



DIABETES PREGNANCY and TECHNOLOGY in Lombardy - 2024

8 GIUGNO 2024 - BERGAMO - OSPEDALE PAPA GIOVANNI XXIII

Dr.ssa ELENA CIRIELLO
USC OSTETRICIA E GINECOLOGIA
ASST PAPA GIOVANNI XXIII - BERGAMO

SESSIONE 2

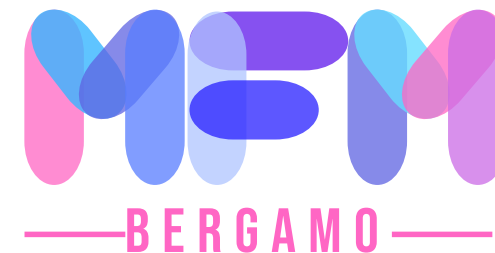
DIABETE GESTAZIONALE - TUTTI I DUBBI SONO RISOLTI?

MODERATORI: **Cristina Romano** (Varese),
Marco Carnelli (Bergamo)

10.40 Monitoraggio clinico-ecografico.
Esiti materni e neonatali
Elena Ciriello (Bergamo)

11.00 Terapia Medica Nutrizionale nel Diabete
Gestazionale
Nadia Cerutti (Milano)

11.20 Terapia del Diabete Gestazionale: Insulina,
metformina o entrambe?
Veronica Resi (Milano), **Eloisa Mariani** (Monza)



La dr.ssa ELENA CIRIELLO dichiara di NON aver ricevuto negli ultimi due anni compensi o finanziamenti da Aziende Farmaceutiche e/o Diagnostiche

Dichiara altresì il proprio impegno ad astenersi, nell'ambito dell'evento, dal nominare, in qualsivoglia modo o forma, aziende farmaceutiche e/o denominazione commerciale e di non fare pubblicità di qualsiasi tipo relativamente a specifici prodotti di interesse sanitario (farmaci, strumenti, dispositivi medico-chirurgici, ecc.).

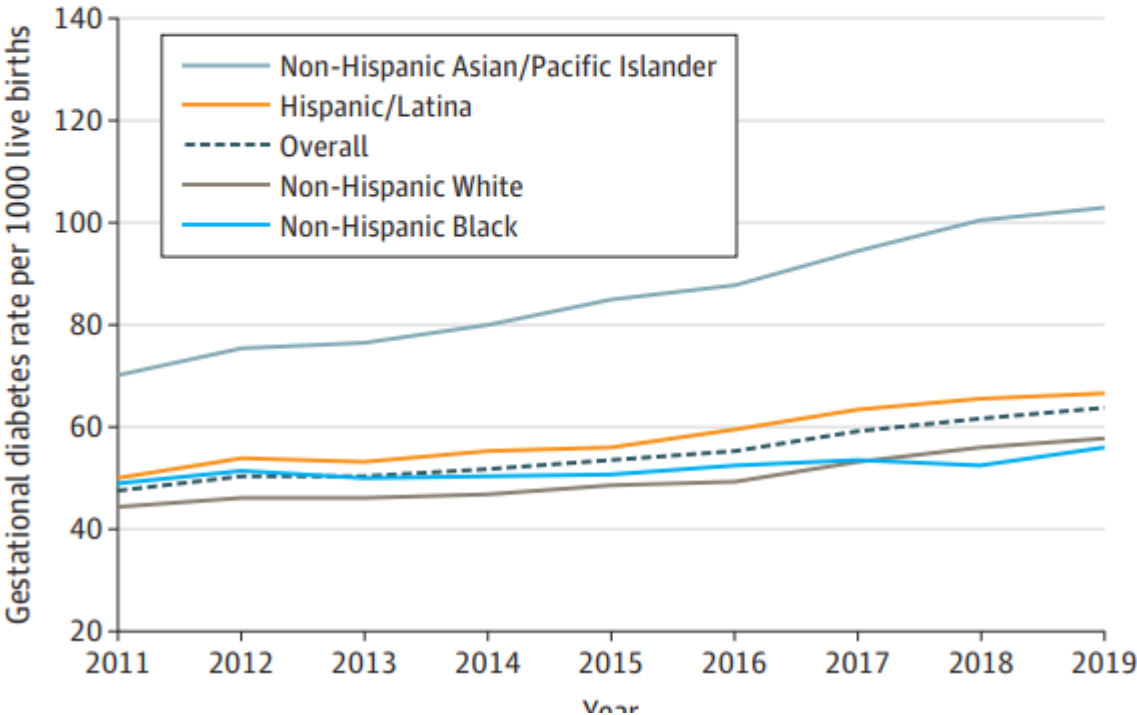
Trends in Gestational Diabetes at First Live Birth by Race and Ethnicity in the US, 2011-2019

Nilay S. Shah, MD, MPH; Michael C. Wang, BA; Priya M. Freaney, MD; Amanda M. Perak, MD, MS; Mercedes R. Carnethon, PhD; Namratha R. Kandula, MD, MPH; Erica P. Gunderson, PhD, MS, MPH; Kai McKeever Bullard, PhD; William A. Grobman, MD, MBA; Matthew J. O'Brien, MD, MSc; Sadiya S. Khan, MD, MSc

Incidenza GDM 4,7 % → 6,4 %

Figure 2. Age-Standardized Rates of Gestational Diabetes in Race and Ethnic Subgroups in Individuals Aged 15 to 44 Years With Singleton First Live Births in the US from 2011 to 2019

A Overall and by race and ethnicity

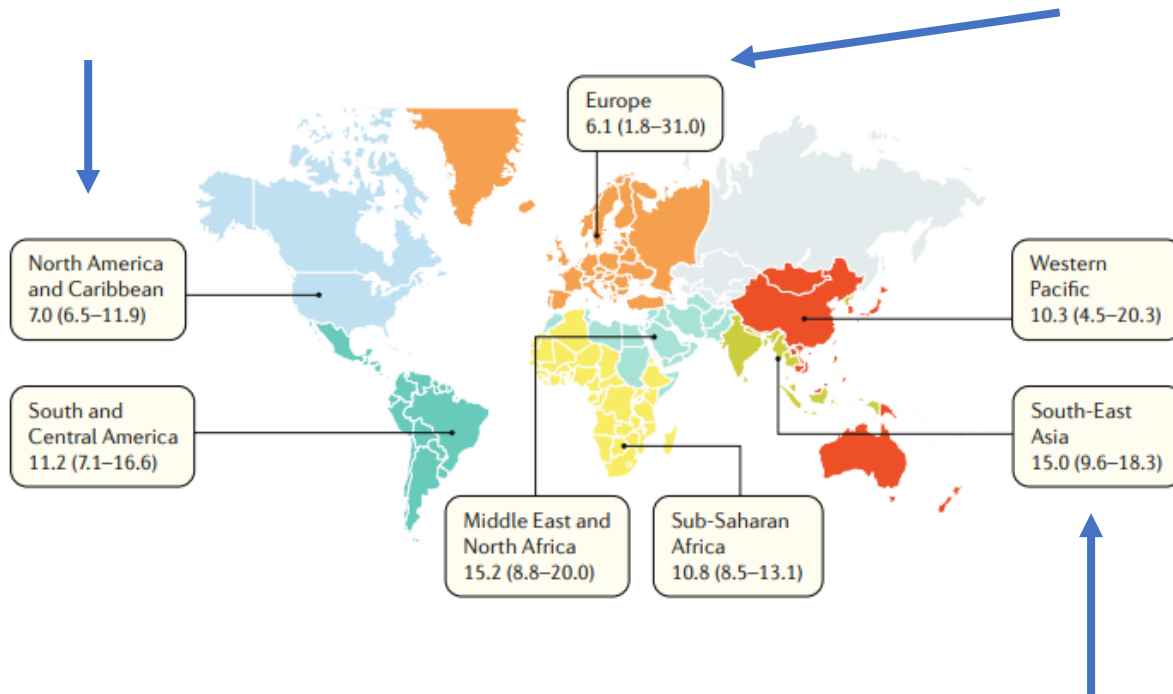


N 12,610,235	%	RR	Rate DG 2019 (%)
Non-Hispanic White	56	Referent group	5,7
Non-Hispanic Black	14	0,97	5,6
Hispanic/Latin	21	1,15	6,6
Non-Hispanic Asian/Pacific Islander	8	1,78	10,2

Gestational diabetes mellitus

H. David McIntyre , Patrick Catalano, Cuilin Zhang, Gernot Desoye, Elisabeth R. Mathiesen & Peter Damm

2005-2018 (WHO)



A global view of hypertensive disorders and diabetes mellitus during pregnancy

2021 (WHO)

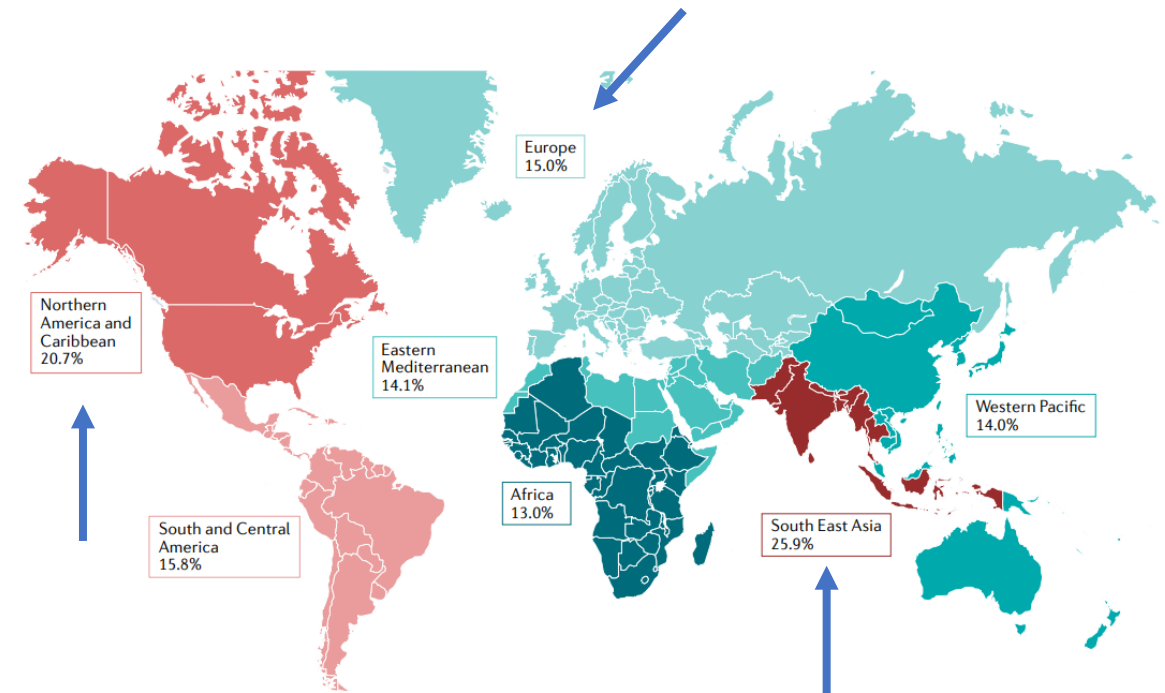


Fig. 5 | **Prevalence of gestational diabetes mellitus in 2021 by WHO region.** The mean prevalence of gestational diabetes mellitus (GDM) (the percentage of all pregnant women with GDM) shows a state of inequity among different regions worldwide. South East Asia has the highest mean prevalence of GDM, followed by North America and the Caribbean. Africa has the lowest mean prevalence of GDM. Data were originally presented in REF.⁵³.

Gestational diabetes mellitus

H. David McIntyre , Patrick Catalano, Cuilin Zhang, Gernot Desoye, Elisabeth R. Mathiesen & Peter Damm

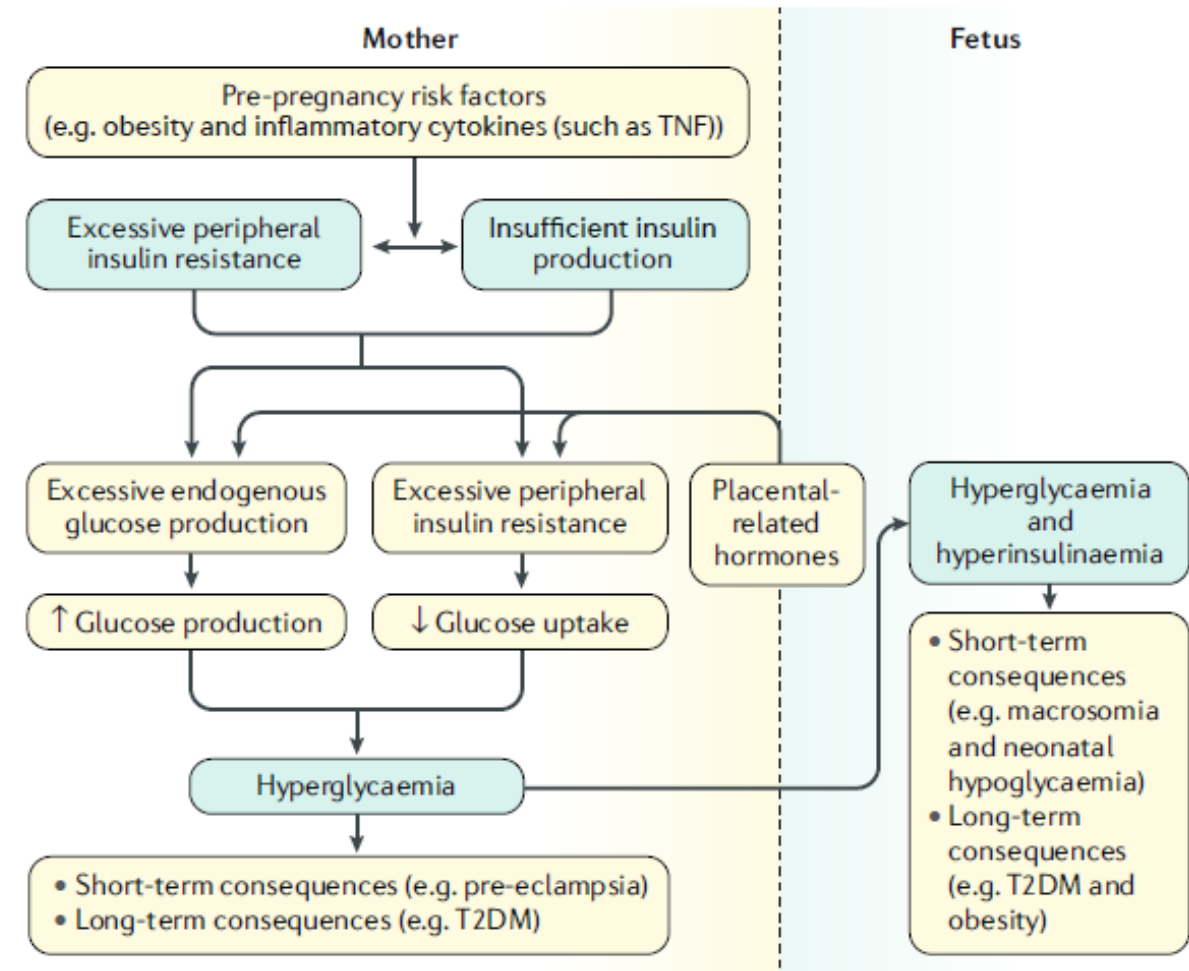
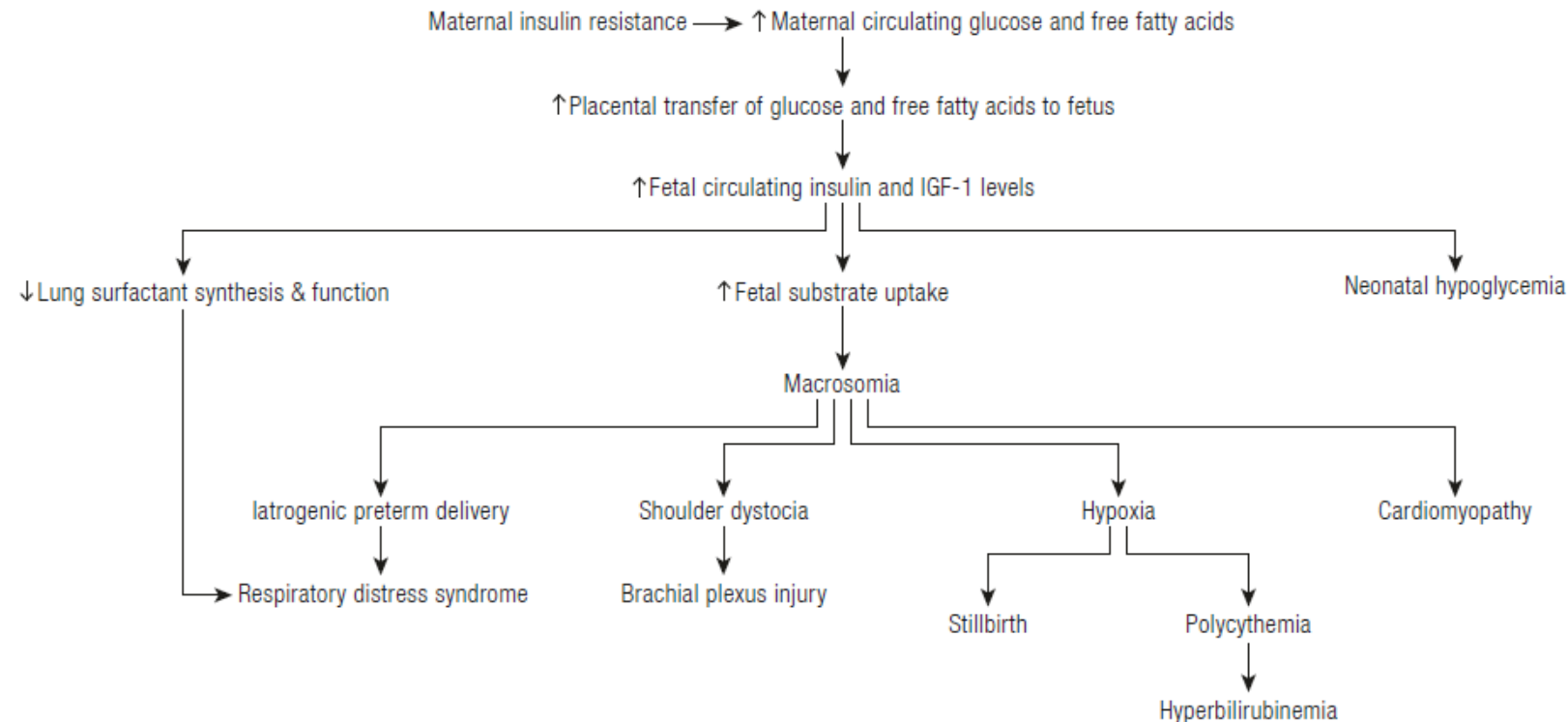


Fig. 3 | **Pathophysiology of GDM.** Women who develop gestational diabetes mellitus (GDM) during pregnancy have evidence of metabolic dysfunction before conception, such as pancreatic β -cell defects and increased insulin resistance. In high-income countries, many women who develop GDM are overweight or obese, which is associated with an inflammatory milieu. With the onset of pregnancy and associated metabolic changes (increased insulin resistance and demand for increased β -cell response because of placental factors), insulin is less effective in suppressing endogenous (primarily hepatic) glucose production and glucose uptake by peripheral skeletal muscle and adipose tissue, which results in clinical hyperglycaemia. Maternal hyperglycaemia results in increased placental transfer of glucose and (fetal) β -cell secretagogues, such as amino acids, to the fetus, leading to fetal hyperinsulinaemia. Fetal hyperinsulinaemia then results in fetal metabolic reprogramming that leads to short-term problems, such as fetal overgrowth and/or adiposity, and long-term problems, such as metabolic dysfunction in later life. T2DM, type 2 diabetes mellitus; TNF, tumour necrosis factor.



A Clinical Update on Gestational Diabetes Mellitus

Arianne Sweeting,^{1,2} Jencia Wong,^{1,2} Helen R. Murphy,^{3,4,5} and Glynis P. Ross,^{1,2}





SHORT-TERM OUTCOME MATERNI

PREECLAMPSIA ²

PARTO PREMATURO

PARTO OPERATIVO / TRAUMA MATERNO

1. Black. Diabetes Care 2013; 36:56
2. Yogev. AJOG 2010; 202:255
3. Dudley. Ob Gyn Clin North Am 2007;34:293
4. Blank. Diabetes Care 1995; 18:127



2008

The **NEW ENGLAND**
JOURNAL of MEDICINE

ESTABLISHED IN 1812

MAY 8, 2008

VOL. 358 NO. 19

Hyperglycemia and Adverse Pregnancy Outcomes

The HAPO Study Cooperative Research Group*

- **MULTICENTRICO OSSERVAZIONALE**
(15 centri di 9 paesi)
- 25505 gravide
- OGTT con 75g di glucosio (24 e 32 wks)

HAPO STUDY



RAZIONALE DELLO STUDIO

Il diabete conclamato aumenta il rischio di
outcome avversi

Quali livelli di intolleranza al glucosio in
gravidanza, al di fuori del diabete conclamato,
sono associati ad outcome materno-fetali-
neonatali sfavorevoli?

Hyperglycemia and Adverse Pregnancy Outcomes

The HAPO Study Cooperative Research Group*

OUTCOME PRIMARI

Peso alla nascita > 90°centile per EG

Primo TC

Ipoglicemia neonatale

C-peptide su sangue funicolare > 90°
centile (iperinsulinemia fetale)

OUTCOME SECONDARI

Parto prematuro (<37w)

Distocia di spalla o traumi ostetrici

Ricovero in TIN

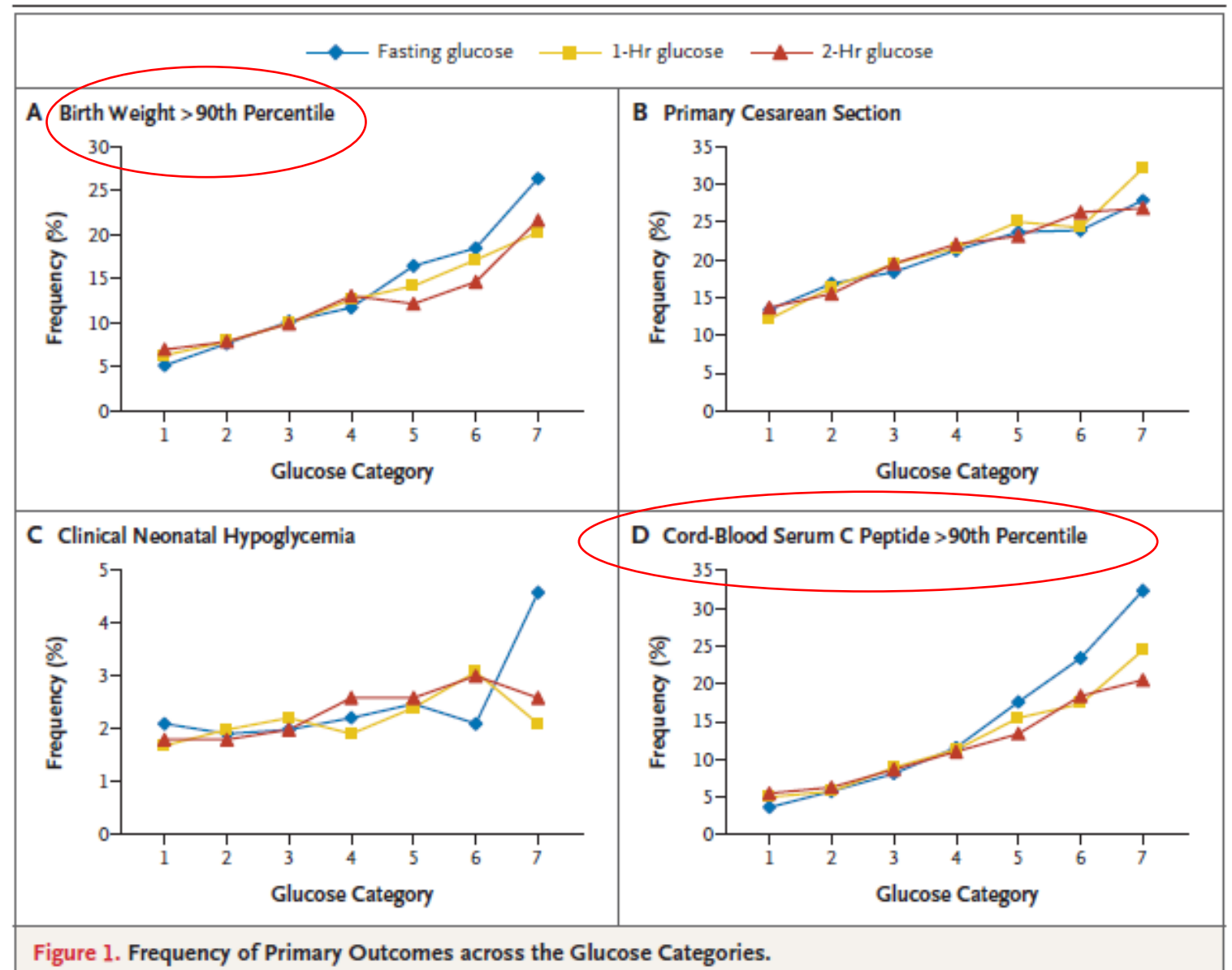
Iperbilirubinemia

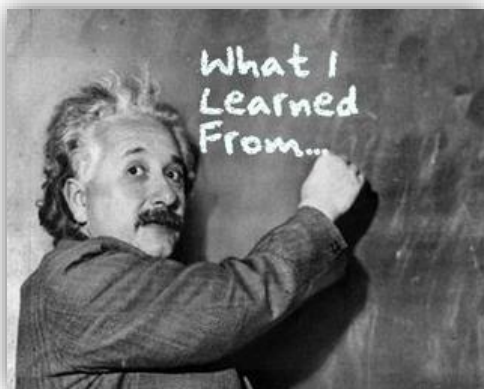
Pre-eclampsia

Hyperglycemia and Adverse Pregnancy Outcomes

The HAPO Study Cooperative Research Group*

N 25505 donne	%
Birth weight > 90° percentile	9,5
Primary cesarean section	16
Clinical neonatal hypoglycemia	2,1
Cord-blood serum C peptide > 90° percentile	8,4





Hyperglycemia and Adverse Pregnancy Outcomes

The HAPO Study Cooperative Research Group*

AUMENTATA INCIDENZA

- Parto prematuro (<37w)
- Distocia di spalla
- Ricovero TIN
- Iperbilirubinemia
- Pre-eclampsia

Table 3. Adjusted Odds Ratios for Associations between Maternal Glycemia as a Continuous Variable and Primary and Secondary Perinatal Outcomes.*

Outcome	Plasma Glucose Level		
	Fasting	At 1 Hr	At 2 Hr
	odds ratio (95% CI)		
Primary outcome			
Birth weight >90th percentile	1.38 (1.32–1.44)	1.46 (1.39–1.53)	1.38 (1.32–1.44)
Primary cesarean section†	1.11 (1.06–1.15)	1.10 (1.06–1.15)	1.08 (1.03–1.12)
Clinical neonatal hypoglycemia	1.08 (0.98–1.19)‡	1.13 (1.03–1.26)	1.10 (1.00–1.12)
Cord-blood serum C peptide >90th percentile	1.55 (1.47–1.64)	1.46 (1.38–1.54)	1.37 (1.30–1.44)
Secondary outcome			
Premature delivery (before 37 wk)	1.05 (0.99–1.11)	1.18 (1.12–1.25)	1.16 (1.10–1.23)
Shoulder dystocia or birth injury	1.18 (1.04–1.33)	1.23 (1.09–1.38)	1.22 (1.09–1.37)
Intensive neonatal care	0.99 (0.94–1.05)	1.07 (1.02–1.13)	1.09 (1.03–1.14)
Hyperbilirubinemia	1.00 (0.95–1.05)	1.11 (1.05–1.17)	1.08 (1.02–1.13)
Preeclampsia	1.21 (1.13–1.29)	1.28 (1.20–1.37)	1.28 (1.20–1.37)

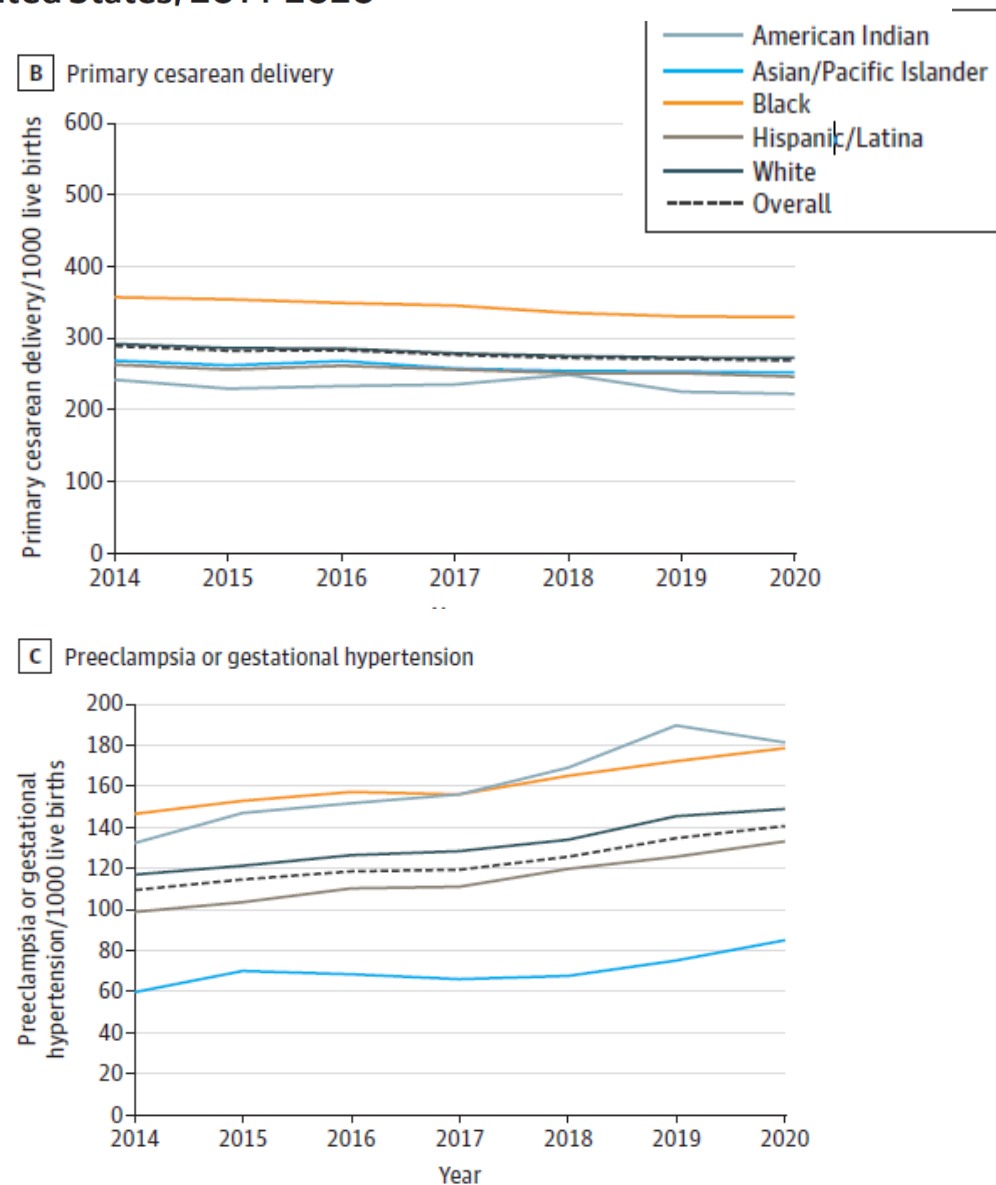
Gestational diabetes mellitus

H. David McIntyre , Patrick Catalano, Cuilin Zhang, Gernot Desoye, Elisabeth R. Mathiesen & Peter Damm

Table 2 | Outcomes from the HAPO study and the HAPO-FUS

Outcome	GDM ^a (%)	Non-GDM (%)	Statistical significance
<i>Perinatal outcomes^b</i>			
Pre-eclampsia	9.1	4.5	$P < 0.001$
Preterm delivery (<37 weeks)	9.4	6.4	$P < 0.001$
Primary caesarean delivery	24.4	16.8	$P < 0.001$
Shoulder dystocia or birth injury	1.8	1.3	$P < 0.01$
Birthweight greater than ninetieth percentile	16.2	8.3	$P < 0.001$
Neonate percentage body fat greater than ninetieth percentile	16.6	8.5	$P < 0.001$
Cord blood C-peptide level greater than ninetieth percentile	17.5	6.7	$P < 0.001$
Clinical neonatal hypoglycaemia	2.7	1.9	$P < 0.001$
Admission to newborn intensive care	9.1	7.8	$P < 0.01$

Risk of Adverse Pregnancy Outcomes Among Pregnant Individuals With Gestational Diabetes by Race and Ethnicity in the United States, 2014-2020



LARGE FOR GESTATIONAL AGE

JAMA. 2022 Apr 12; 327(14): 1356–1367.

Published online 2022 Apr 12. doi: 10.1001/jama.2022.3189; 10.1001/jama.2022.3189

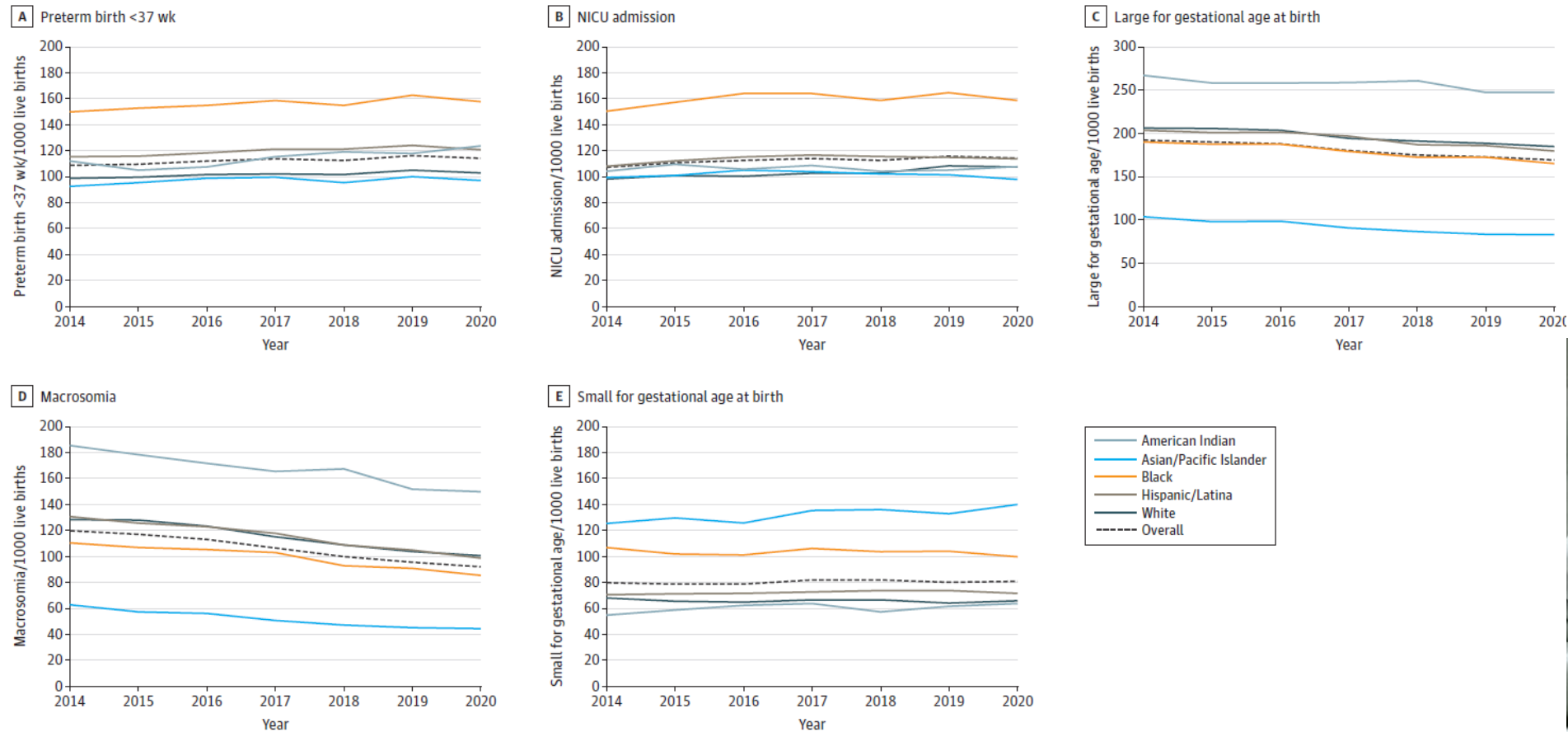
PMCID: PMC9006108

PMID: [35412565](#)

Risk of Adverse Pregnancy Outcomes Among Pregnant Individuals With Gestational Diabetes by Race and Ethnicity in the United States, 2014-2020

2022

Figure 3. Infant Outcomes (Frequency per 1000 Live Births) From 2014 to 2020 to Pregnant Individuals Aged 15 to 44 Years With Gestational Diabetes



Shoulder dystocia and associated risk factors with macrosomic infants born in California

Thomas S. Nesbitt, MD, MPH,^a William M. Gilbert, MD,^a and Beate Herrchen, PhD^b
Davis and Berkeley, California

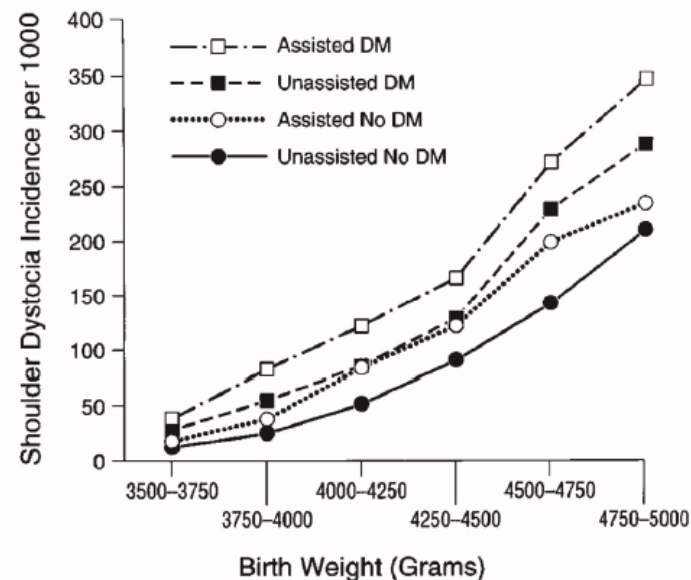


Fig 2. Mean frequency of shoulder dystocia for increasing birth weight for (1) spontaneous vaginal delivery in nondiabetic patients, (2) spontaneous vaginal delivery in diabetic patients, (3) assisted vaginal delivery in nondiabetic patients, and (4) assisted vaginal births in diabetic patients.

- 178.000 neonati
- > 3500 g
- California - 1992

Peso fetale (g)	No-DM (%)	DM (%)	DM + forcipe/VO (%)
4250 - 4500	9,1	12,3	16,7
4500 - 4750	14,3	19,9	27,3
4750 – 5000	21,1	23,5	34,8

(Am J Obstet Gynecol 1998;179:476-80.)

Shoulder dystocia and associated risk factors with macrosomic infants born in California

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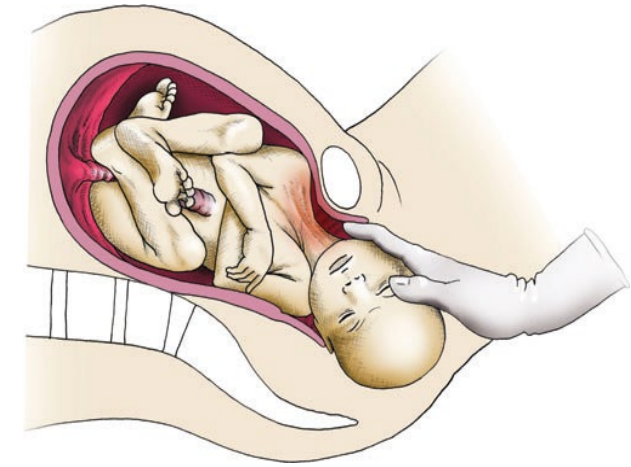


Table III. Neonatal outcomes for all vaginal deliveries of infants (including those with maternal diabetes) with and without shoulder dystocia, for births of infants >3500 g in California, 1992

Variable	Births without shoulder dystocia (%)		Births with shoulder dystocia (%)		Statistical significance	
	Without maternal diabetes	With maternal diabetes	Without maternal diabetes	With maternal diabetes	Without maternal diabetes	With maternal diabetes
Brachial plexus injury	0.09	0.15	5.30	7.53	$P = .001$	$P = .001$
Birth trauma	3.86	0.15	7.30	23.97	$P = .001$	$P = .001$
Severe asphyxia	0.13	0.23	0.078	1.01	$P = .001$	$P = .001$
Mild asphyxia	0.51	0.75	1.55	1.63	$P = .001$	$P = .001$
"Nonnormal neonate" by DRG at discharge	27.85	39.41	43.49	55.55	$P = .001$	$P = .001$
Death	0.10	0.15	0.16	0.39	$P = .082$	$P = .030$
Length of stay >3 d	6.72	12.67	7.56	14.66	$P = .0006$	$P = .037$
Length of stay >5 d	2.19	4.44	3.57	7.45	$P = .001$	$P = .001$

Risk of Stillbirth in Pregnancies Complicated by Diabetes, Stratified by Fetal Growth

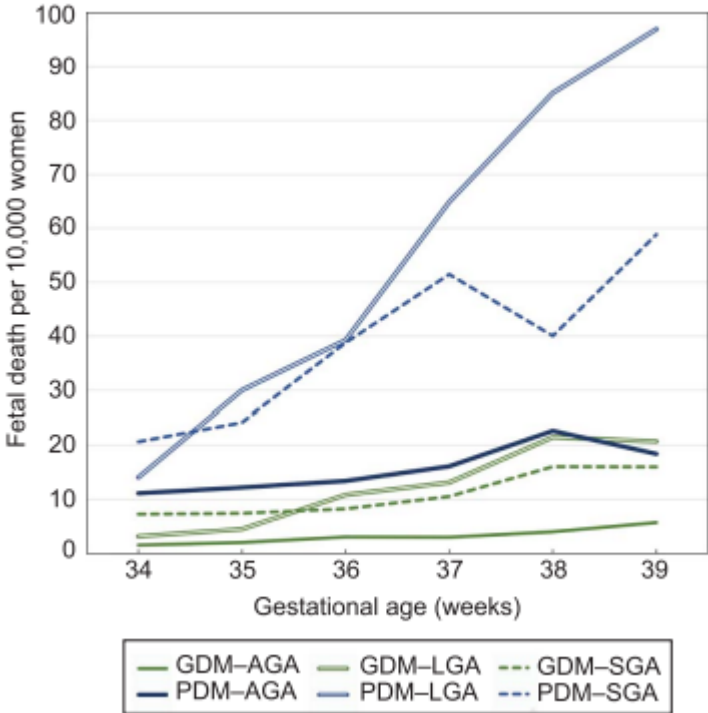


Table 4. Conditional Stillbirth Rates Per 10,000 Patients in Pregnancies Complicated by Gestational Diabetes

GA (wk)	AGA	LGA	SGA
34	1.5 (1.3–1.9)	3.2 (2.3–4.2)	7.2 (5.2–9.8)
35	2 (1.7–2.4)	4.5 (3.4–5.8)	7.4 (5.4–10)
36	3 (2.6–3.5)	10.8 (9.1–12.8)	8.2 (6–11)
37	3 (2.5–3.5)	13.1 (11.1–15.4)	10.5 (7.9–13.8)
38	4 (3.4–4.6)	21.5 (18.5–24.9)	16 (12.3–20.5)
39	5.7 (4.8–6.8)	20.7 (16.5–25.6)	16 (11.1–22.2)

GA, gestational age; AGA, appropriate for gestational age; LGA, large for gestational age; SGA, small for gestational age. Data are median (range).



LONG – TERM OUTCOME MATERNO-FETALI

- Aumentata incidenza di diabete tipo 2 e malattie cardiovascolari ^{1,4}
- Aumentata incidenza dei neonati di sviluppare obesità, sindrome metabolica²
- Dubbia correlazione con autismo³

Diabetes Metab J 2022;46:3-14

1..England . AJOG 2009;200:365

2. Hillier. Diabetes Care 2007

3. Xiang. JAMA 2015

Risk of Adverse Pregnancy Outcomes Among Pregnant Individuals With Gestational Diabetes by Race and Ethnicity in the United States, 2014-2020

2022

Outcome	GDM ^a (%)	Non-GDM (%)	Statistical significance
Long-term outcomes ^c			
Maternal diabetes	10.7	1.6	$P < 0.001$
Maternal pre-diabetes	41.5	18.4	$P < 0.001$
Offspring overweight or obesity	39.5	28.6	$P < 0.001$
Offspring obesity	19.1	9.9	$P < 0.001$
Offspring percentage body fat greater than eighty-fifth percentile	21.7	13.9	$P < 0.001$
Offspring impaired fasting glucose (ADA threshold of ≥ 5.6 mmolL ⁻¹)	9.2	7.4	Not significant
Offspring impaired glucose tolerance	10.6	5.0	$P < 0.001$
Offspring diabetes	0.3	0.2	Not significant

Hyperglycemia During Pregnancy and Long-Term Offspring Outcomes

Monica E. Bianco^{1,2}, Jami L. Josefson^{1,2}

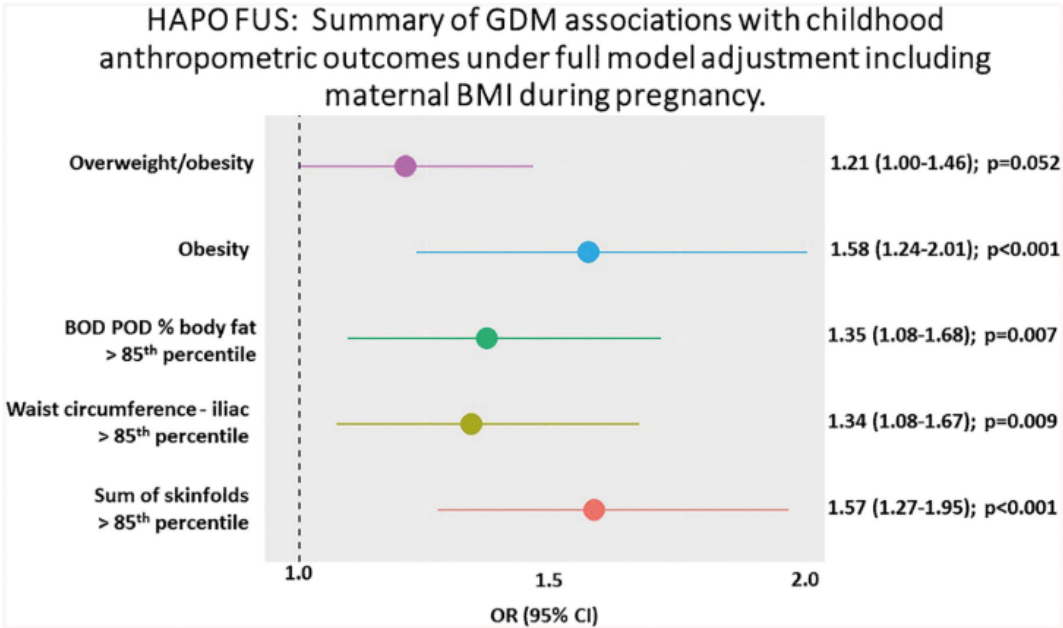
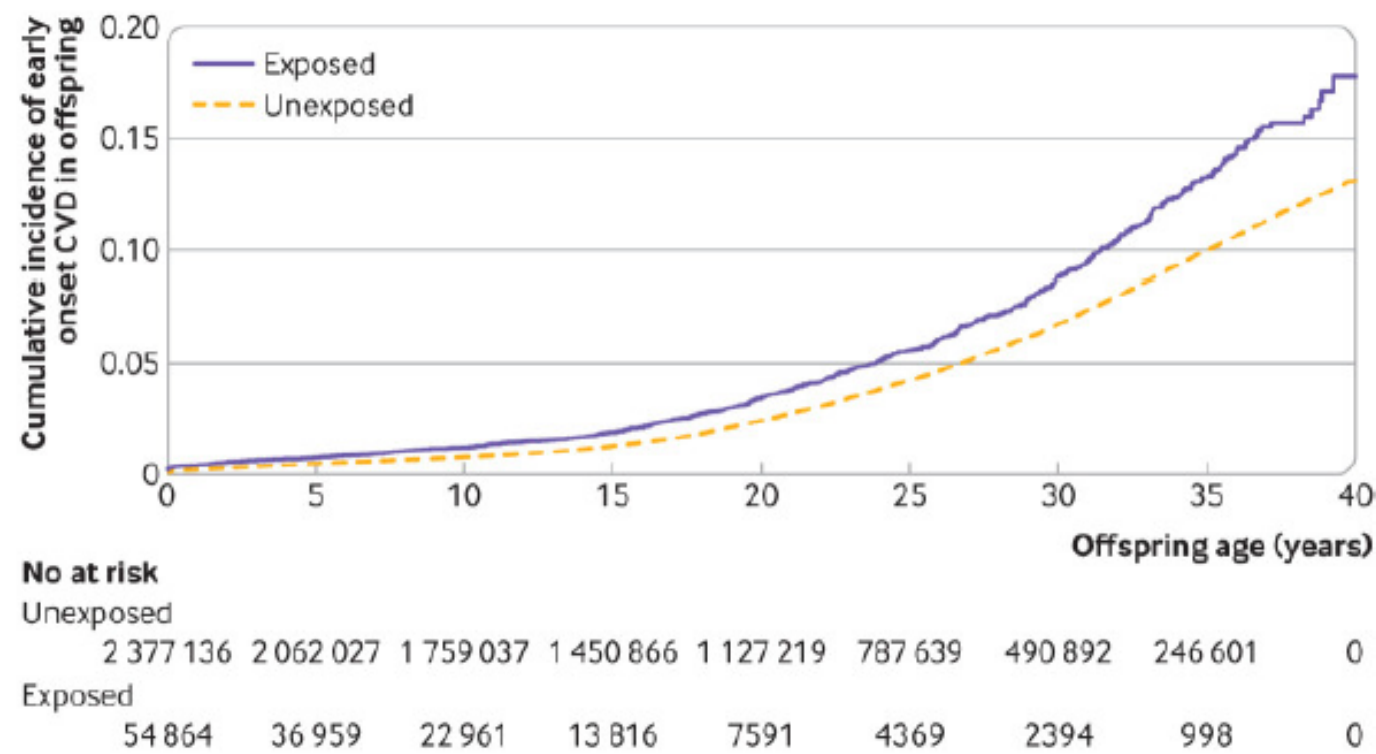


Fig. 1. This Forest plot shows that the five dichotomous measures of child adiposity at mean age of 11.4 years are significantly associated with GDM and the associations are strongest for obesity alone and sum of skinfolds

Maternal diabetes during pregnancy and early onset of cardiovascular disease in offspring: population based cohort study with 40 years of follow-up



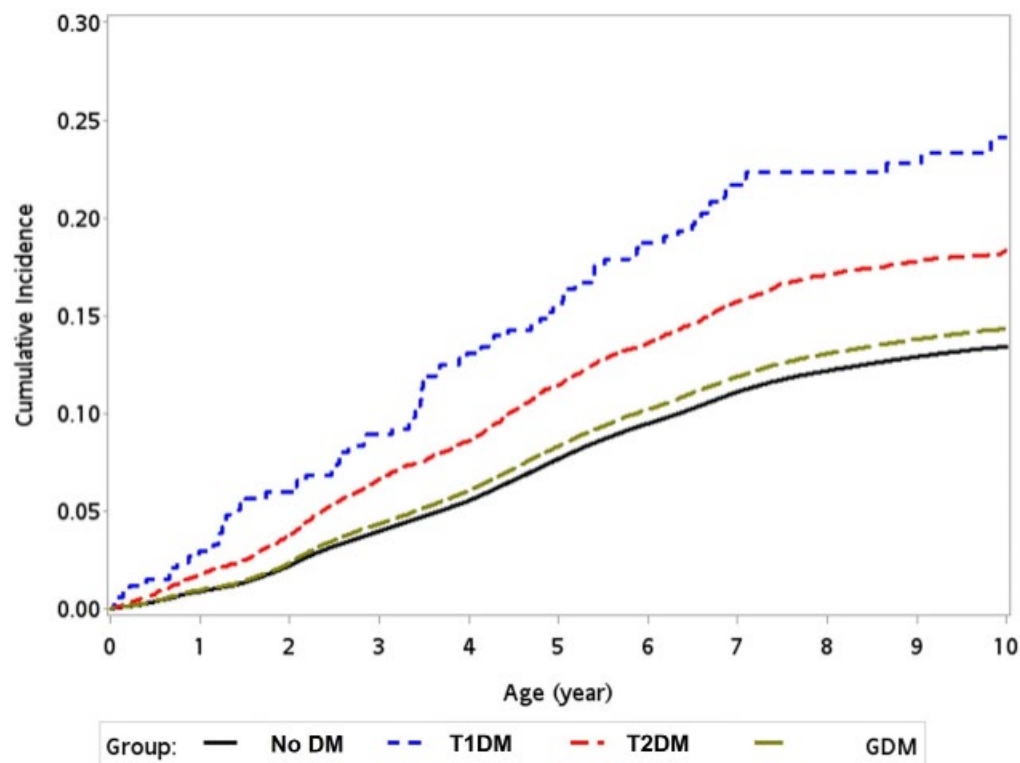
	RR
Insufficienza cardiaca	1,45
Ipertensione	1,78
TVP	1,82
Embolia polmonare	1,91

Incidenza più alta nei figli di madre diabetiche complicate
Incidenza a 40 anni di età 29% (figli di diabetiche) vs 13% (figli di non diabetiche)

DIABETE e AUTISMO

Childhood neurodevelopmental disorders and maternal diabetes:
A population-based cohort study

Dev Med Child Neurol. 2023;65:933–941.



Diabetes in Pregnancy for Mothers and Offspring:
Reflection on 30 Years of Clinical
and Translational Research:
The 2022 Norbert Freinkel
Award Lecture

Diabetes Care 2023;46:482–489 | <https://doi.org/10.2337/dci22-0055>



ASD autism spectrum disease



2021

Systematic Review

Risk of type 2 diabetes mellitus after gestational diabetes mellitus: A systematic review & meta-analysis

Huaxuan You^{1,2}, Juan Hu^{1,3}, Ying Liu⁵, Biru Luo^{1,4}, Anjiang Lei^{1,2}

1809 pubblicazioni

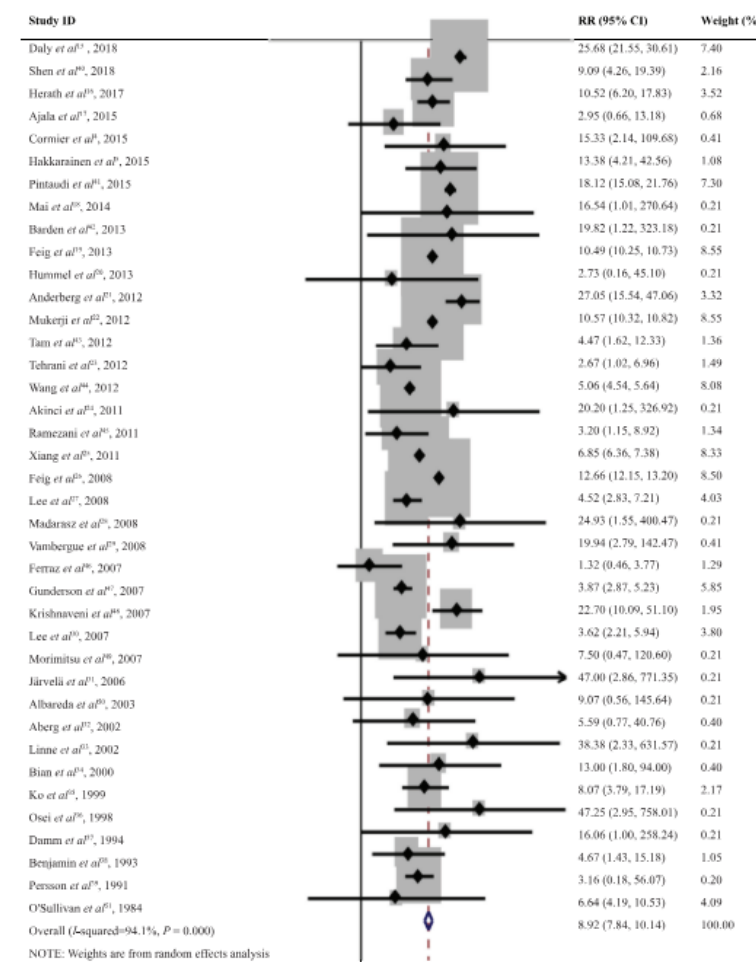
2847596 donne

78893 con T2DM dopo 6 o più settimane dal parto

RR 1,32 – 47,2

RR medio 8,9

Donne > 40 anni, con familiarità per diabete, di colore, bianche non –ispaniche, europee e asiatiche hanno un rischio maggiore



ACOG PRACTICE BULLETIN

Clinical Management Guidelines for Obstetrician–Gynecologists

NUMBER 190, FEBRUARY 2018

(Replaces Practice Bulletin Number 180, July 2017)

Gestational Diabetes Mellitus



Diabetes in pregnancy: management from preconception to the postnatal period

ACOG 2018	NICE 2020
Monitoraggio glicemico 4 volte/die 1 basale + 3 postprandiali (a 1 o 2h)	Monitoraggio glicemico 4 volte/die 1 basale + 3 postprandiali
Dieta : 33-40% di carboidrati, 20% proteine e 40% grassi	Dieta con alimenti a basso indice calorico
Terapia insulinica (I scelta) Metformina (II scelta)	Terapia con metformina (I scelta) Insulina (II scelta o complementare a metformina)
OGTT 75 g 4-12 sett dopo il parto (da 1 a 3 anni)	Glicemia basale dopo 6-13 sett Non OGTT 75 g routinaria HBA1c annuale

ACOG PRACTICE BULLETIN

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Diabetes in pregnancy: management from preconception to the postnatal period



ACOG 2018

Ecografia per biometria

- Una volta nel III trimestre
- In prossimità del termine

DIABETE COMPENSATO

- Parto 39-41 sett
- Nessun monitoraggio previsto

DIABETE SCOMPENSATO o IN TERAPIA

- Parto a 37-39 sett
- GDM in terapia ma compensato parto a 40 sg
- CTG + AFI a 32 sg 2 volte/settimana

NICE 2020

Ecografia per biometria

- 32 sett
- 36 sett

DIABETE COMPENSATO

- Parto 39-41 sett
- Test di benessere fetale, settimanali, dalla 38° sett

DIABETE SCOMPENSATO

- Parto a 37-39 sett
- Test di benessere fetale, settimanali, dalla 38° sett

TARGET EUGLICEMIA



Come utilizzare il diario

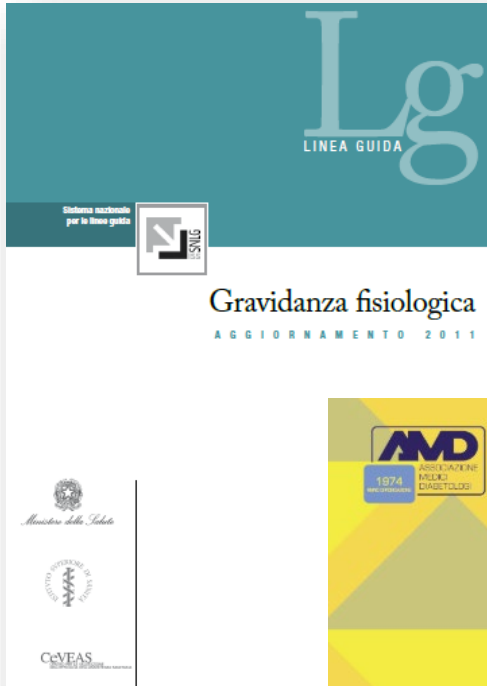
Giorno:
 Mese: febbraio
 Peso: 65 kg
 Pressione: 110 / 80

		GLICEMIA		GLICEMIA		GLICEMIA		ALTRE MISURAZIONI	
		al risveglio	1 ora dopo colazione	prima di pranzo	1 ora dopo pranzo	prima di cena	1 ora dopo cena	ora	valore
lun	12	105	120	97	135	108	138	2.00	92
mar	13	110	132	90	139	130	160	23.00	120
mer	14								
gio	15								

- Glicemia < 95 mg/dl a digiuno
- Glicemia < 140 mg/dl 1 ora dopo i pasti
- Glicemia < 120 mg/dl 2 ore dopo i pasti



MONITORAGGIO CLINICO



- Valutazione glicemie
- Monitoraggio peso e PA
- Esami LG gravidanza fisiologica
- TSH
- Vitamina D
- Supplementazione con Vitamina D e/o integratori multivitaminici

Controllo ogni 4 settimane

MONITORAGGIO FETALE

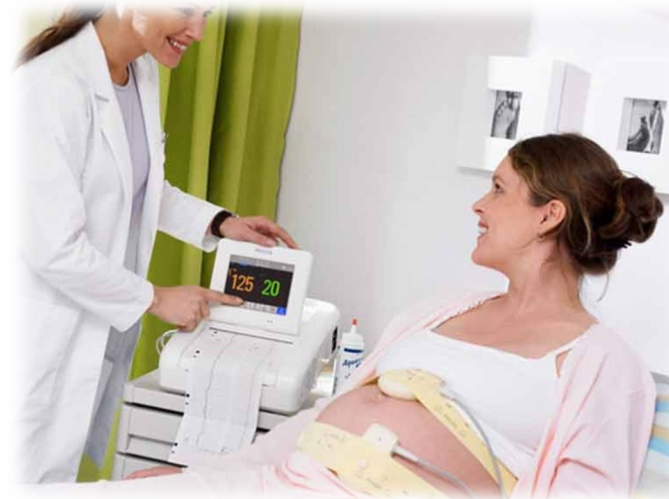
ECOGRAFIA

Biometria fetale ogni 2-4 settimane



CTG

Settimanale da 36 wk se GDM scompensato o terapia insulinica



MODALITA' E TIMING PARTO



INDUZIONE

- ✓ 40+6 sg se buon compenso e normosviluppo
- ✓ 38-39 sg se insulina e/o
CA > 90° centile e/o
scarso compenso glucidico
- ✓ Il diabete non è una controindicazione al
travaglio di prova dopo TC
- ✓ Indicato taglio cesareo elettivo se peso stimato >
4500 g



CARATTERISTICHE MATERNE 2014 – 2022

	N = 1250	(%)
Caucasiche	791	63,2
Non - caucasiche	459	36,8
Nullipare	519	41,5
Pre-TC	206	16,5
Pluripare	525	42

	N	%
ETA' MATERNA (aa)	34,2	
BMI ≥ 30	294	23,5
GDM progressivo	226/1024	22

OGTT 75 g

BASALE PATOLOGICO VS BASALE NORMALE

Caratteristiche materne	Basale patologico all'OGTT 75 g	Basale normale all'OGTT 75 g	P value
	741 (61%)	475 (39%)	
Non-caucasiche	44,1 %	26,7 %	< 0,0001
Età materna (media)	33,3 ± 11	33,8 ± 9,6	< 0,0001
Pregresso GDM	21,9 %	11 %	< 0,0001
Familiarità per diabete	37,4 %	29 %	0,0037
BMI pregestazionale	27,5 ± 6,1	24,4 ± 4,8	< 0,0001
BMI ≥ 30	30,4 %	12,2 %	< 0,0001
Nulliparità	35,3 %	52,4 %	< 0,0001
Glicemia basale > 100 nel I trimestre	21,2 %	4,2 %	< 0,0001



OUTCOME MATERNI

	Basale patologico all'OGTT 75 g	Basale normale all'OGTT 75 g	P value
Terapia insulinica	32,2 %	8,8 %	< 0,0001
Parto prematuro	8,2 %	4,6 %	0,015
Disturbi ipertensivi	0,3 %	0 %	ns
Travaglio indotto	60,5%	50,1 %	0,0016
Parti vaginali	81,1 %	90 %	0,0003
Taglio cesareo urgente	15,1 %	7,3 %	0,0002
Taglio cesareo elettivo	21,4 %	16,4 %	0,03



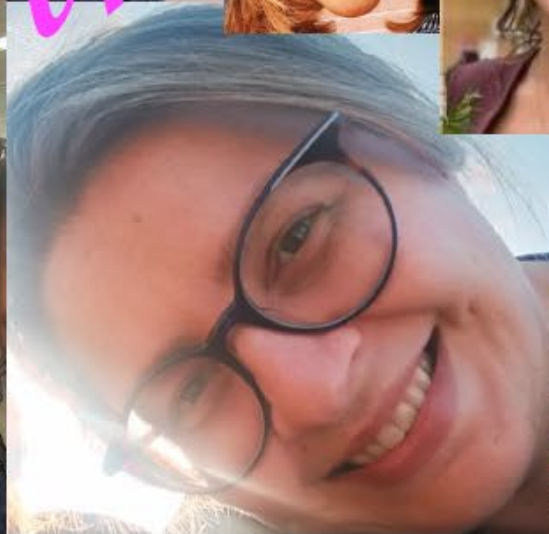
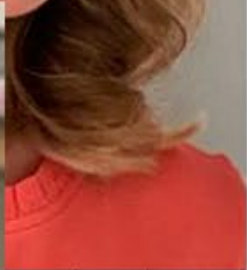
OUTCOME NEONATALI

	Basale patologico all'OGTT 75 g	Basale normale all'OGTT 75 g	P value
EG al parto	38,5 ± 1,3	38,6 ± 1,2	ns
Peso alla nascita	3232 ± 509	3172 ± 480	0,04
LGA	13,6 %	7,4 %	0,0007
Ipoglicemia neonatale	5,9 %	6,1 %	ns
Ittero	13,8 %	12,2 %	ns
Policitemia	0,4 %	0,4 %	ns
Distress respiratorio	8,6 %	6,9 %	ns



CONCLUSIONI

- L'incidenza del DG è sempre in aumento e si differenzia per etnia
- L'iperglicemia materna è associata ad outcome materno-feto-neonatali sfavorevoli a breve e lungo termine
- Il trattamento precoce del DG riduce incidenza degli outcome sfavorevoli
- Il monitoraggio clinico ed ecografico dovrebbe essere personalizzato anche in base al risultato della curva glicemica e alla presenza di patologie materne associate



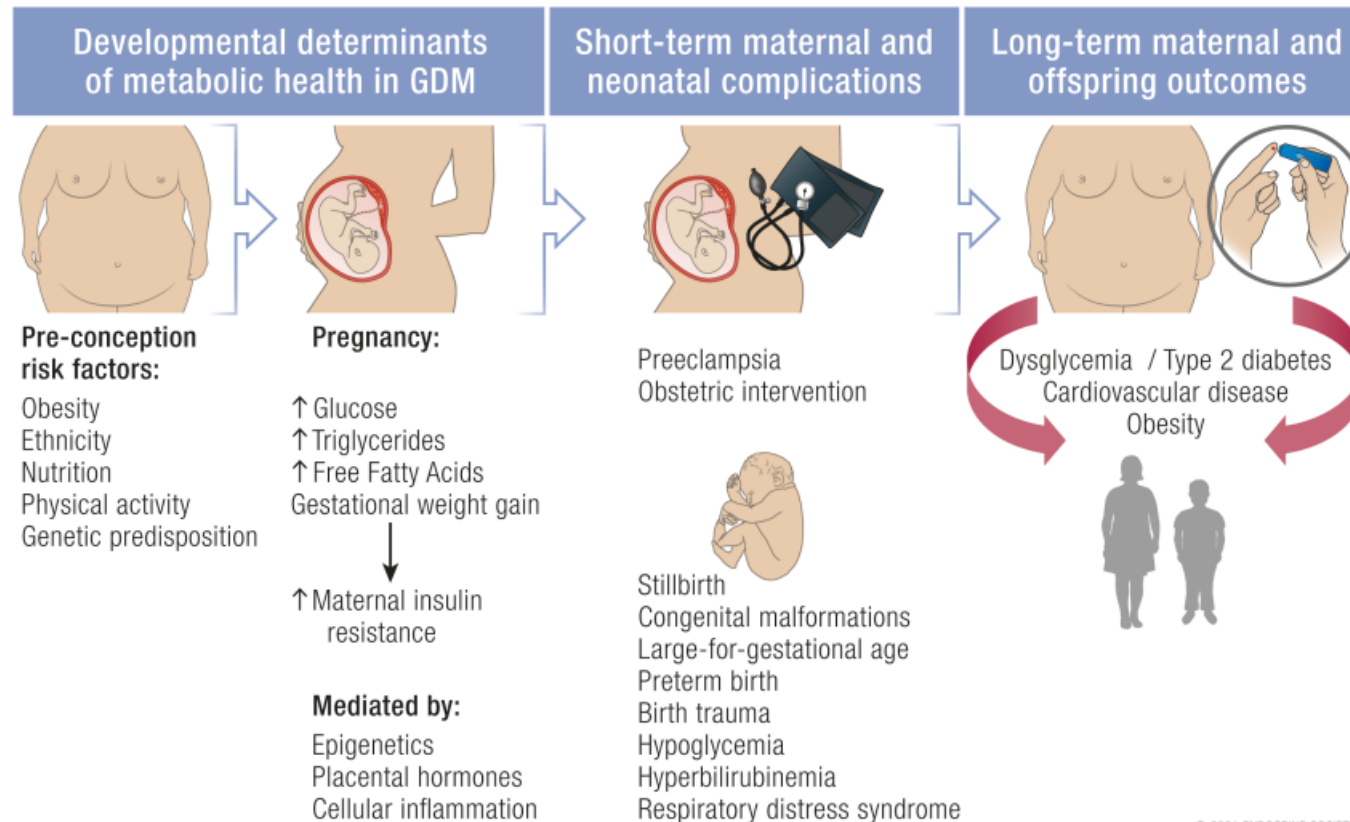
Thanks



GRAZIE!

A Clinical Update on Gestational Diabetes Mellitus

Graphical Abstract



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Key Words: gestational diabetes mellitus, diagnosis, pathophysiology, genetics, outcomes, management, precision medicine, biomarkers, diabetes prevention, COVID

Study protocol

Hyperglycaemia in early pregnancy: the Treatment of Booking Gestational diabetes Mellitus (TOBOGM) study. A randomised controlled trial

David Simmons , William M Hague, Helena J Teede, N Wah Cheung, Emily J Hibbert, Christopher J Nolan, Michael J Peek, Federico Girosi, Christopher T Cowell ... [See all authors](#) ▾

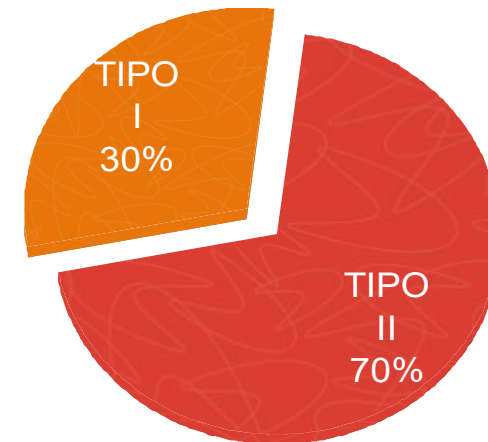
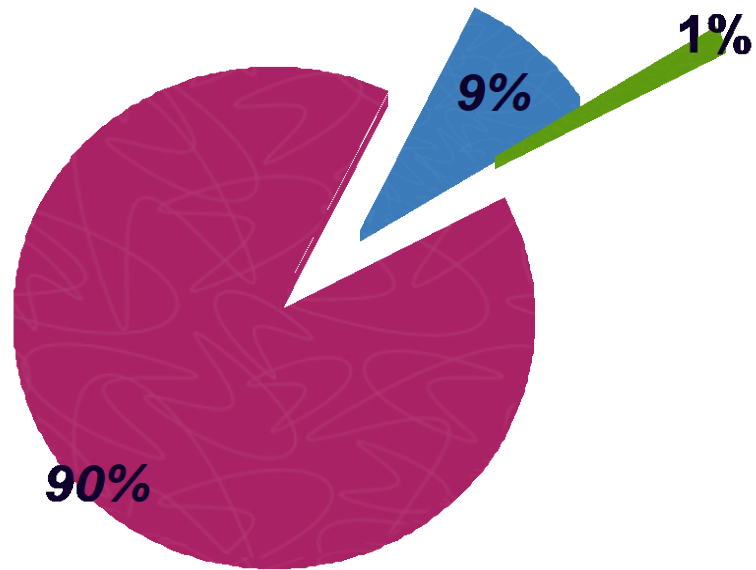
First published: 28 May 2018 | <https://doi.org/10.5694/mja17.01129> | Citations: 42

ORIGINAL ARTICLE | FEBRUARY 29 2024

Perinatal Outcomes in Early and Late Gestational Diabetes Mellitus After Treatment From 24-28 Weeks' Gestation: A TOBOGM Secondary Analysis

INCIDENZA

- NO DIABETE
- DIABETE GESTAZIONALE
- DIABETE PREGESTAZIONALE



Hyperglycemia and Adverse Pregnancy Outcome (HAPO) Study:

Preeclampsia

Am J Obstet Gynecol. 2010 March ; 202(3): 255.e1–255.e7. doi:10.1016/j.ajog.2010.01.024.

Relationship between maternal BMI and preeclampsia.

BMI (kg/m ²)	N	#	%	Model I OR	95% CI	Model II OR	95% CI	Model III [*] OR	95% CI
<= 23.2	3,917	81	2.1	1.00		1.00		1.00	
23.3–26.7	7,136	205	2.9	1.33	(1.02–1.73)	1.34	(1.03–1.75)	1.23	(0.94–1.62)
26.8–30.5	5,684	273	4.8	2.06	(1.60–2.67)	2.13	(1.63–2.77)	1.75	(1.33–2.30)
30.6–33.6	2,378	195	8.2	3.47	(2.64–4.56)	3.60	(2.72–4.78)	2.61	(1.94–3.52)
33.7–38.3	1,552	188	12.1	5.17	(3.92–6.82)	5.38	(4.02–7.18)	3.52	(2.58–4.80)
38.4–44.0	539	126	23.4	10.00	(7.34–13.64)	10.17	(7.33–14.11)	5.94	(4.17–8.46)
> 44.0	158	48	30.4	14.11	(9.26–21.50)	14.50	(9.29–22.65)	8.35	(5.22–13.36)
Continuous ^{**}	21,364	1,116	5.2	1.82	(1.72–1.92)	1.83	(1.73–1.95)	1.60	(1.50–1.71)

Relationship between maternal fasting C-peptide and preeclampsia.

Fasting C-peptide (ug/L)	N	#	%	Model I OR	95% CI	Model II OR	95% CI	Model III OR	95% CI
<= 1.2	4,546	79	1.7	1.00		1.00		1.00	
1.3–1.7	6,648	230	3.5	1.88	(1.45–2.45)	1.54	(1.18–2.01)	1.49	(1.14–1.95)
1.8–2.3	5,297	259	4.9	2.54	(1.95–3.30)	1.71	(1.31–2.24)	1.61	(1.22–2.12)
2.4–2.8	2,299	169	7.4	3.82	(2.89–5.05)	2.14	(1.59–2.88)	1.97	(1.45–2.67)
2.9–3.7	1,631	209	12.8	6.44	(4.89–8.48)	3.07	(2.28–4.14)	2.76	(2.02–3.78)
3.8–4.7	525	113	21.5	11.69	(8.51–16.06)	4.34	(3.05–6.19)	3.77	(2.59–5.49)
>= 4.8	195	33	16.9	9.39	(6.00–14.71)	3.66	(2.23–5.99)	3.08	(1.84–5.16)
Continuous [*]	21,141	1,092	5.2	1.61 ^{**}	(1.53, 1.69)	1.32 ^{**}	(1.25, 1.40)	1.28 ^{**}	(1.20, 1.36)

Relationship between maternal glucose and preeclampsia.

PG (mg/dl)	N	#	%	Model I OR	95% CI	Model II OR	95% CI	Model III [*] OR	95% CI
Fasting									
< 75	3,876	122	3.1	1.00		1.00		1.00	
75–79	7,065	252	3.6	0.99	(0.79–1.24)	0.83	(0.66–1.05)	0.76	(0.60–0.96)
80–84	5,624	271	4.8	1.25	(1.00–1.56)	0.94	(0.74–1.18)	0.77	(0.61–0.99)
85–89	2,455	188	7.7	1.93	(1.52–2.46)	1.31	(1.01–1.68)	1.01	(0.78–1.32)
90–94	1,604	184	11.5	2.90	(2.27–3.71)	1.69	(1.30–2.20)	1.21	(0.91–1.60)
95–99	558	67	12.0	2.90	(2.10–4.00)	1.41	(1.00–2.00)	0.92	(0.63–1.33)
> = 100	182	32	17.6	4.72	(3.05–7.30)	2.13	(1.33–3.44)	1.28	(0.78–2.10)
Continuous ^{**}	21,364	1,116	5.2	1.47	(1.39–1.56)	1.21	(1.14–1.30)	1.08	(1.00–1.16)
1-hour									
< 105	3,961	130	3.3	1.00		1.00		1.00	
106–132	6,991	294	4.2	1.34	(1.08–1.66)	1.20	(0.96–1.49)	1.16	(0.93–1.45)
133–155	5,492	340	6.2	2.10	(1.70–2.59)	1.74	(1.40–2.17)	1.56	(1.24–1.95)
156–171	2,489	163	6.5	2.26	(1.77–2.88)	1.85	(1.43–2.39)	1.61	(1.24–2.09)
172–193	1,654	128	7.7	2.78	(2.15–3.60)	2.08	(1.58–2.74)	1.71	(1.29–2.27)
194–211	570	45	7.9	2.82	(1.97–4.05)	2.10	(1.43–3.08)	1.60	(1.08–2.36)
>= 212	207	16	7.7	2.94	(1.69–5.11)	2.33	(1.31–4.17)	1.62	(0.88–2.97)
Continuous ^{**}	21,364	1,116	5.2	1.39	(1.30–1.47)	1.29	(1.20–1.38)	1.19	(1.11–1.28)
2-hour									
<= 90	4,036	147	3.6	1.00		1.00		1.00	
91–108	6,879	295	4.3	1.24	(1.01–1.52)	1.09	(0.88–1.35)	1.03	(0.83–1.27)
109–125	5,381	302	5.6	1.69	(1.38–2.08)	1.44	(1.16–1.78)	1.29	(1.04–1.61)
126–139	2,721	193	7.1	2.28	(1.82–2.86)	1.79	(1.41–2.28)	1.55	(1.21–1.98)
140–157	1,545	110	7.1	2.37	(1.82–3.08)	1.93	(1.46–2.55)	1.62	(1.22–2.15)
158–177	608	52	8.6	2.74	(1.96–3.84)	2.16	(1.50–3.10)	1.72	(1.19–2.49)
>= 178	194	17	8.8	2.91	(1.70–4.99)	2.75	(1.57–4.83)	2.06	(1.16–3.65)

Maternal diabetes during pregnancy and early onset of cardiovascular disease in offspring: population based cohort study with 40 years of follow-up

During up to 40 years of follow-up, 1153 offspring of mothers with diabetes and 91 311 offspring of mothers who did not have diabetes were diagnosed with CVD. Offspring of mothers with diabetes had a 29% increased overall rate of early onset CVD (hazard ratio 1.29 (95% confidence interval 1.21 to 1.37); cumulative incidence among offspring unexposed to maternal diabetes at 40 years of age 13.07% (12.92% to 13.21%), difference in cumulative incidence between exposed and unexposed offspring 4.72% (2.37% to 7.06%)). The sibship design yielded results similar to those of the unpaired design based on the whole cohort. Both pregestational diabetes (1.34 (1.25 to 1.43)) and gestational diabetes (1.19 (1.07 to 1.32)) were associated with increased rates of CVD in offspring. We also observed varied increased rates of specific early onset CVDs, particularly heart failure (1.45 (0.89 to 2.35)), hypertensive disease (1.78 (1.50 to 2.11)), deep vein thrombosis (1.82 (1.38 to 2.41)), and pulmonary embolism (1.91 (1.31 to 2.80)). Increased rates of CVD were seen in different age groups from childhood to early adulthood until age 40 years. The increased rates were more pronounced among offspring of mothers with diabetic complications (1.60 (1.25 to 2.05)). A higher incidence of early onset CVD in offspring of mothers with diabetes and comorbid CVD (1.73 (1.36 to 2.20)) was associated with the added influence of comorbid CVD but not due to the interaction between diabetes and CVD on the multiplicative scale (P value for interaction 0.94).

All 2 432 000 liveborn children without congenital heart disease in Denmark during 1977-2016. Follow-up began at birth and continued until first time diagnosis of CVD, death, emigration, or 31 December 2016, whichever came first.

Exposures for observational studies

Pregestational diabetes, including type 1 diabetes (n=22 055) and type 2 diabetes (n=6537), and gestational diabetes (n=26 272).

Maternal diabetes and childhood cancer risks in offspring: two population-based studies

BACKGROUND: The effect of maternal diabetes on childhood cancer has not been widely studied.

METHODS: We examined this in two population-based studies in Denmark ($N = 6420$ cancer cases, 160,484 controls) and Taiwan ($N = 2160$ cancer cases, 2,076,877 non-cases) using logistic regression and Cox proportional hazard regression adjusted for birth year, child's sex, maternal age and birth order.

RESULTS: Gestational diabetes in Denmark [odds ratio (OR) = 0.98, 95% confidence interval (CI): 0.71–1.35] or type II and gestational diabetes in Taiwan (type II: hazard ratio (HR) = 0.81, 95% CI: 0.63–1.05; gestational diabetes: HR = 1.06, 95% CI: 0.92–1.22) were not associated with cancer (all types combined). In Denmark, maternal type I diabetes was associated with the risk of glioma (OR = 2.33, 95% CI: 1.04–5.22), while in Taiwan, the risks of glioma (HR = 1.59, 95% CI: 1.01–2.50) were elevated among children whose mothers had gestational diabetes. There was a twofold increased risk for hepatoblastoma with maternal type II diabetes (HR = 2.02, 95% CI: 1.02–4.00).

CONCLUSIONS: Our results suggest that maternal diabetes is an important risk factor for certain types of childhood cancers, emphasising the need for effective interventions targeting maternal diabetes to prevent serious health effects in offspring.

British Journal of Cancer (2022) 127:1837–1842; <https://doi.org/10.1038/s41416-022-01961-w>

**The first International Association of Diabetes and
Pregnancy Study Groups summit on the diagnosis of
gestational diabetes in early pregnancy: TOBOGM
Summit Report**

Treatment of Gestational Diabetes Mellitus Diagnosed Early in Pregnancy

N ENGL J MED 388;23 NEJM.ORG JUNE 8, 2023

Table 2. Primary and Secondary Pregnancy Outcomes.*

Outcome	Immediate Treatment (N = 400)	Control (N = 393)	Adjusted Treatment Effect†	
			Difference in Value (95% CI)	Relative Risk (95% CI)
Primary Pregnancy Outcomes				
Adverse neonatal outcomes — no./total no. (%)‡	94/378 (24.9)	113/370 (30.5)	−5.6 (−10.1 to −1.2)	0.82 (0.68 to 0.98)
Pregnancy-related hypertension — no./total no. (%)§	40/378 (10.6)	37/372 (9.9)	0.7 (−1.6 to 2.9)	1.08 (0.85 to 1.38)
Maternal Secondary Pregnancy Outcomes¶				
Median maternal gestational weight gain from first to final predelivery visit (IQR) — kg	6.0 (2.0 to 9.5)	6.9 (3.4 to 10.0)	−1.2 (−3.2 to 0.8)	NA
Cesarean delivery — no./total no. (%)	144/377 (38.2)	146/368 (39.7)	0.2 (−4.2 to 4.6)	1.00 (0.90 to 1.13)
Induction of labor — no./total no. (%)	187/377 (49.6)	177/372 (47.6)	1.0 (−8.3 to 10.3)	1.02 (0.84 to 1.23)
Perineal injury — no./total no. (%)	3/375 (0.8)	13/365 (3.6)	−2.8 (−4.1 to −1.5)	0.23 (0.10 to 0.51)
Median EQ-5D score at 24 to 28 wk of gestation (IQR)	0.83 (0.76 to 1.00)	0.81 (0.73 to 1.00)	0.02 (0.01 to 0.04)	1.03 (1.01 to 1.04)
Neonatal Secondary Pregnancy Outcomes**				
Neonatal lean body mass — kg	2.86±0.34	2.91±0.33	−0.04 (−0.09 to 0.02)	NA
Birth weight — g	3258±563	3343±588	−72.1 (−127.6 to −16.6)	NA
Large-for-gestational-age status — no./total no. (%)††	63/375 (16.8)	72/368 (19.6)	−4.6 (−11.8 to 2.5)	0.77 (0.51 to 1.17)
Small-for-gestational-age status — no./total no. (%)††	45/375 (12.0)	34/368 (9.2)	3.0 (−0.8 to 6.8)	1.32 (0.93 to 1.85)
Upper arm circumference — cm	10.8±1.4	10.9±1.3	−0.1 (−0.2 to 0.1)	NA
Sum of neonatal caliper measurements — mm	20.0±4.6	21.5±5.4	−1.4 (−2.2 to −0.5)	NA
Neonatal fat mass — kg	0.45±0.17	0.48±0.19	−0.03 (−0.05 to −0.01)	NA
Heel-prick blood glucose <29 mg/dl within 72 hr after birth	22/355 (6.2)	14/303 (4.6)	1.5 (−2.2 to 5.3)	1.31 (0.65 to 2.66)
Heel-prick blood glucose ≤40 mg/dl at 1 to 2 hr after birth	61/323 (18.9)	57/251 (22.7)	−4.2 (−13.4 to 5.0)	0.81 (0.55 to 1.19)
Median no. of bed days in neonatal special care nursery or neonatal ICU‡‡	2.0 (0.3 to 4.8)	2.0 (1.0 to 6.0)	−0.8 (−1.3 to −0.3)	0.60 (0.41 to 0.89)

Treatment of Gestational Diabetes Mellitus Diagnosed Early in Pregnancy

Table 3. Other Pregnancy Outcomes.*

Outcome	Immediate Treatment (N = 400)	Control (N = 393)	Adjusted Treatment Effect†	
			Difference in Value (95% CI)	Relative Risk (95% CI)
Components of Primary Adverse Neonatal Outcome				
Preterm birth — no./total no. (%)‡	28/377 (7.4)	31/369 (8.4)	−1 (−4 to 2)	0.89 (0.63 to 1.26)
Birth weight ≥4500 g — no./total no. (%)	2/377 (0.5)	6/369 (1.6)	NR	NR
Birth trauma — no./total no. (%)§	3/374 (0.8)	5/367 (1.4)	−0.4 (−1 to 0.2)	0.59 (0.24 to 1.43)
Neonatal respiratory distress — no./total no. (%)	37/376 (9.8)	62/365 (17.0)	−7 (−12 to −3)	0.57 (0.41 to 0.79)
Phototherapy — no./total no. (%)	44/374 (11.8)	42/358 (11.7)	0 (−1 to 1)	0.99 (0.87 to 1.13)
Stillbirth or neonatal death — no./total no. (%)	3/378 (0.8)	2/370 (0.5)	NR	NR
Shoulder dystocia — no./total no. (%)	11/374 (2.9)	11/367 (3.0)	−1 (−2 to 1)	0.77 (0.40 to 1.48)
Other maternal outcomes¶				
Emergency cesarean delivery — no./total no. (%)	71/377 (18.8)	74/368 (20.1)	1 (−4 to 5)	1.04 (0.86 to 1.27)
Elective cesarean delivery — no./total no. (%)	73/377 (19.4)	72/368 (19.6)	−0.5 (−6 to 5)	0.98 (0.76 to 1.25)
Preeclampsia — no./total no. (%)	13/378 (3.4)	9/371 (2.4)	1 (−0 to 2)	1.32 (0.90 to 1.94)
Gestational hypertension — no./total no. (%)	32/378 (8.5)	30/372 (8.1)	0.2 (−1 to 1)	1.03 (0.85 to 1.24)
Maternal blood pressure at admission to birth unit — mm Hg				
Systolic	121±15	121±14	1.0 (−1.0 to 2.9)	NA
Diastolic	75±10	75±10	0.5 (−1.1 to 2.1)	NA
Other Neonatal outcomes**				
Female sex — no./total no. (%)	179/377 (47.5)	180/368 (48.9)		NA
Weeks of gestation at birth	38.2±1.8	38.3±2.0	−0.1 (−0.3 to 0.2)	NA
Median birth-weight percentile (IQR)††	52 (27 to 81)	55 (30 to 85)	−3.0 (−7.9 to 0.1)	NA
Median Apgar score (IQR)				
At 1 min	9 (9 to 9)	9 (8 to 9)	0.3 (0.1 to 0.5)	NA
At 5 min	9 (9 to 9)	9 (9 to 9)	0.1 (0.0 to 0.2)	NA
First heel-prick mean blood glucose at any time — mg/dl	56±18	56±20	−0.1 (−0.2 to 0.2)	NA
Length — cm	49.5±2.9	49.9±3.2	−0.3 (−0.6 to 0.0)	NA
Head circumference — cm	34.4±2.3	34.5±1.8	−0.1 (−0.5 to 0.3)	NA
Abdominal circumference — cm	31.6±3.1	31.8±2.7	−0.3 (−0.7 to 0.1)	NA
Admission to neonatal special care nursery or neonatal ICU — no./total no. (%)	92/376 (24.5)	101/368 (27.4)	−3 (−7 to 0)	0.9 (0.73 to 1.07)

INTRAPARTUM GLUCOSE MANAGEMENT

DIABETE COMPENSATO

Ogni 4 ore

DIABETE SCOMPENSATO o IN TERAPIA

Ogni ora

Gestational Diabetes: Overview with Emphasis on Medical Management

Int. J. Environ. Res. Public Health **2020**, *17*, 9573; doi:10.3390/ijerph17249573

Induction of labor versus expectant management for gestational diabetes mellitus at term

Archives of Gynecology and Obstetrics (2019) 300:79–86
<https://doi.org/10.1007/s00404-019-05171-3>

Table 2 Pregnancy outcome of the induction and expectant management groups (2472)

Characteristics	37 weeks		38 weeks		39 weeks		40 weeks	
	Induction	Expectant	Induction	Expectant	Induction	Expectant	Induction	Expectant
<i>N</i>	102	2370	380	1759	219	1061	179	395
Epidural analgesia	75 (73.5)	1636 (69)	286 (75.3)	1200 (68.2)^{EE}	160 (73.1)	724 (68.2)	120 (67)	270 (68.4)
Meconium	8 (7.8)	190 (8)	9 (2.4)	169 (9.6)^{EEE}	21 (9.6)	123 (11.6)	20 (11.2)	55 (13.9)
Mode of delivery								
NVD	82 (80.4)	1793 (75.7)	286 (75.3)	1327 (75.4)	163 (74.4)	810 (76.3)	135 (75.4)	286 (72.4)
OVD	4 (3.9)	239 (10.1)^E	36 (9.5)	186 (10.6)	31 (14.2)	113 (10.7)	23 (12.8)	48 (12.2)
CS	16 (15.7)	338 (14.3)	58 (15.3)	246 (14)	25 (11.4)	138 (13)	21 (11.7)	61 (15.4)
TOLAC*	4 (3.9)	141 (5.9)	22 (5.8)	104 (5.9)	12 (5.5)	70 (6.6)	12 (6.7)	28 (7.1)
VBAC**	3 (2.9)	121 (5.1)	20 (5.3)	88 (5)	8 (3.7)	61 (5.7)	10 (5.6)	21 (5.3)
Indications for OVD								
NRFHM	4 (3.9)	76 (3.2)	11 (2.9)	63 (3.6)	13 (5.9)	42 (2)	11 (6.1)	17 (4.3)
PSS	(0)	162 (6.8)^{EE}	25 (6.6)	122 (6.9)	17 (7.8)	71 (6.7)	12 (6.7)	31 (7.8)
Indications for CS								
NRFHR	7 (6.9)	40 (1.7)^{EEE}	7 (1.8)	31 (1.8)	5 (2.3)	19 (1.8)	4 (2.2)	9 (2.3)
PFS	9 (8.8)	115 (4.9)	39 (10.3)	73 (4.2)^{EEE}	17 (7.8)	42 (4)^E	11 (6.1)	17 (4.3)
PSS	0 (0)	27 (1.1)	5 (1.3)	20 (1.1)	1 (0.5)	14 (1.3)	3 (1.7)	4 (1)
Macrosomia	0 (0)	83 (3.5)	3 (0.8)	72 (4.1)^{EE}	1 (0.5)	39 (3.7)^E	0 (0)	18 (4.6)^{EE}
Episiotomy***	12 (11.8)	414 (17.5)	49 (12.9)	336 (18.1)^{EE}	51 (23.3)	202 (19)	46 (25.7)	78 (19.7)
Minor perineal tear***	15 (14.7)	18.1)	51 (13.4)	329 (18.7)^E	33 (15.1)	208 (19.6)	23 (12.8)	74 (18.7)
Major perineal tear***	0 (0)	8 (0.3)	0 (0)	7 (0.4)	0 (0)	3 (0.3)	1 (0.6)	0 (0)
Shoulder dystocia***	1 (1)	8 (0.3)	1 (0.3)	7 (0.4)	2 (0.9)	5 (0.5)	1 (0.6)	2 (0.5)
PPH	3 (2.9)	50 (2.1)	11 (2.9)	33 (1.9)	2 (0.9)	25 (2.4)	5 (2.8)	13 (3.3)

Data are presented as mean ± SD or *n* (%)

NVD normal vaginal delivery, *OVD* operative vaginal delivery, *CS* cesarean section, *TOLAC* trial of labor after cesarean section, *VBAC* vaginal birth after cesarean section (successful TOLAC), *NRFHR* non-reassuring fetal heart rate, *PFS* prolonged first stage of labor, *PSS* prolonged second stage of labor, *Minor perineal tear* grade 1–2 perineal tear, *Major perineal tear* grade 3–4 perineal tear, *PPH* postpartum hemorrhage

^E*p* < 0.05, ^{EE}*p* < 0.01, ^{EEE}*p* < 0.001 for the difference between delivery and ongoing pregnancy groups. Appear in bold

*Percentage out of women with previous single cesarean delivery

**Percentage out of women with TOLAC

***Percentage out of NVD or OVD

Table 3 Neonatal outcomes in the induction and expectant management groups (2472)

Characteristics	37 weeks		38 weeks		39 weeks		40 weeks	
	Induction	Expectant	Induction	Expectant	Induction	Expectant	Induction	Expectant
<i>N</i>	102	2370	380	1759	219	1061	179	395
Birth weight, g	3062 ± 493	3319 ± 427^{EEE}	3244 ± 389	3354 ± 419^{EEE}	3324 ± 386	3387 ± 403^E	3393 ± 367	3444 ± 400
Birth weight percentile (%)	62.3 ± 30	62.4 ± 26.5	63.1 ± 25.7	61.6 ± 26.5	59.1 ± 26.6	60.5 ± 26	59 ± 25	61 ± 26
APD	0 (0)	2 (0.1)	0 (0)	1 (0.1)	0 (0)	1 (0.1)	1 (0.6)	0 (0)
IPD	0 (0)	1 (0)	0 (0)	1 (0.1)	1 (0.5)	0 (0)^E	0 (0)	0 (0)
LGA	20 (19.6)	414 (17.5)	60 (15.8)	297 (16.9)	29 (13.2)	164 (15.5)	22 (12.3)	67 (17)
BW > 4000 g	2 (2)	141 (5.9)	9 (2.4)	119 (6.8)^{EE}	10 (4.6)	77 (7.3)	9 (5)	41 (10.4)^E
BW > 4250 g	1 (1)	38 (1.6)	3 (0.8)	30 (1.7)	1 (0.5)	21 (2)	2 (1.1)	11 (2.8)
BW > 4500 g	0 (0)	9 (0.4)	0 (0)	6 (0.3)	0 (0)	4 (0.4)	0 (0)	3 (0.8)
Male neonate	55 (53.9)	1245 (52.5)	215 (56.6)	909 (51.7)	119 (54.3)	545 (51.4)	94 (52.5)	201 (50.9)
5-min Apgar score < 7	0 (0)	9 (0.4)	0 (0)	5 (0.3)	1 (0.5)	4 (0.4)	1 (0.6)	2 (0.5)
pH < 7.05	2 (2)	11 (0.5)^E	2 (0.5)	8 (0.5)	1 (0.5)	6 (0.6)	2 (1.1)	3 (0.8)
Clavicular fracture*	1 (1)	28 (1.2)	2 (0.5)	23 (1.3)	6 (2.7)	10 (0.9)^E	3 (1.7)	0 (0)^E
Erb's palsy*	0 (0)	3 (0.1)	1 (0.3)	2 (0.1)	1 (0.5)	1 (0.1)	0 (0)	1 (0.3)
NICU	16 (15.7)	170 (7.2)^{EE}	41 (10.8)	103 (5.9)^{EEE}	18 (8.3)	61 (5.8)	9 (5)	31 (7.9)
Asphyxia	1 (1)	20 (0.8)	4 (1.1)	10 (0.6)	2 (0.9)	8 (0.8)	2 (1.1)	5 (1.3)
Seizures	0 (0)	12 (0.5)	2 (0.5)	10 (0.6)	2 (0.9)	5 (0.5)	0 (0)	1 (1.3)
HIE	0 (0)	8 (0.3)	0 (0)	7 (0.4)	4 (1.8)	2 (0.2)^{EE}	1 (0.6)	0 (0)
Hypoglycemia	3 (2.9)	46 (1.9)	4 (1.1)	29 (1.6)	4 (1.8)	13 (1.2)	1 (0.6)	7 (1.8)
RDS	0 (0)	2 (0.1)	1 (0.3)	1 (0.1)	1 (0.5)	0 (0)^E	0 (0)	0 (0)
Sepsis	4 (3.9)	79 (3.3)	9 (2.4)	52 (3)	6 (2.7)	33 (3.1)	4 (2.2)	19 (4.8)
Mechanical ventilation	0 (0)	9 (0.4)	1 (0.3)	5 (0.3)	1 (0.5)	3 (0.3)	1 (0.6)	1 (0.3)
Meconium aspiration	0 (0)	2 (0.1)	0 (0)	1 (0.1)	0 (0)	1 (0.1)	0 (0)	1 (0.3)
Jaundice	19 (18.6)	238 (10)^{EE}	48 (12.6)	148 (8.4)^E	17 (7.8)	72 (6.8)	10 (5.6)	24 (6.1)
Phototherapy	15 (14.7)	165 (7)^{EE}	34 (8.9)	106 (6)^E	18 (8.2)	49 (4.6)^E	10 (5.6)	11 (2.8)
NND	0 (0)	1 (0.1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Composite neonatal outcome**	25 (24.5)	322 (13.6)^{EE}	53 (13.9)	216 (12.3)	33 (15.1)	118 (11.1)	21 (11.7)	43 (10.9)

Data are presented as mean ± SD or *n* (%)

APD antepartum fetal death, IPD intrapartum fetal death, LGA large for gestational age neonate (birth weight ≥ 90 percentile), NICU neonatal intensive care unit admission, HIE hemorrhagic ischemic encephalopathy, RDS respiratory distress syndrome, NND neonatal death

*Percentage out of NVD or OVD

**Composite neonatal outcome (≥ 1 of the following): shoulder dystocia, 5-min Apgar score < 7, asphyxia, seizures, HIE, pH < 7.05, hypoglycemia, RDS, sepsis, mechanical ventilation, phototherapy, clavicular fracture, Erb's palsy

^E*p* < 0.05, ^{EE}*p* < 0.01, ^{EEE}*p* < 0.001 for the difference between delivery and ongoing pregnancy groups. Appear in bold

Association of Gestational Diabetes With Subsequent Long-Term Risk of Mortality

Figure 2. Risk of Total and Cause-Specific Mortality by Gestational Diabetes Status Among the Nurses' Health Study II Participants

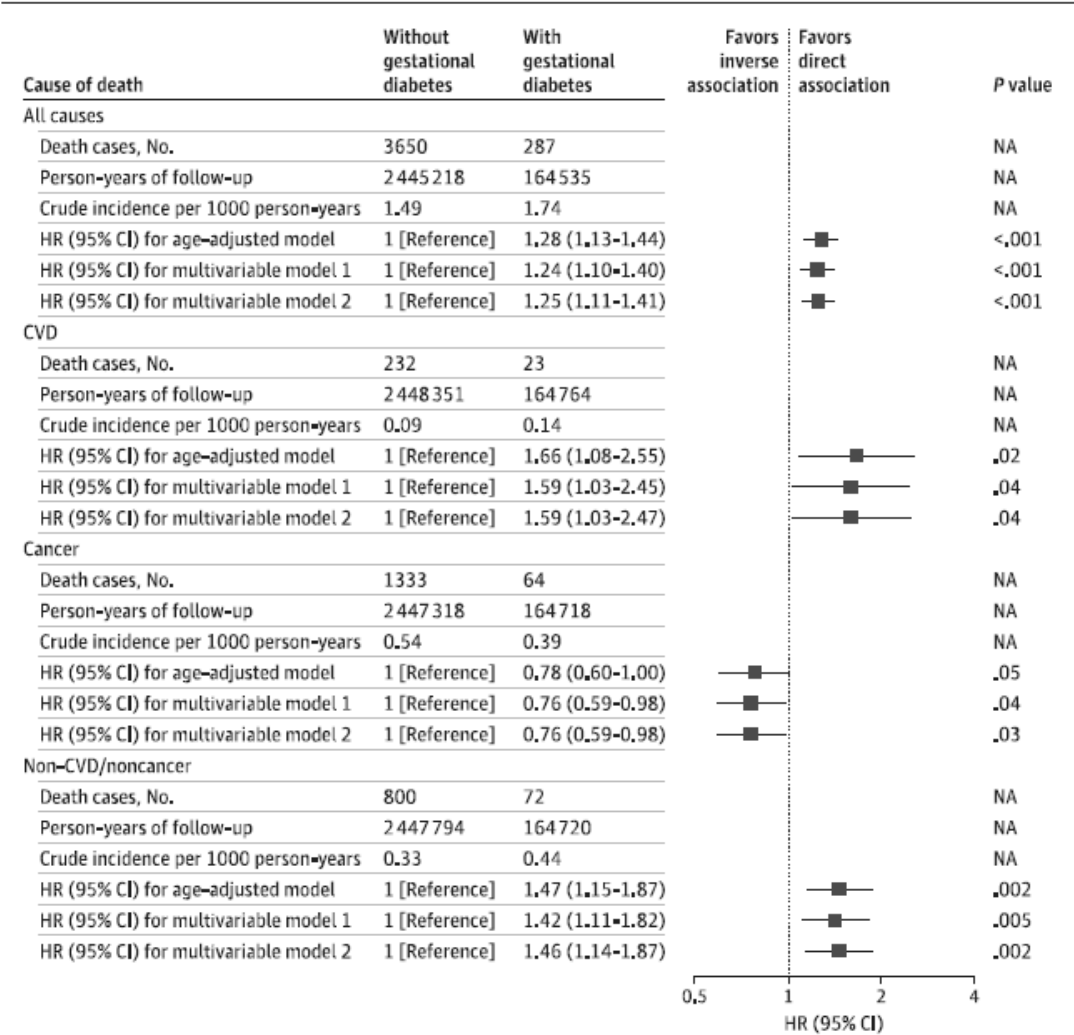


Table 3. Risk of Total Mortality Among Nurses' Health Study II Participants, Stratified by Lifestyle Factors and Chronic Diseases^{a,b}

Lifestyle factor and chronic disease	HR (95% CI)		RER (95% CI)	P value for additive interaction	P value for multiplicative interaction
	Without gestational diabetes	With gestational diabetes			
Diet quality					
Top 40% AHEI score (n = 1078 deaths)	1 [Reference]	1.07 (0.83 to 1.38)	0.32 (−0.04 to 0.67)	.08	.21
Bottom 60% AHEI score (n = 2859 deaths)	1 [Reference]	1.32 (1.15 to 1.52)			
Smoking status					
Never (n = 1976 deaths)	1 [Reference]	1.22 (1.03 to 1.45)	0.13 (−0.01 to 0.28)	.07	.91 ^c
Current or former: 1–19 cigarettes/d (n = 1445 deaths)	1 [Reference]	1.21 (0.98 to 1.50)			
Current or former: ≥20 cigarettes/d (n = 516 deaths)	1 [Reference]	1.40 (1.01 to 1.94)			
BMI					
<25 (n = 1509 Deaths)	1 [Reference]	1.01 (0.78 to 1.29)	0.36 (0.05 to 0.68)	.02	.04
≥25 (n = 2428 Deaths)	1 [Reference]	1.37 (1.19 to 1.58)			
Physical activity					
≥30 min/d (n = 762 Deaths)	1 [Reference]	1.07 (0.78 to 1.47)	0.30 (−0.09 to 0.69)	.13	.25
<30 min/d (n = 3175 Deaths)	1 [Reference]	1.31 (1.15 to 1.50)			
Alcohol intake					
5–15 g/d (n = 1498 Deaths)	1 [Reference]	1.11 (0.89 to 1.38)	0.31 (−0.04 to 0.65)	.08	.22
<5 or >15 g/d (n = 2439 Deaths)	1 [Reference]	1.31 (1.12 to 1.51)			
Depression					
No (n = 2875 deaths)	1 [Reference]	1.23 (1.06 to 1.42)	0.16 (−0.23 to 0.55)	.42	.66
Yes (n = 1062 deaths)	1 [Reference]	1.28 (1.03 to 1.59)			
Chronic hypertension					
No (n = 2135 deaths)	1 [Reference]	1.12 (0.93 to 1.35)	0.33 (−0.04 to 0.70)	.08	.23
Yes (n = 1802 deaths)	1 [Reference]	1.24 (1.05 to 1.46)			
Hypercholesterolemia					
No (n = 1928 deaths)	1 [Reference]	1.07 (0.87 to 1.31)	0.37 (0.06 to 0.67)	.02	.03
Yes (n = 2009 deaths)	1 [Reference]	1.35 (1.16 to 1.58)			
COPD					
No (n = 3813 deaths)	1 [Reference]	1.25 (1.11 to 1.42)	0.24 (−1.87 to 2.34)	.83	.94
Yes (n = 124 deaths)	1 [Reference]	1.14 (0.30 to 4.34)			
CVD					
No (n = 3610 deaths)	1 [Reference]	1.20 (1.05 to 1.36)	1.12 (−0.59 to 2.82)	.20	.50
Yes (n = 327 deaths)	1 [Reference]	1.52 (1 to 2.32)			

Immediate delivery or expectant management in gestational diabetes at term: the GINEXMAL randomised controlled trial

Table 2. Primary outcome of the study

Outcomes	Study arms		Induction versus expectant	
	Induction (n = 214)	Expectant (n = 211)	RR (95% CI)	P
Caesarean section, n (%)	27 (12.6)	25 (11.8)	1.06 (0.64–1.77)	0.81
Caesarean section or operative delivery, n (%)	45 (21.0)	47 (22.3)	0.94 (0.66–1.36)	0.76

Table 3. Maternal outcomes

Maternal outcomes	Study arms		Induction versus expectant	
	Induction (n = 214)	Expectant (n = 211)	RR (95% CI)	P
Assisted third stage of labor, n (%)	22 (10.3)	27 (12.8)	0.80 (0.47–1.36)	0.42
Perineum, n (%) [*]				
Intact	53 (37.3)	46 (35.1)	1.00	–
Grade I–II perineal tears	89 (62.7)	82 (62.6)	1.04 (0.76–1.42)	0.82
Grade III–IV perineal tears	0	3 (2.3)	Not estimable	0.12 ^{**}
Postpartum haemorrhage ^{***}	13 (6.1)	11 (5.2)	1.16 (0.53–2.54)	0.70
ICU admission	3 (1.4)	2 (0.9)	1.48 (0.25–8.76)	1.00 ^{**}

Table 4. Neonatal outcomes

Neonatal outcomes	Study arms		Induction versus expectant	
	Induction (n = 214)	Expectant (n = 211)	RR (95% CI)	P
Gestational age at birth >39 weeks, n (%) [*]	47 (22.0)	157 (74.4)	0.30 (0.23–0.38)	<0.001
Macrosomia, n (%) ^{**}	13 (6.1)	24 (11.4)	0.53 (0.28–1.02)	0.06
Apgar 1 of <7, n (%)	12 (5.6)	4 (1.9)	2.96 (0.97–9.03)	0.05
Apgar 5 of <7, n (%)	2 (0.94)	0	Not estimable	0.50 ^{***}
Shoulder dystocia, n (%)	3 (1.4)	1 (0.5)	2.96 (0.31–28.21)	0.62 ^{***}
Presence of biochemical hypoglycaemia, n (%)	6 (3.0)	8 (4.1)	0.74 (0.26–2.09)	0.60 ^{***}
Presence of hyperbilirubinaemia, n (%) ^{****}	20 (10.0)	8 (4.1)	2.46 (1.11–5.46)	0.03
Presence of respiratory distress, n (%)	3 (1.4)	2 (0.9)	1.48 (0.25–8.76)	1.00 ^{***}
NICU admission, n (%)	2 (0.9)	2 (0.9)	0.99 (1.14–6.94)	1.00 ^{***}

^{*}Based on the assumption that at 39 weeks of gestation the risk of expectant management exceeds that of delivery in women affected by GDM, as demonstrated by Rosenstein et al.¹⁷

^{**}Defined as a fetal birthweight of ≥4000 g.¹¹

^{***}Analysis carried out with Fisher's exact test.

^{****}Available for 397 newborns.

POLIDRAMNIOS

American Journal of Obstetrics and Gynecology (2006) 195, 848–50

Amniotic fluid index and birth weight: Is there a relationship in diabetics with poor glycemic control?

Correlazione polidramnios/macrosomia in diabete scompensato



Ultrasound Obstet Gynecol 2010; 36: 338–343

Influence of polyhydramnios on perinatal outcome in pregestational diabetic pregnancies

- Aumentato rischio di parto prematuro spontaneo e iatrogeno
- Indicativo di scarso compenso glucidico

