginström Ernstad 2023[a] [11]	Post partum hemorrhage[b]	Moderate	Adjusted	27	390	4 509	61 060	6.9	7.4	aOR 1.02	CI (0.68, 1.52)	PGT
Li 2022 [24]	Postpartum hemorrhage[c]	Moderate	Adjusted	4	1 088	9	4 324	0.4	0.2	aOR 1.92	CI (0.58, 6.39)	PGT
Makhijani 2021 [28]	Postpartum hemorrhage	Moderate	Adjusted	4	241	5	515	1.7	1.0	aOR 1.40	CI (0.28, 7.02)	PGT
Zhang 2019[d] [52]	Postpartum hemorrhage	Moderate	Adjusted	11	155	6	150	7.1	4.0	aOR 1.29	CI (0.47, 3.56)	PGT
Ji 2023 [17]	Postpartum hemorrhage[c]	Moderate	Unadjusted	28	215	61	385	13.0	15.8			Control
Srebnik 2023 [43]	Postpartum hemorrhage[c]	Serious	Unadjusted	5	120	31	779	4.2	4.0			PGT

[a] Point estimate for adjusted data in opposite direction of unadjusted data.
[b] >1 000ml
[c] >500 ml vaginal delivery or >1 000 ml caesarean section
[d] Percentages and numbers per group reported in article not completely consistent. Here numbers per group are used.

Table 15 Long-term outcomes for children.

Study	Country	Population	Authors conclusions
Nekkebroeck 2008[a] [55]	Belgium	2-year-old children, born 2002-2005	No differences were found for temperament and language development for 2-year-olds between PGD/PGS and ICSI or spontaneous conception (SC). For the CBCL (child behavioural checklist) Externalizing problems, the ICSI mothers reported fewer problems than their PGD/PGS counterparts. CONCLUSIONS: PGD/PGS conception does not adversely affect children's socio-emotional and language development at age 2.
Nekkebroeck 2008[a] [56]	Belgium	2-year-old children, born 2002-2005	Children conceived after PGD/PGS show similar mental and psychomotor developmental outcomes at age 2 to children conceived after ICSI.
Desmyttere 2009 [a] [57]	Belgium	2-year-old children, born 2002-2005	Singleton children at age 2 years born after embryo biopsy applied in PGD/PGS present a similar post-natal linear growth compared with ICSI. PGD/PGS singletons appear not to be at higher risk for congenital malformations and surgical interventions during the first 2 years of life.
Winter 2015[a] [58]	Belgium	5–6-year-old children, born 2002-2005	No differences were detected between the psychosocial development of PGD children and the control groups (ICSI and SC at 5-6 years old). Parents did not differ in reporting problem behaviour.
Winter 2014[a] [59]	Belgium	5–6-year-old children, born 2002-2005	The overall cognitive development of PGD singletons did not differ from controls (ICSI and SC at 5-6 years old). The partial IQ scores for Verbal and Performance intelligence revealed similar results. Motor capacities of PGD singletons did not differ from any of the two other conception groups
Belva 2018[a] [2]	Belgium	6-year-old children, born 2002-2005	This study of 87 PGT-M and PGT-SR conceived singletons showed no differences in anthropometric measurements (waist, mid-upper arm circumference, adiposity, total body fat mass), hospitalization rate, surgical interventions, and blood pressure readings in comparison with a matched cohort of peers born after ICSI without embryo biopsy.
Belva 2023 [3]	Belgium	2-year-old children, born 2014-2018	Embryo biopsy, either at EBD3 (embryo biopsy day 3) or EBD5 (embryo biopsy day 5) in FET (frozen embryo transfer) and FRESH cycles did not negatively affect anthropometry at birth, infancy or childhood compared to outcomes in non-biopsied FET and FRESH cycles. Reassuringly, weight and height gain, proportions of major congenital malformations, developmental problems,

			hospital admissions and surgical interventions were similar between comparison groups
Kato 2023 [19]	Japan	4 months and 1.5-year-old children	None of the children whose mothers underwent PGT-A presented adverse findings at a 1.5-year developmental check-up. The health examination at 4 months and 1.5 years of age showed that all children were growing well, without any physical problems. The KIDS (Kinder Infant Development Scale) for general and nine areas of development yielded no adverse findings.
Mastenbroek 2007 [29, 30]	Netherlands	4-year-old children	PGS does not seem to affect neurological, cognitive, and behavioural development of 4-year-old singletons compared to IVF without PGS.
Ginstrom Ernstad 2023 [11]	Sweden	Up to 4.5-year-old children in PGT group	The absolute risk of asthma was 38/390 (9.7%) in children born after PGT and 6980/61060 (11.4%) in children born after IVF/ICSI, whereas the corresponding numbers were 34/390 (8.7%) and 7505/61060 (12.3%) for allergic disorders. There were no statistically significant differences for these outcomes. Although the results are comparable to IVF/ICSI also regarding early childhood outcome, they should be taken with caution due to the low number of children with diagnoses and short follow-up time (4.6 years for PGT children and 9 years for IVF/ICSI children).

[a] Includes essentially the same children who have been followed up at different time points.

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