



Deseo de gestación en la transición a la menopausia

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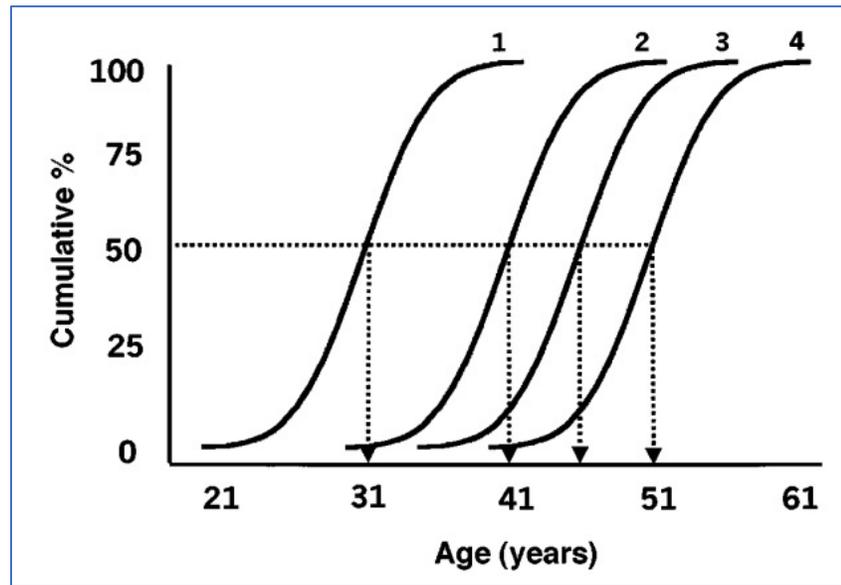
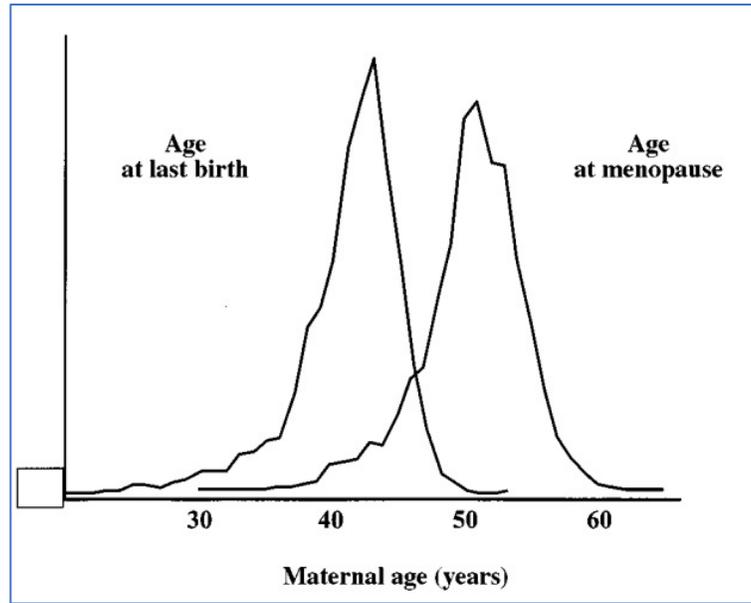
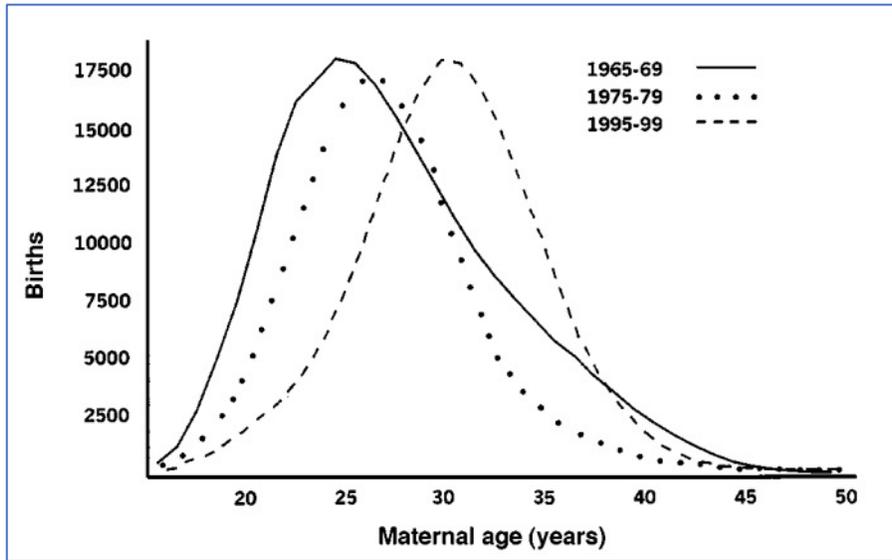


Deseo de gestación en la transición a la menopausia

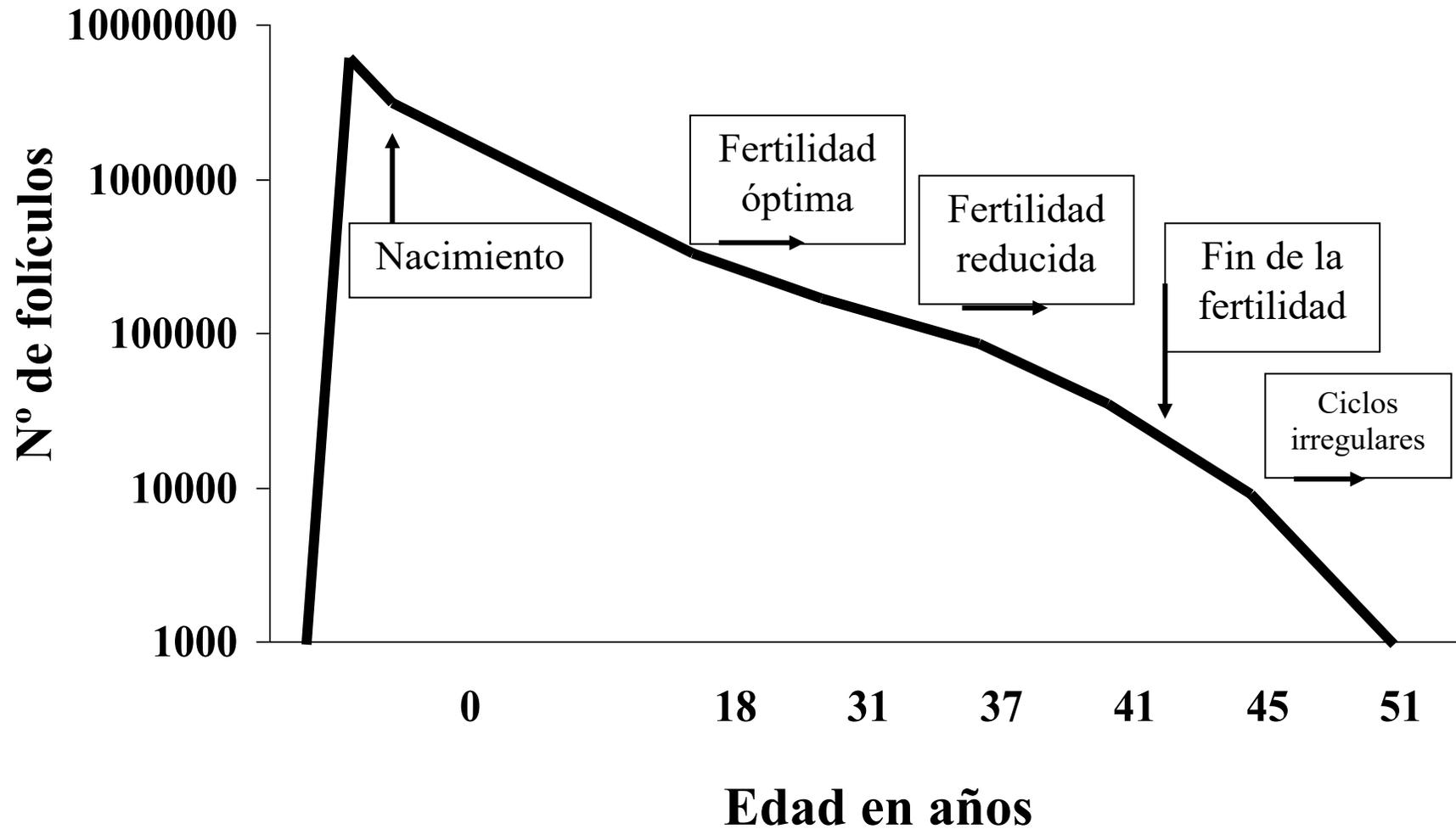
1. Fertilidad y transición a menopausia: fertilidad y hormonas
2. Reserva ovárica y calidad ovocitaria
3. Edad como factor determinante
4. Gestación en edad avanzada

ONLINE

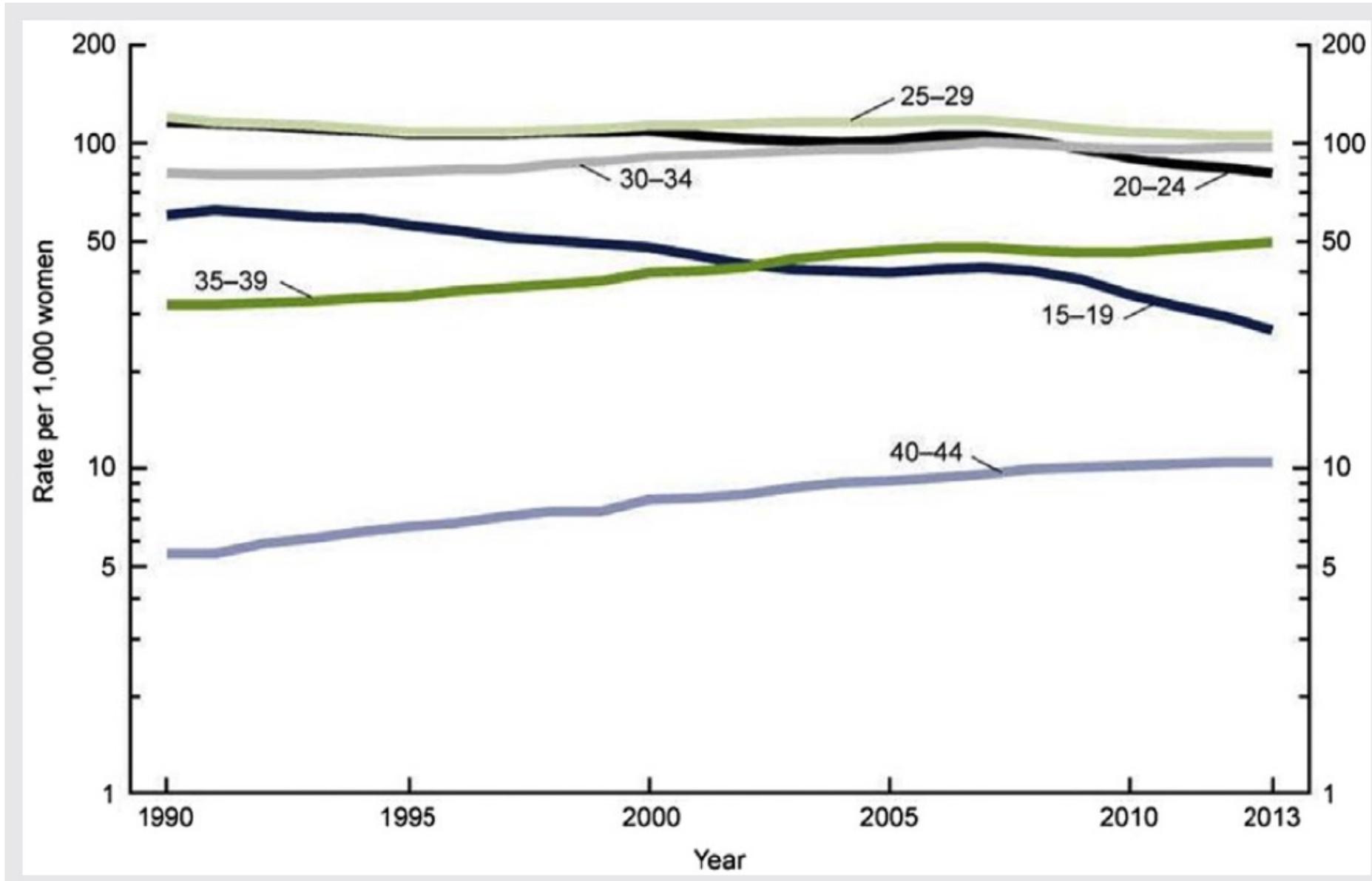
Edad y fertilidad - (Holanda)



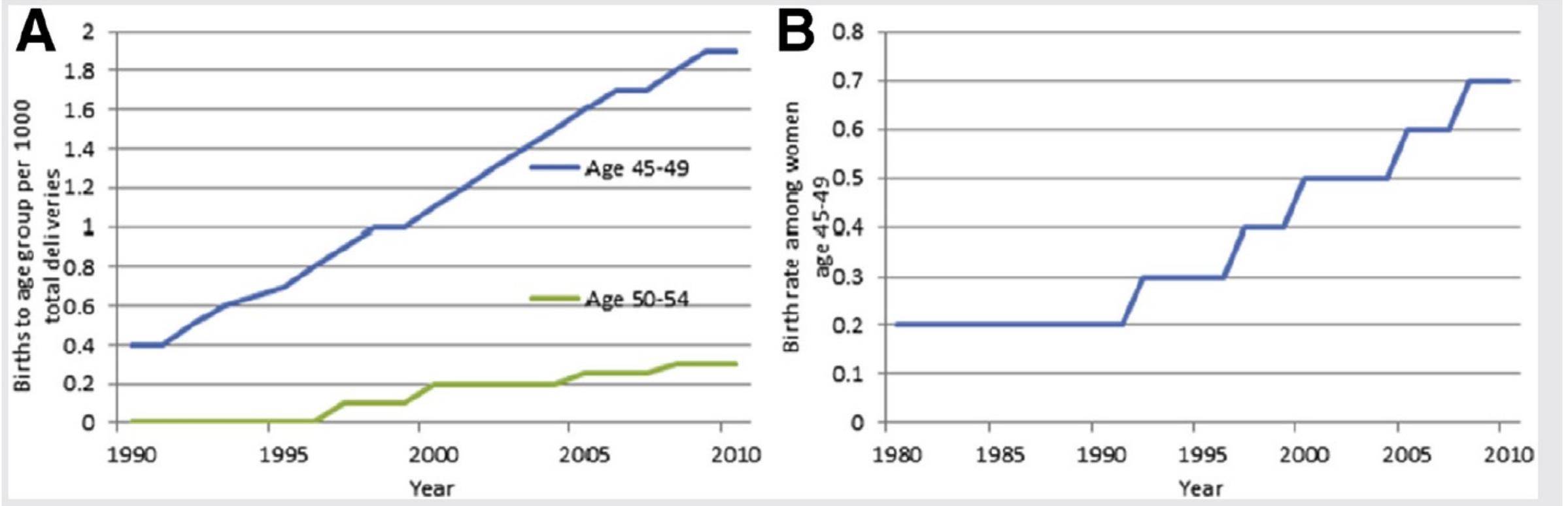
Etapas del comportamiento endocrino del ovario



Tasas de embarazo según edad materna



Número y tasa de nacimientos en madres ≥ 45 años en USA (vAMA)



(Sauer M Fertil Steril 2015; 103:1136)

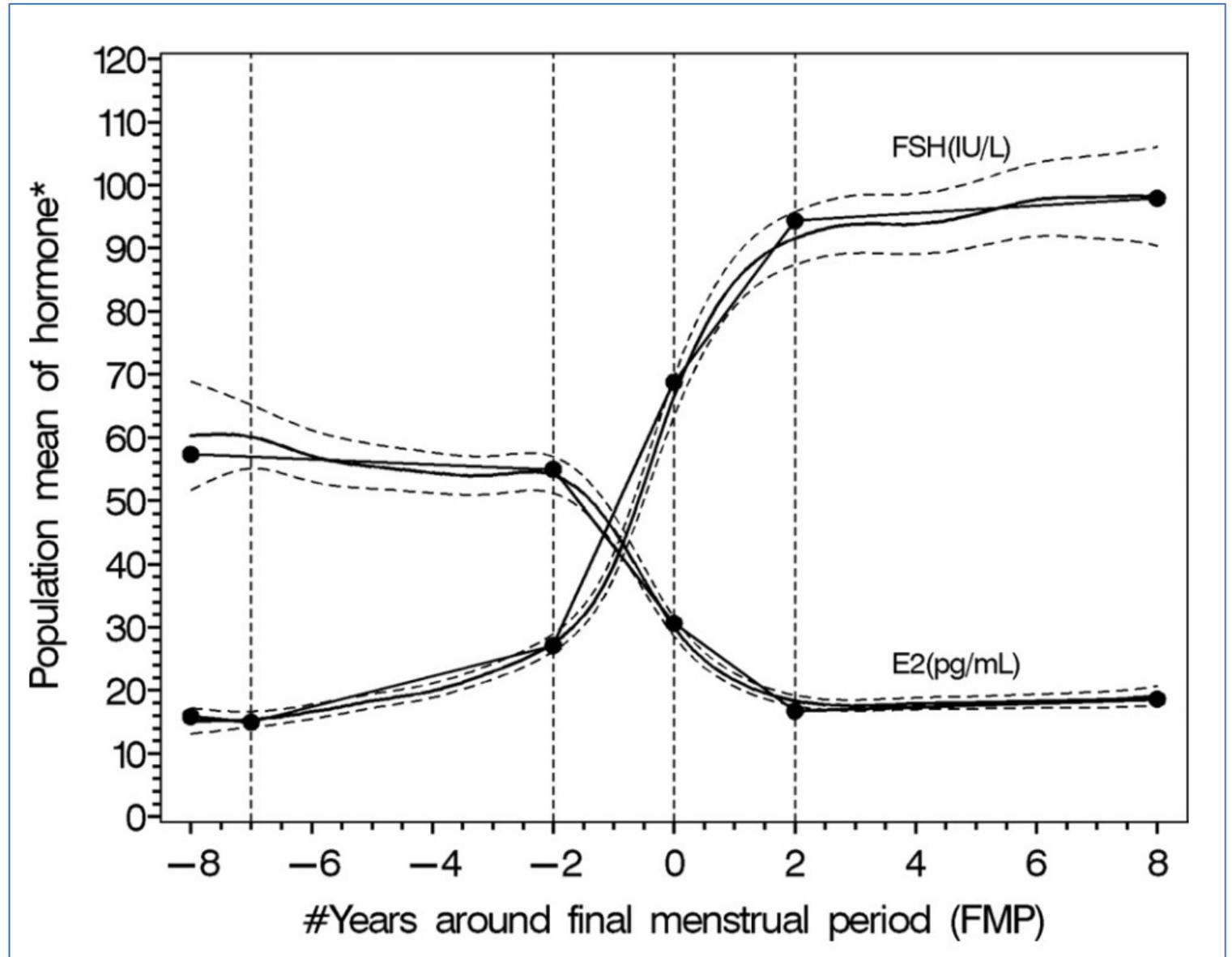
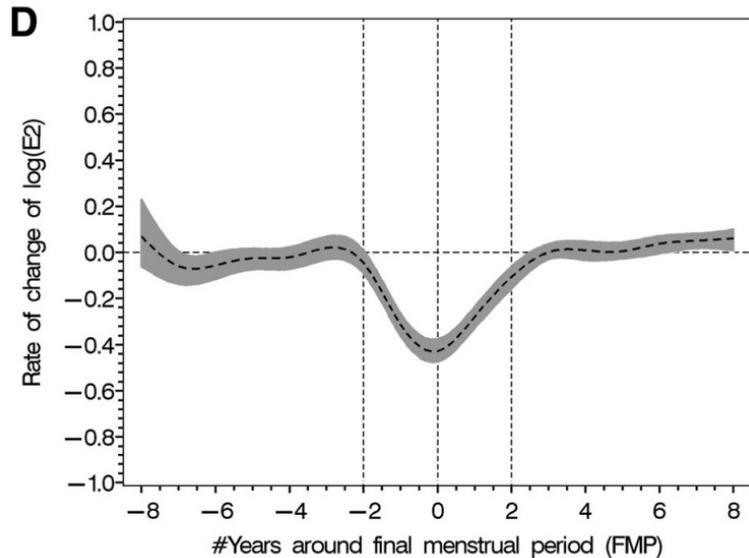
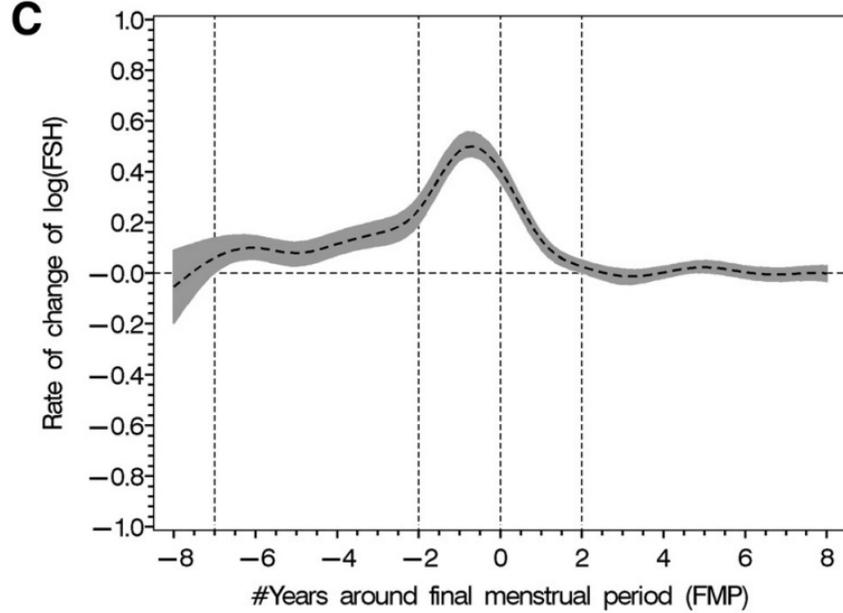
Transición a la menopausia

Stage	-5	-4	-3b	-3a	-2	-1	+1 a	+1b	+1c	+2
Terminology	REPRODUCTIVE				MENOPAUSAL TRANSITION		POSTMENOPAUSE			
	Early	Peak	Late		Early	Late	Early			Late
					Perimenopause					
Duration	variable				variable	1-3 years	2 years (1+1)	3-6 years	Remaining lifespan	
PRINCIPAL CRITERIA										
Menstrual Cycle	Variable to regular	Regular	Regular	Subtle changes in Flow/ Length	Variable Length Persistent ≥7- day difference in length of consecutive cycles	Interval of amenorrhea of ≥60 days				
SUPPORTIVE CRITERIA										
Endocrine FSH AMH Inhibin B			Low Low	Variable* Low Low	↑ Variable* Low Low	↑ >25 IU/L** Low Low	↑ Variable Low Low	Stabilizes Very Low Very Low		
Antral Follicle Count			Low	Low	Low	Low	Very Low	Very Low		
DESCRIPTIVE CHARACTERISTICS										
Symptoms						Vasomotor symptoms <i>Likely</i>	Vasomotor symptoms <i>Most Likely</i>		<i>Increasing symptoms of urogenital atrophy</i>	

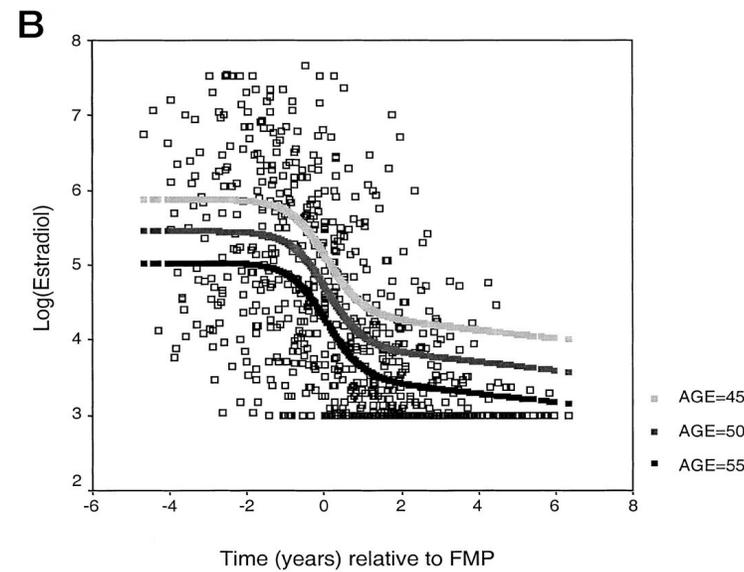
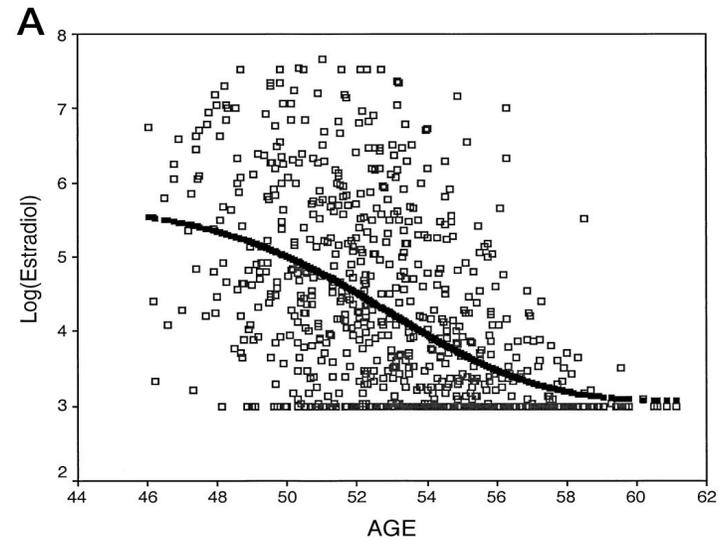
* Blood draw on cycle days 2-5 ↑ = elevated

**Approximate expected level based on assays using current international pituitary standard⁶⁷⁻⁶⁹

Transición a la menopausia (estudio SWAN)



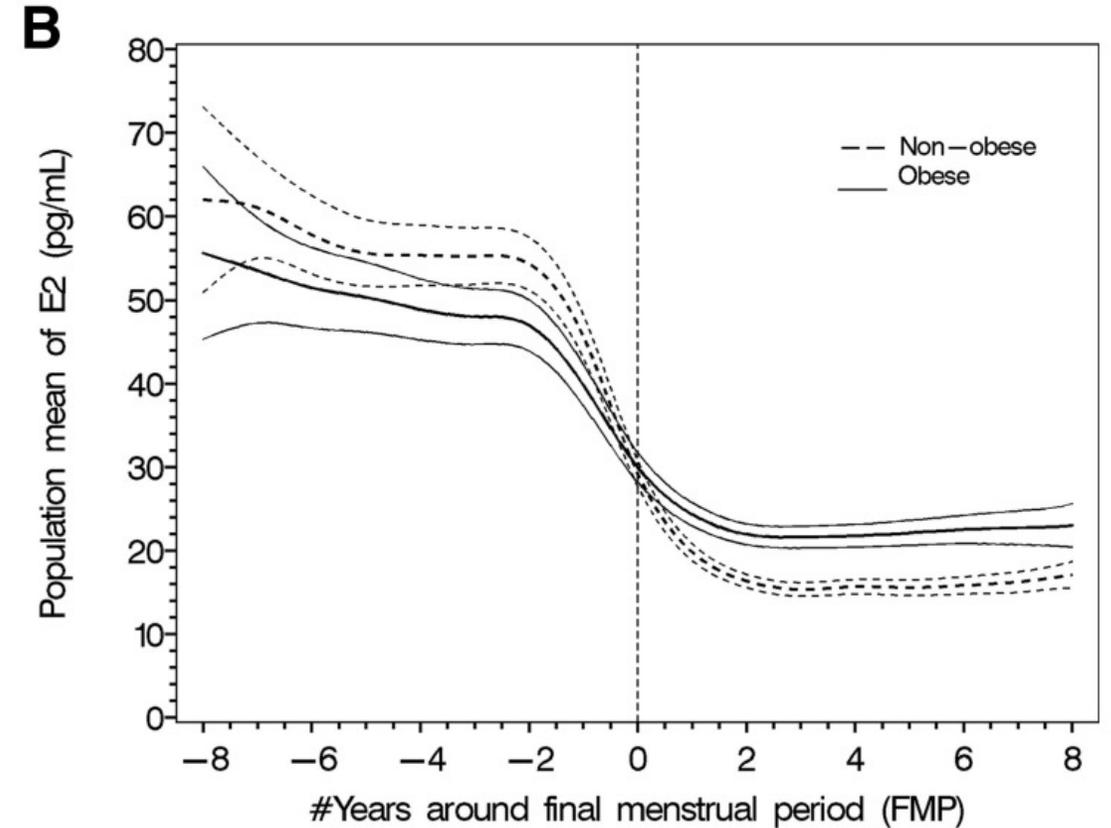
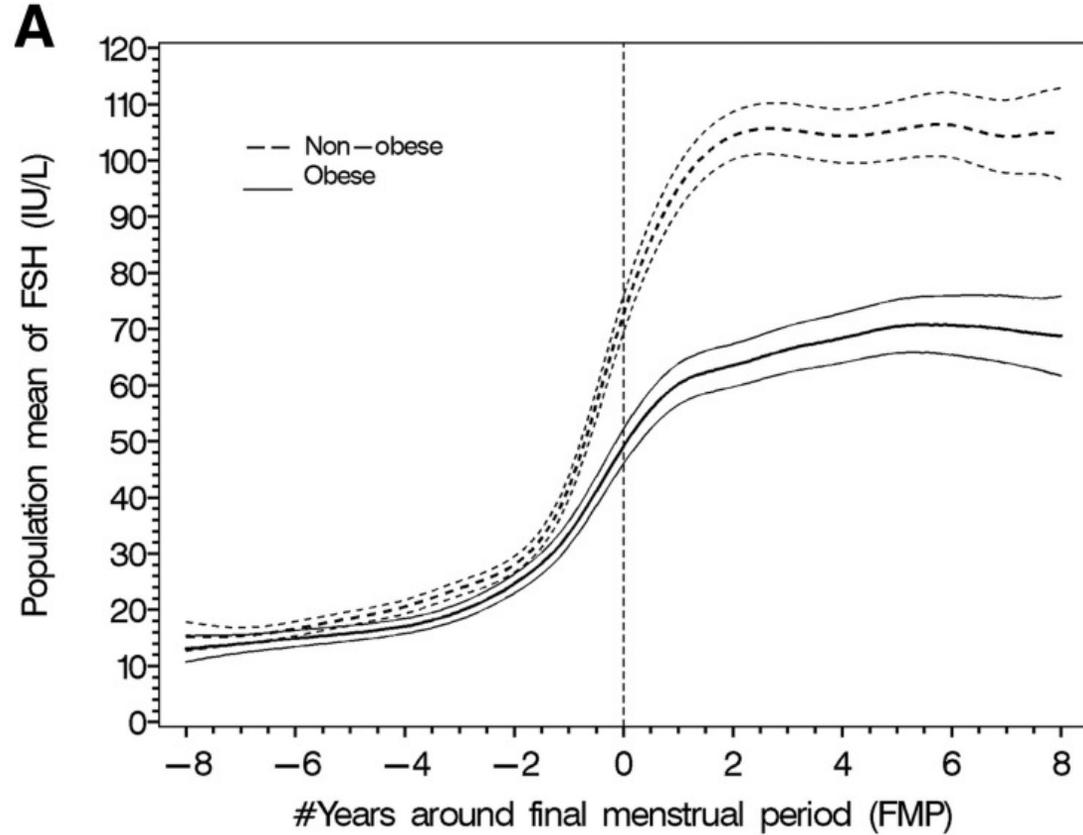
Valores medios ajustados de E2 según edad y en la transición menopáusica



(Burger et al. J Clin Endocrinol
Metab 1999; 84: 4025)

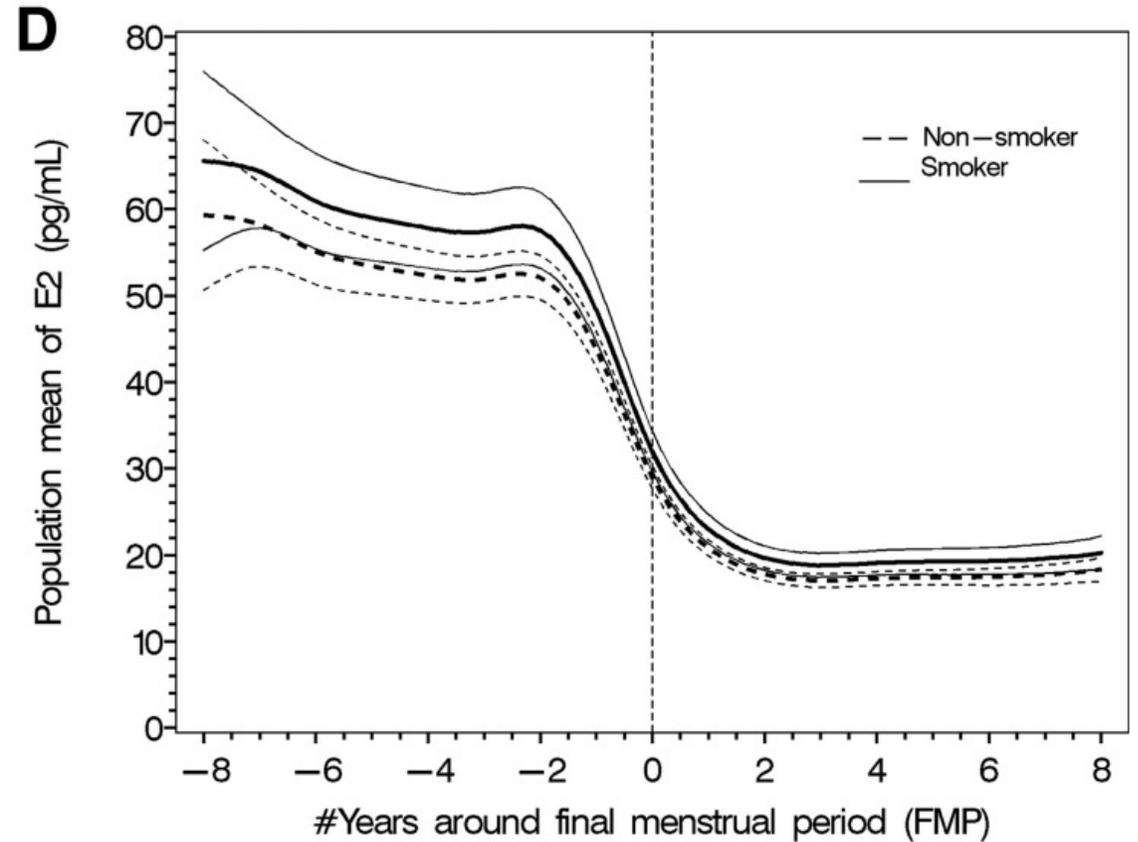
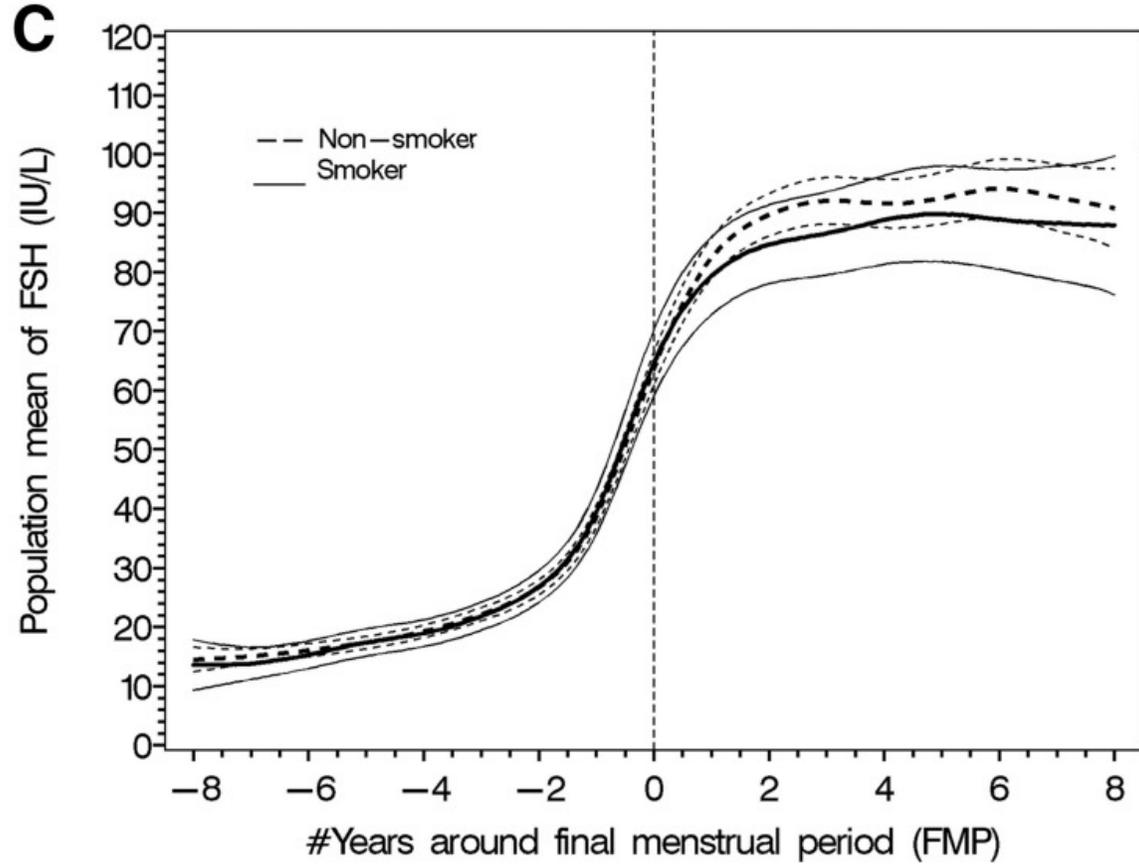
Transición a la menopausia (estudio SWAN)

Factores moduladores: Obesidad

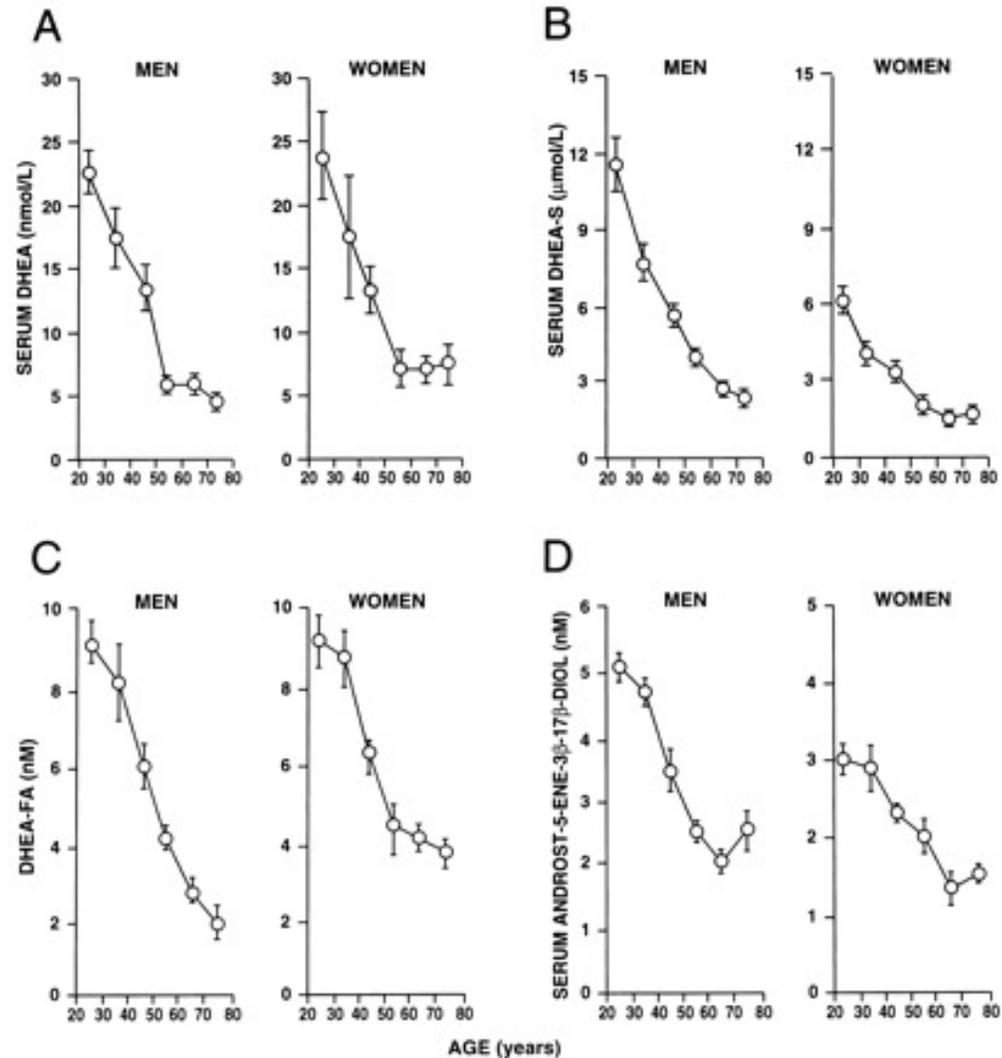


Transición a la menopausia (estudio SWAN)

Factores moduladores: Tabaco



Efecto de la edad sobre concentraciones séricas de DHEA (A), DHEA-S (B), DHEA unida a ésteres de a. grasos (DHEA-FA) (C), y 5-diol (D) en hombres y mujeres.



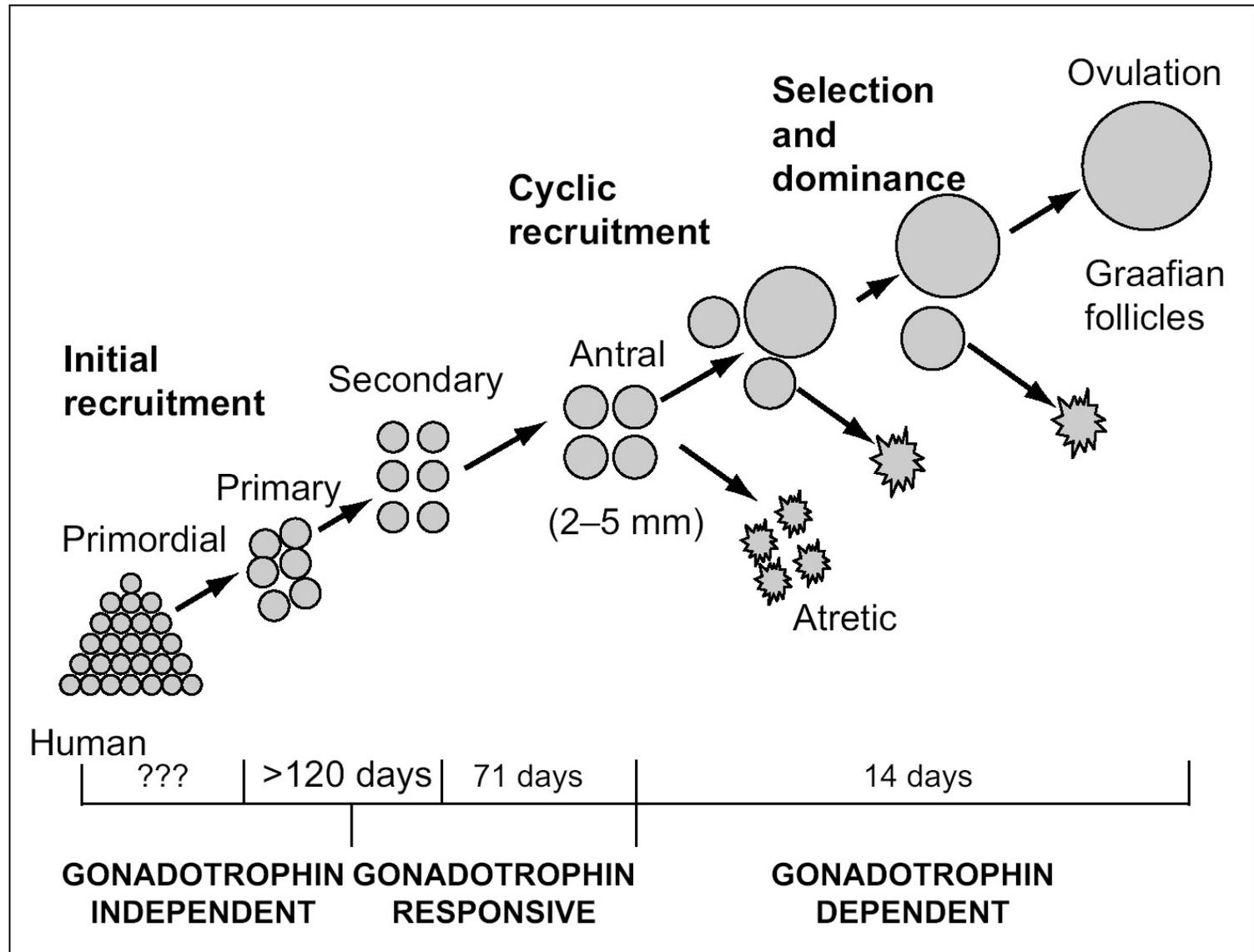


Deseo de gestación en la transición a la menopausia

1. Fertilidad y transición a menopausia: Hormonas
2. Reserva ovárica y calidad ovocitaria
3. Edad como factor determinante
4. Gestación en edad avanzada

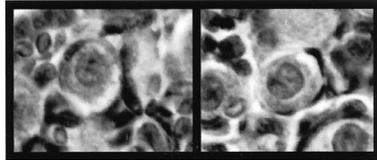
ONLINE

Folliculogénesis: de fol primordial a postovulatorio

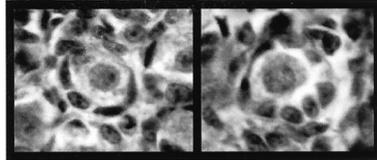


Regulación local de la población folicular

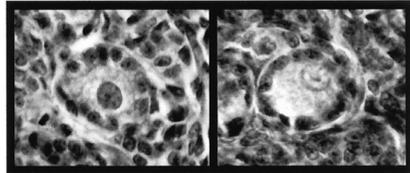
STAGE 0
(PRIMORDIAL)



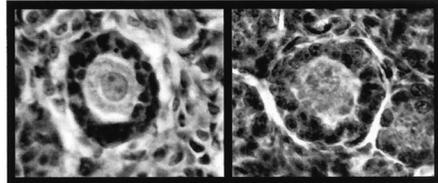
STAGE 1
(EARLY PRIMARY)



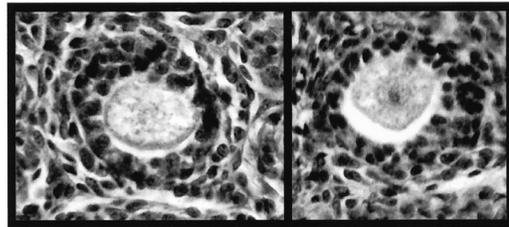
STAGE 2
(PRIMARY)



STAGE 3
(TRANSITIONAL)

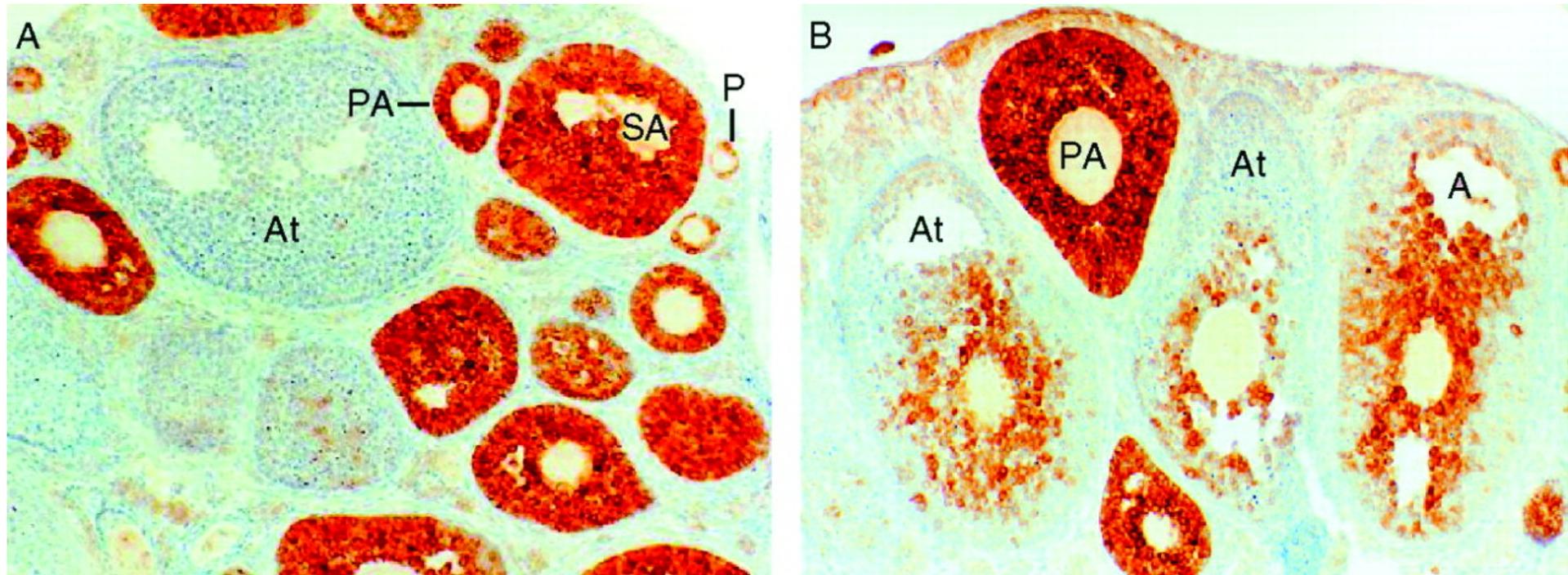


STAGE 4
(PREANTRAL)



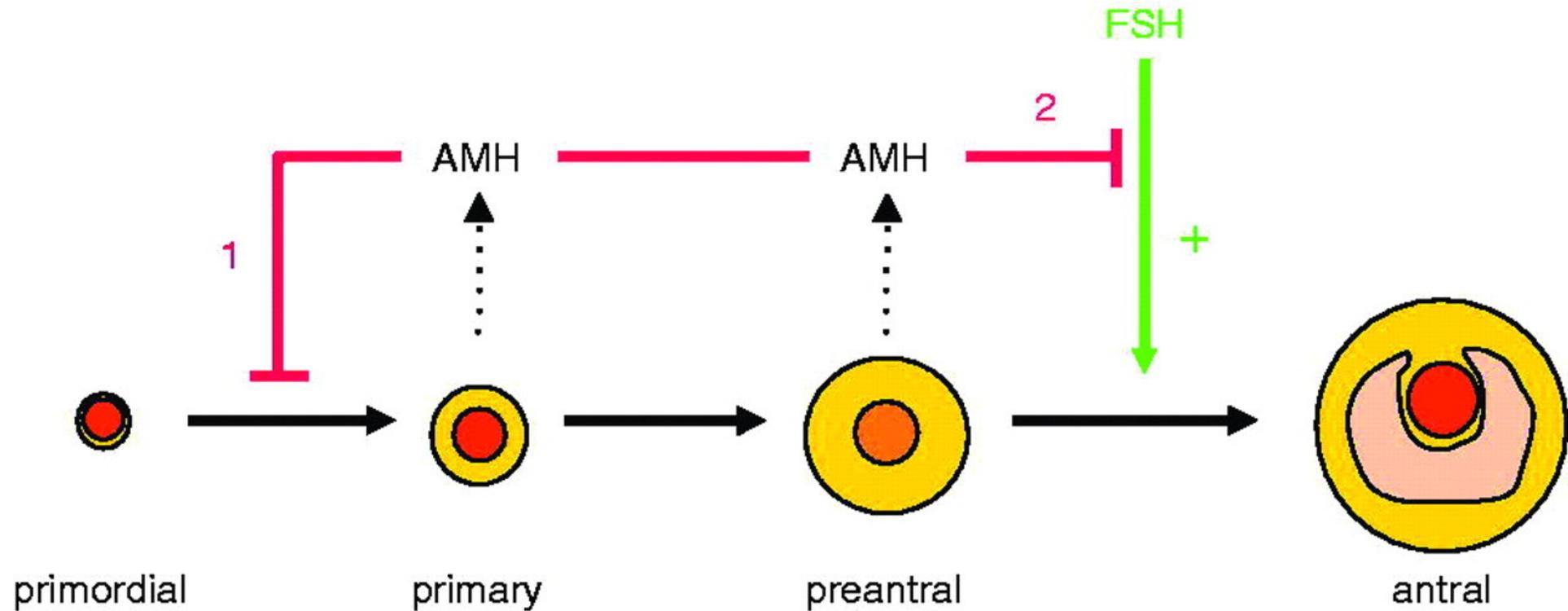
- Kit ligand/Stem Cell factor (SCF)¹
- GDF9²
- bFGF³
- NGF⁴
- AMH

Expresión de AMH en folículos de ratón



(Visser J et al. Reproduction 2006; 131: 1-9)

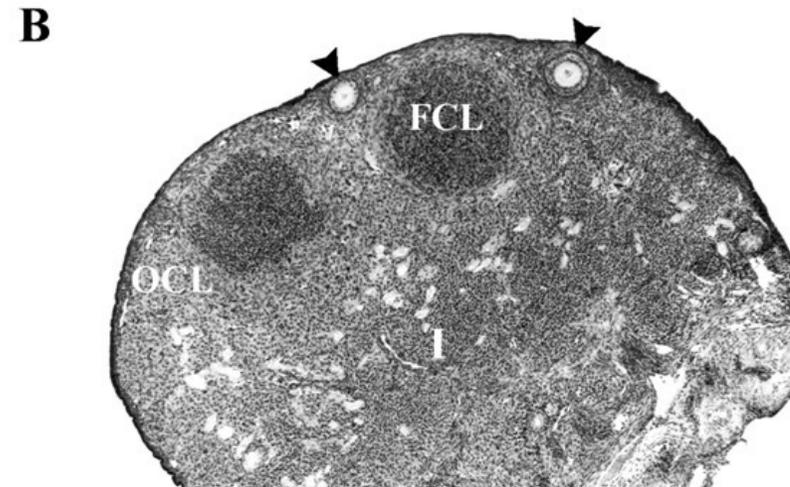
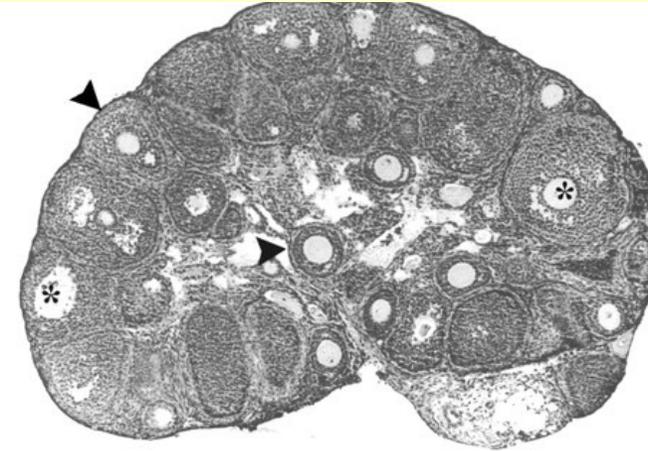
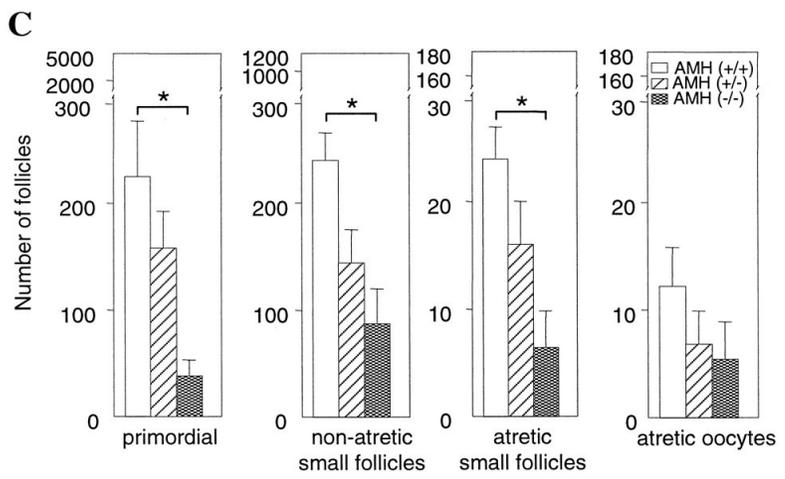
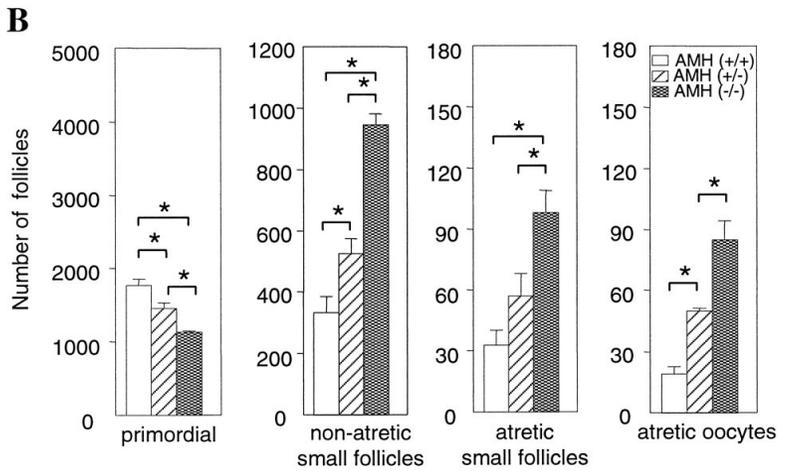
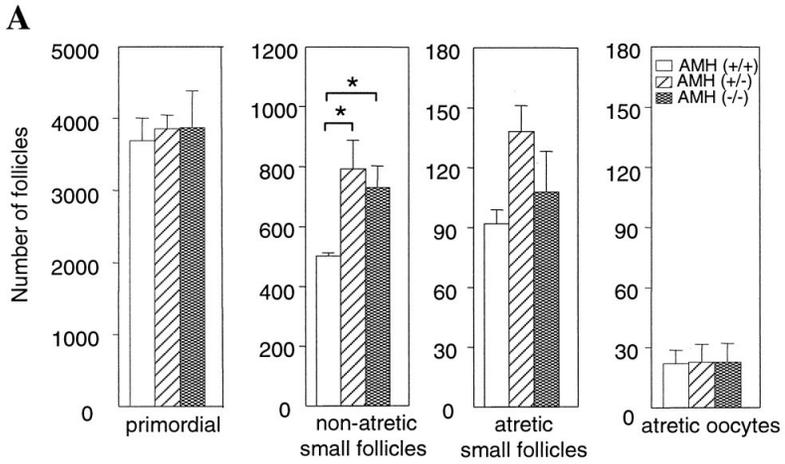
Papel propuesto para AMH en foliculogénesis



(Visser J et al. Reproduction 2006; 131: 1-9)

AMH como regulador de población folicular

A (Durlinger A et al. Endocrinology 1999; 140:5789)



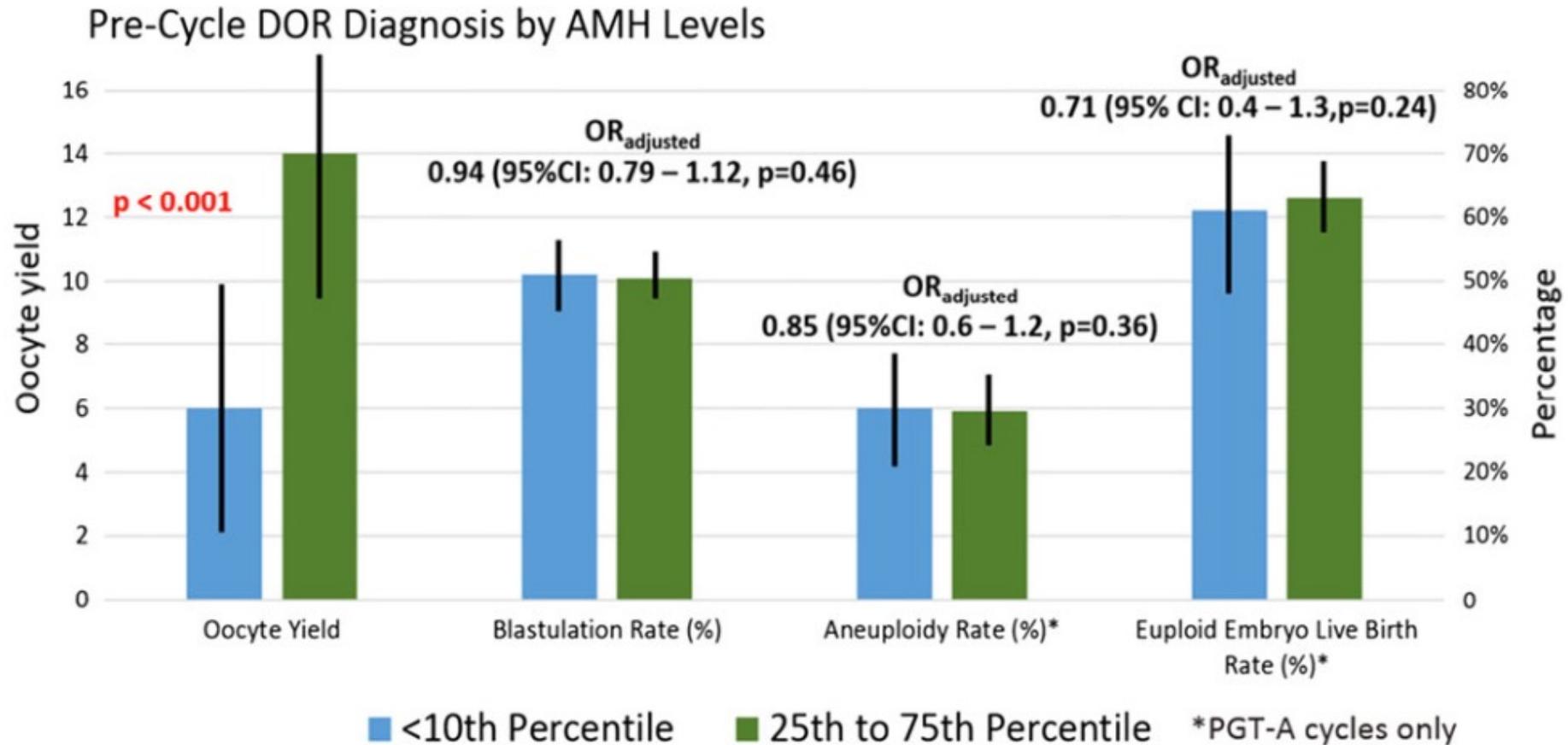


Deseo de gestación en la transición a la menopausia

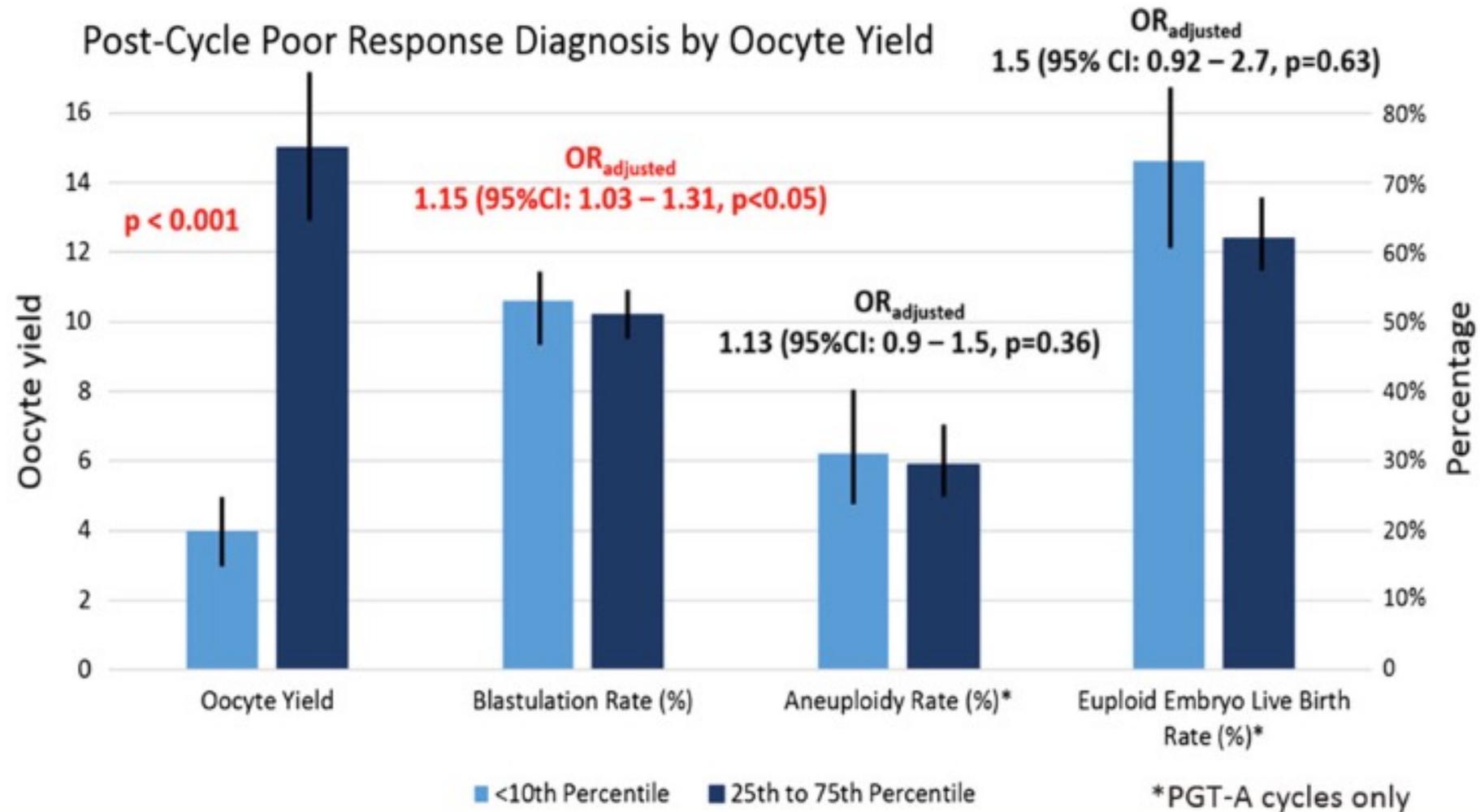
1. Fertilidad y transición a menopausia: Hormonas
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ONLINE

La edad es determinante en el potencial de fertilización ovocitaria

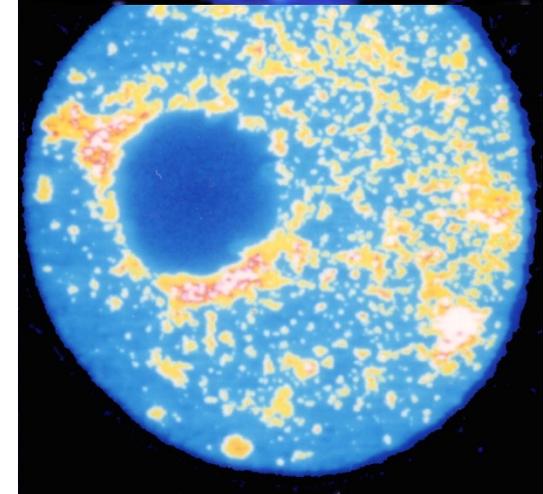
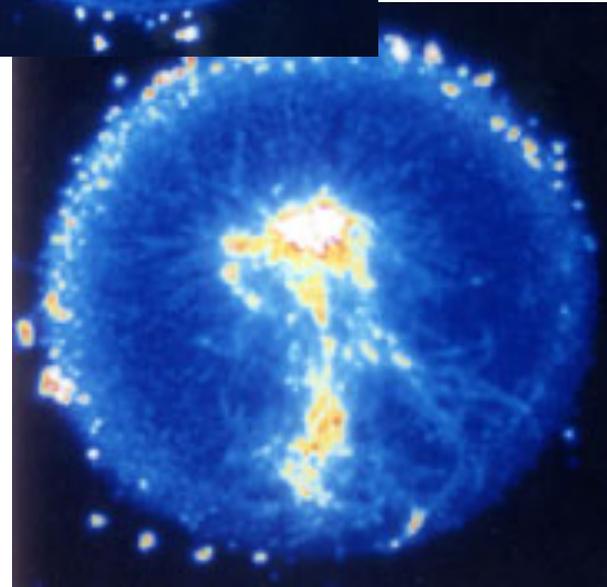
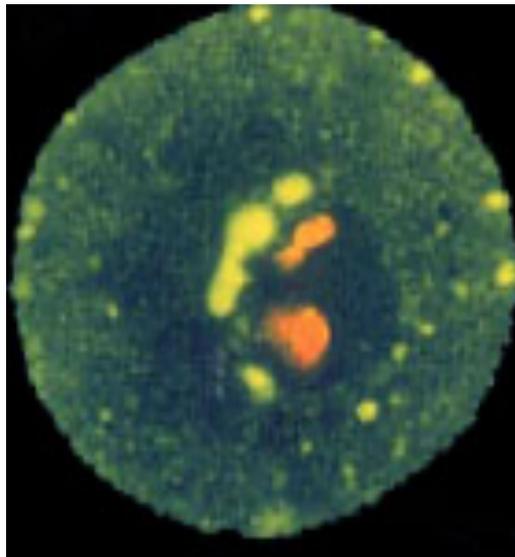
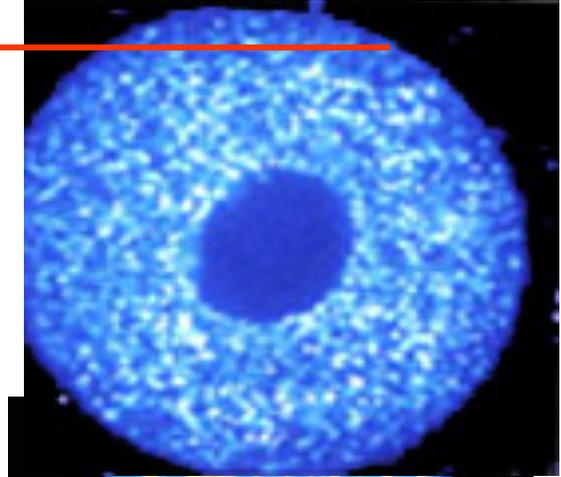
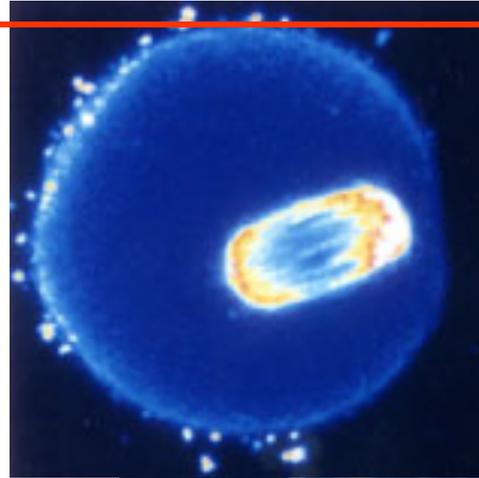


La edad es determinante en el potencial de fertilización ovocitaria

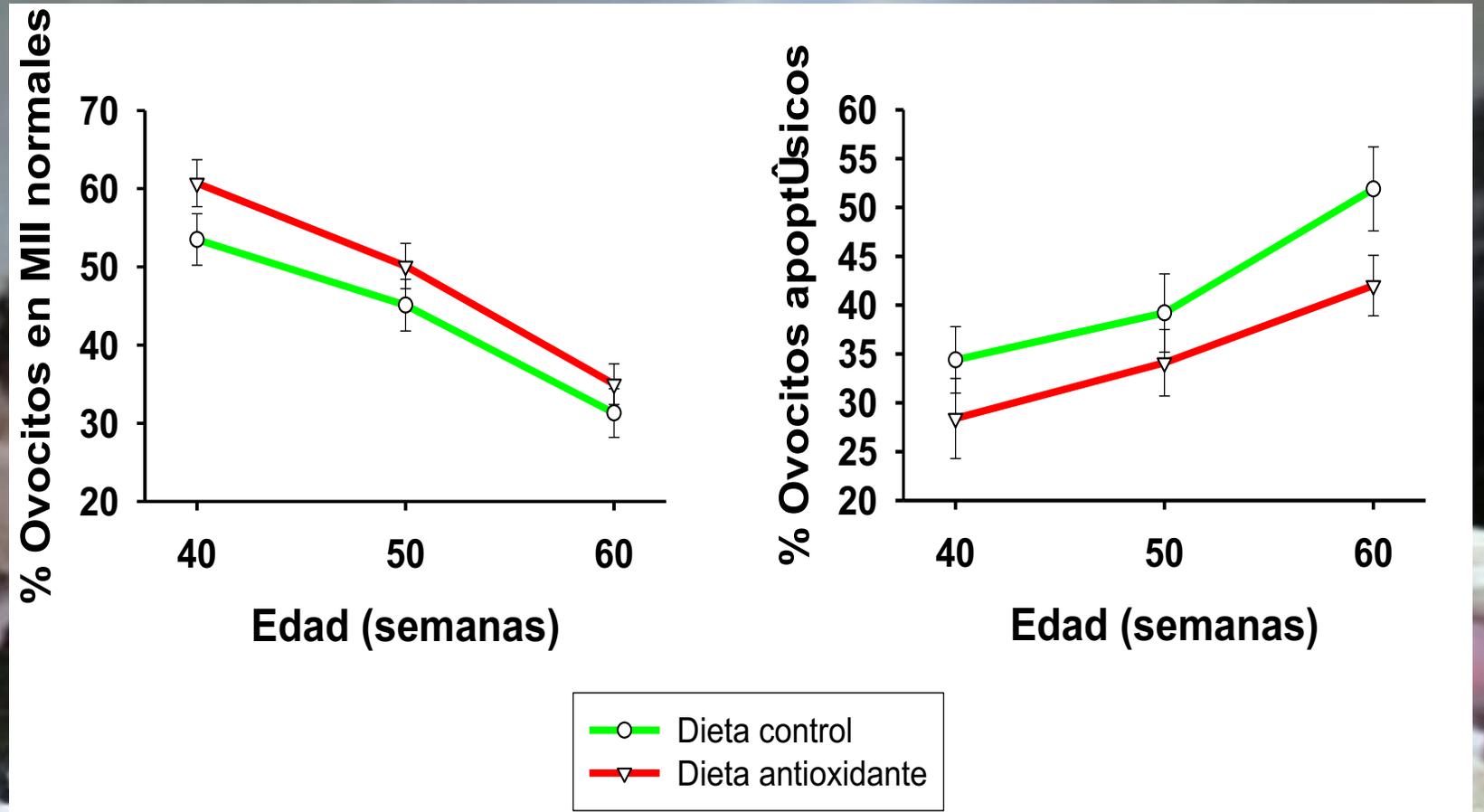


Estrés oxidativo y disfunción reproductiva

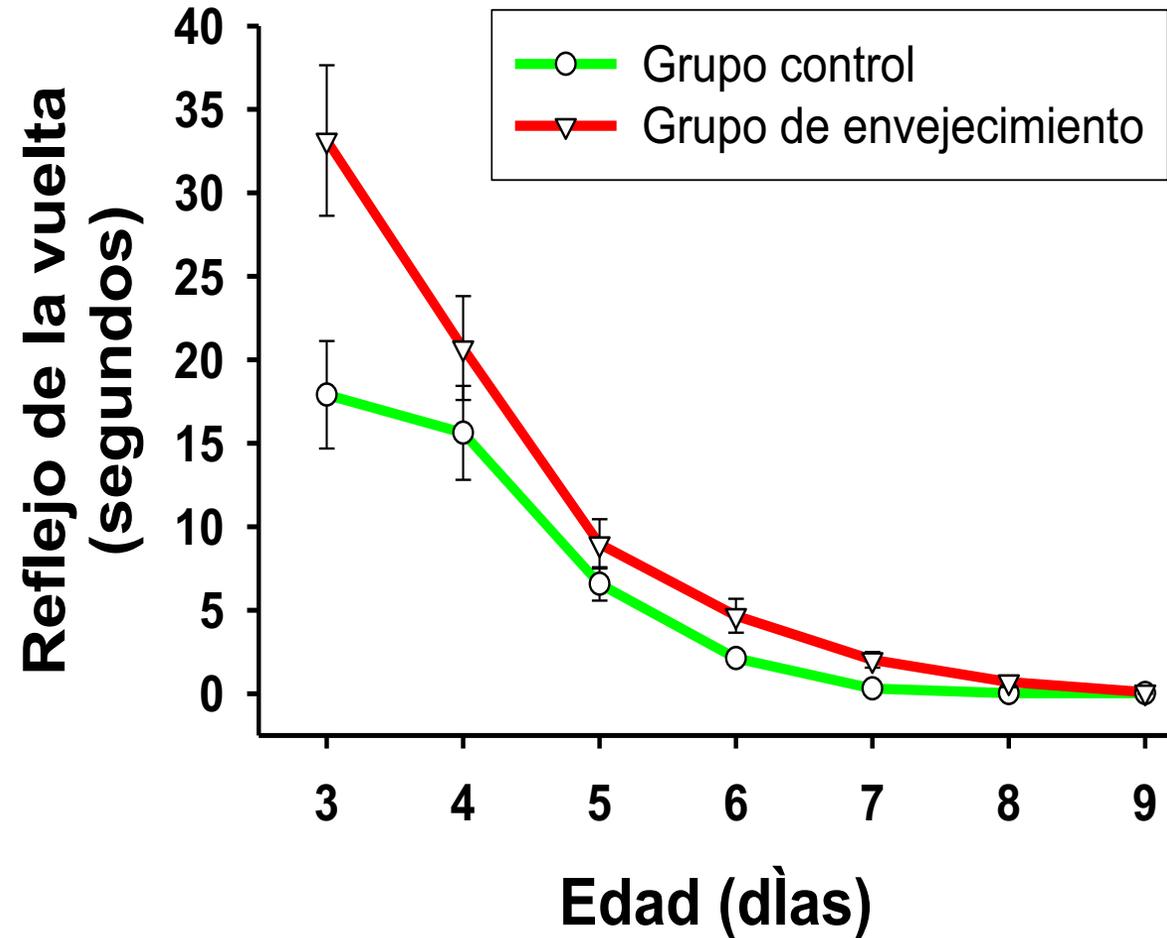
Efectos sobre estructura ovocito y desarrollo inicial



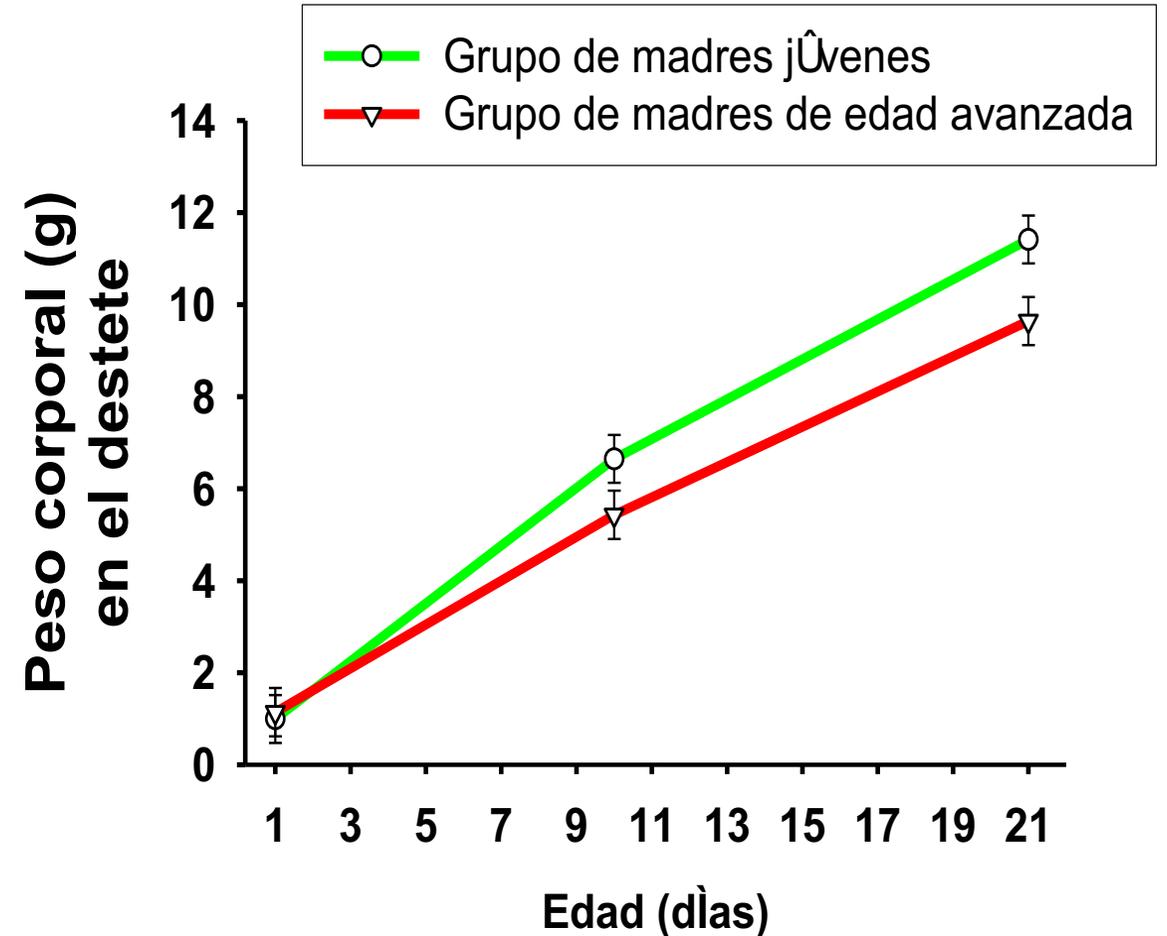
Efecto de la edad de las hembras y administración oral de antioxidantes sobre ovocitos procedentes de oviductos y ovarios



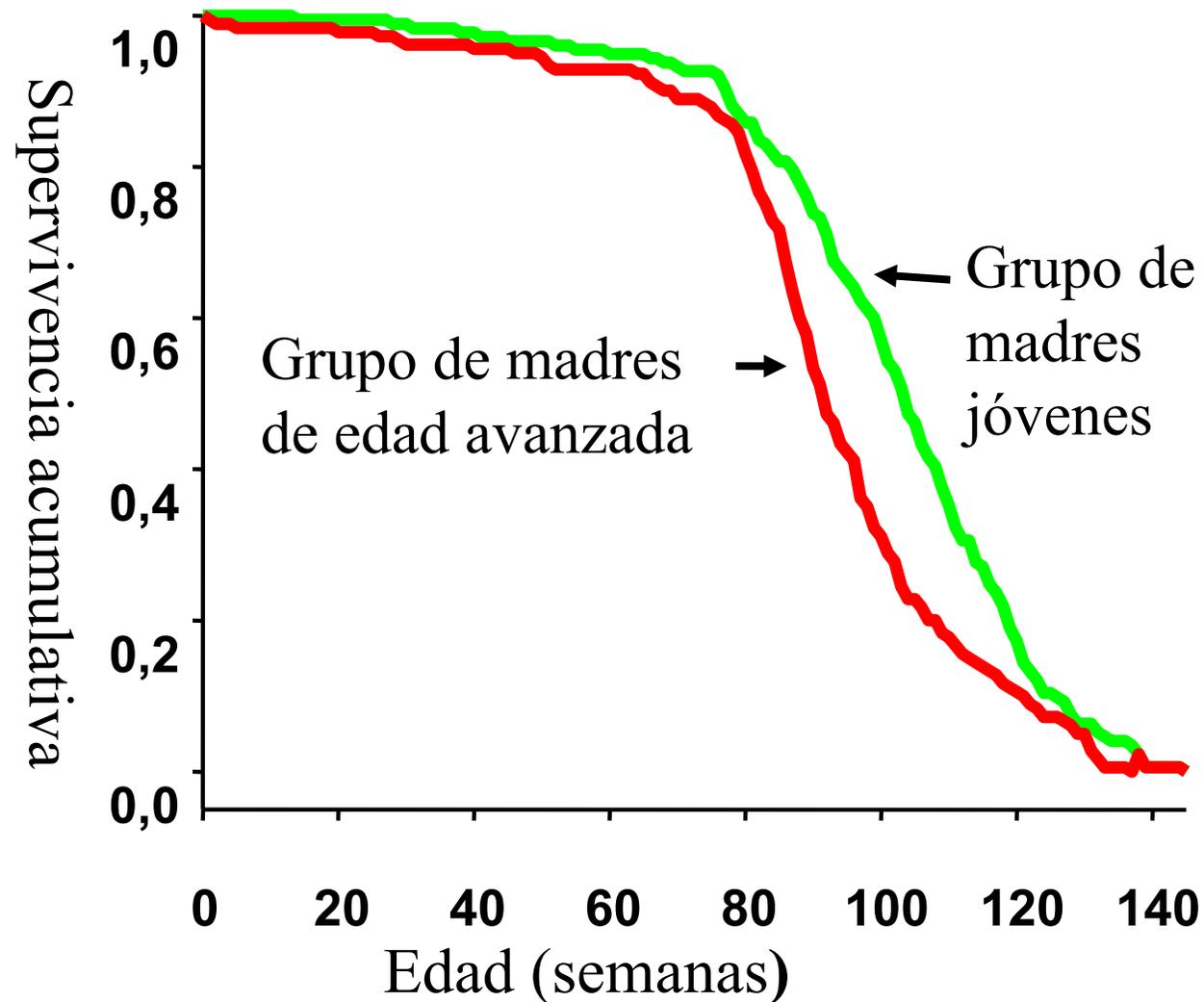
Efecto del envejecimiento post-ovulatorio de ovocitos de ratón sobre el reflejo de la vuelta



Efecto de una maternidad retrasada sobre el peso corporal de los lechales antes del destete



Efecto de una maternidad retrasada sobre la longevidad de los descendientes





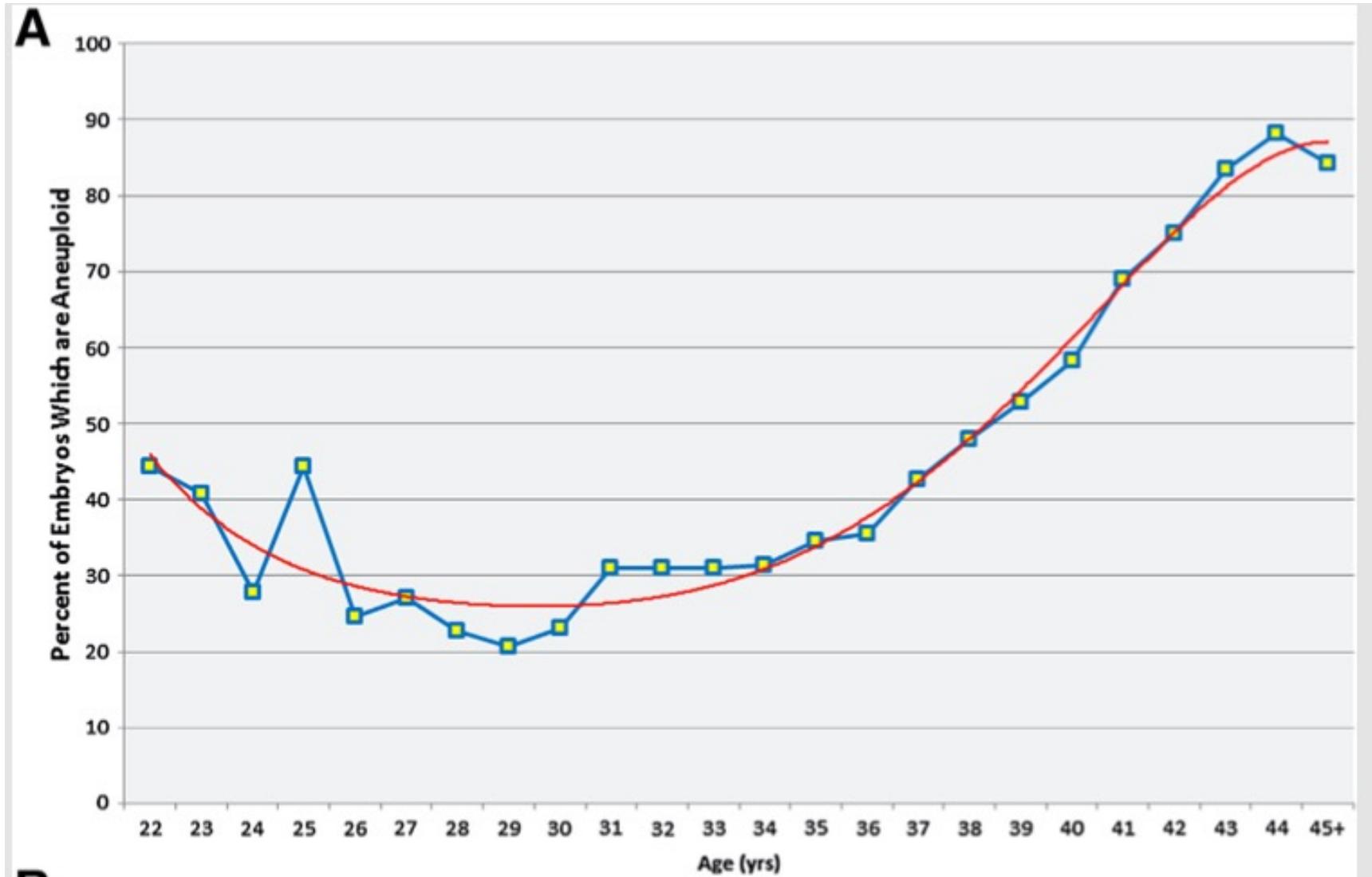
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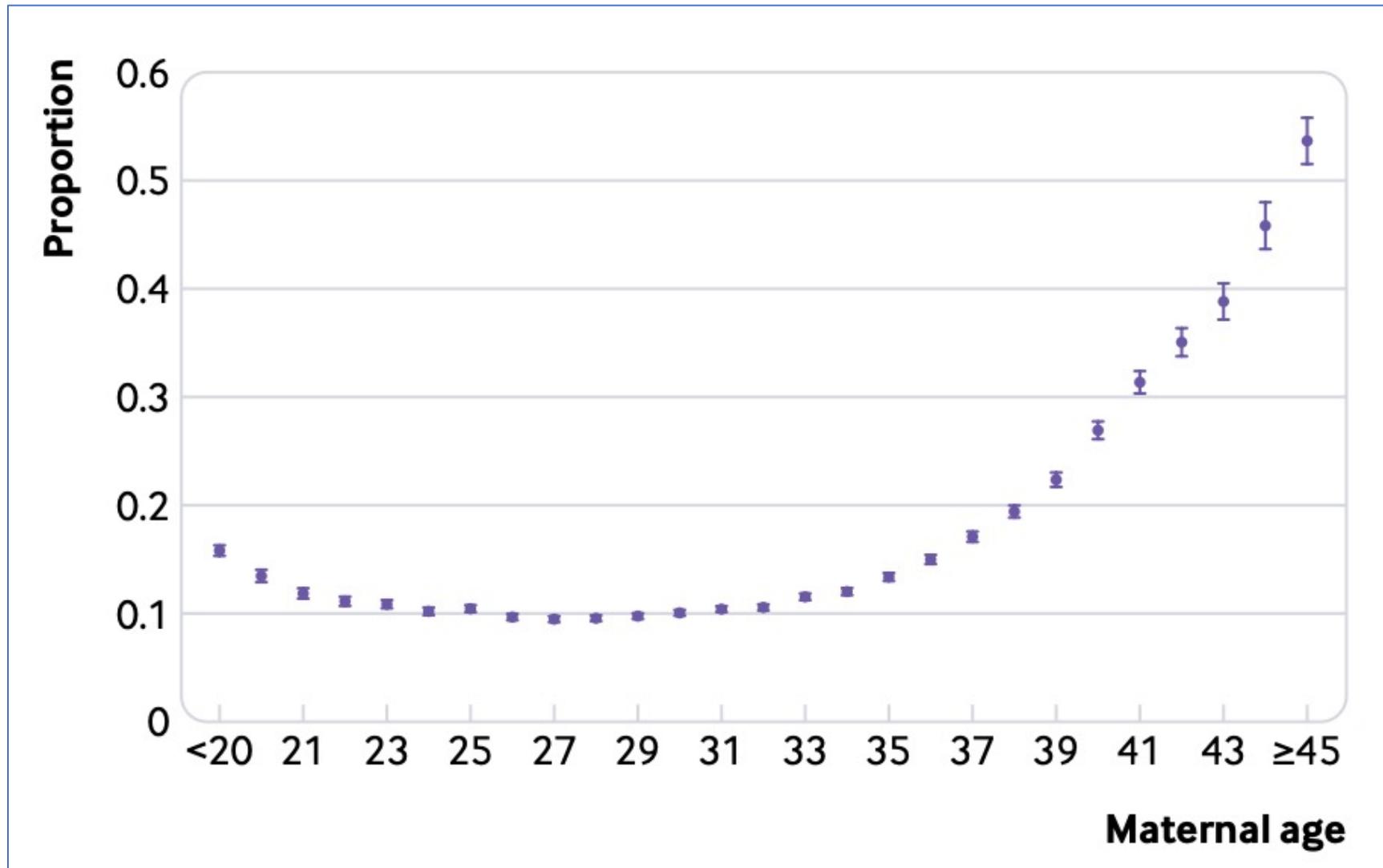
ONLINE

Maternal age & risk of aneuploidy

15,169 consecutive trophectoderm biopsies evaluated with comprehensive chromosomal screening



Riesgo de aborto según edad materna – (Noruega 2009-13 – 421201 pregnancies)



(Magnus et al BMJ 2019; 364:1)

Eventos médicos y obstétricos según edad

(35-44 y >45 vs <35)

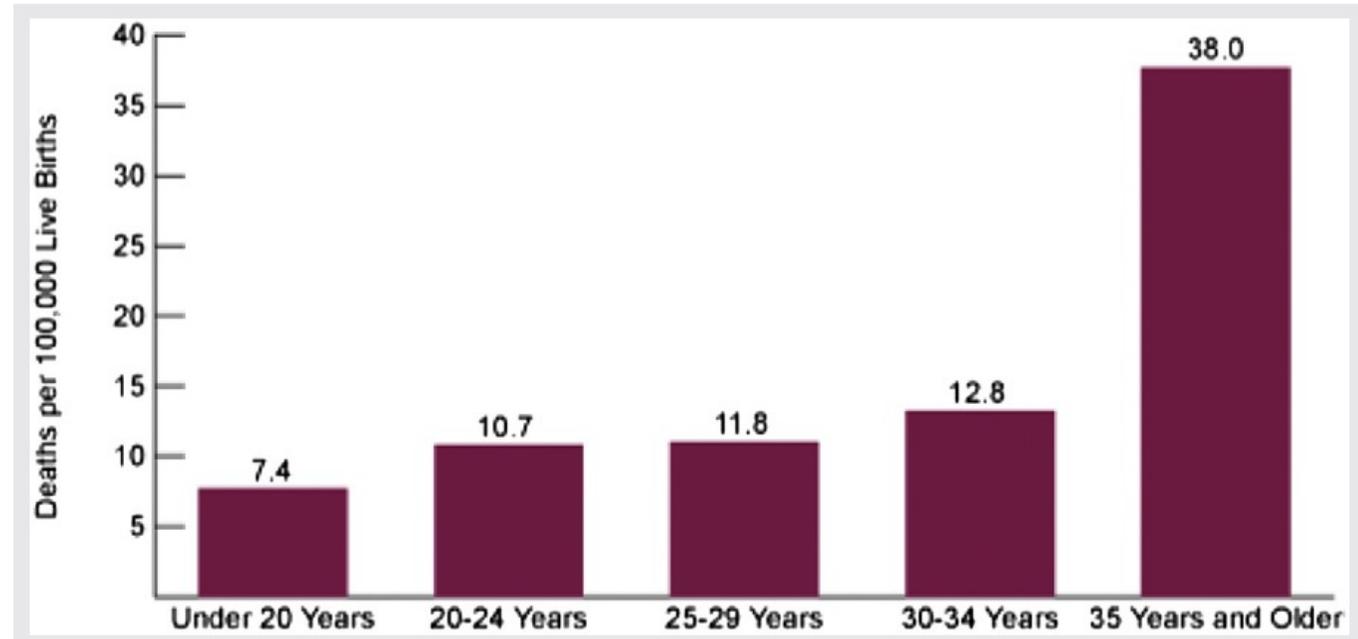
TABLE 1

Medical and obstetric events present at the time of delivery among women aged 35–44 y (n = 1,836,403) and aged ≥45 y (n = 23,807) compared with women aged <35 y (n = 10,768,536), Nationwide Inpatient Sample, years 2008–2010.

Condition/event	Age 35–44 y	Age ≥45 y
Medical condition		
Maternal death	2.07 (1.78–2.40)	9.90 (5.60–15.98)
Transfusion	1.21 (1.20–1.23)	2.46 (2.27–2.68)
Myocardial infarction	4.05 (3.29–4.98)	21.38 (11.46–39.88)
Cardiac arrest	2.07 (1.80–2.42)	10.84 (6.48–18.14)
Pulmonary embolism	1.83 (1.69–1.98)	5.01 (3.47–7.23)
Deep vein thrombosis	2.02 (1.91–2.14)	4.38 (3.26–5.89)
Acute renal failure	1.86 (1.76–1.97)	6.38 (5.06–8.04)
Obstetric event		
Cesarean delivery	1.62 (1.61–1.62)	2.51 (2.44–2.57)
Gestational diabetes	2.42 (2.41–2.44)	3.5 (3.37–3.62)
Gestational hypertension	1.11 (1.10–1.12)	2.17 (2.09–2.25)
Preterm labor	1.16 (1.15–1.17)	1.91 (1.84–1.98)
Fetal growth restriction	0.92 (0.91–0.93)	1.53 (1.42–1.64)
Fetal demise	1.30 (1.27–1.33)	2.53 (2.22–2.89)
Premature rupture of membranes	1.10 (1.09–1.11)	1.38 (1.30–1.46)

Note: Values are odds ratio (95% confidence interval). Modified from reference (12). All P values < .001 compared with women aged <35 y.

Sauer. Reproduction at advanced maternal age. *Fertil Steril* 2015.



Resultados obstétricos adversos según edad materna

Summary of risks of select adverse pregnancy outcomes at advanced maternal age.

Adverse Outcome	Age 35-39		Age >40	
	Absolute Risk (%)	aORs	Absolute Risk (%)	aORs
Pregnancy Loss				
First Trimester Miscarriage	17	—	34–54	—
Second Trimester Miscarriage	1.0–1.5	1.3–2.0	1.7–2.2	2.4–3.1
Stillbirth	0.3–0.6	1.4	0.4–0.9	2.12
Fetal Complications				
Chromosomal Abnormalities	0.8–1.3	2.5–4.0	1.9–3.8	7.4–9.9
Fetal Growth Restriction	4.7	1.2–1.6	5.9	1.4–3.9
Maternal Complications				
Pre-eclampsia	2.3	1.2–1.6	3.3	1.5–2.4
Gestational Diabetes	2.4	1.6–2.0	3.1	1.9–3.8

aORs-adjusted odds ratios. Adapted from Refs. [4,6,7,9,15].

Gestantes en edad maternal muy avanzada

TABLE 1

Maternal characteristics and maternal and fetal outcomes in singleton gestations conceived either spontaneously or with assisted reproductive technology (ART).

Variable	Spontaneous (n = 193)	ART (n = 185)	P value
Maternal characteristic			
Age (y), mean	45.6 ± 0.1	47.0 ± 2.3	< .05
Race/ethnicity, % white	75.6	88.1	< .002
Parity	1.2 ± 1.8	0.4 ± 0.9	< .001
Maternal outcome			
Postpartum hemorrhage, %	3.1	5.9	NS
Estimated blood loss (mL)			
Vaginal delivery	303 ± 104	324 ± 116	NS
Cesarean delivery	730 ± 284	713 ± 137	NS
Retained placenta, %	0	2.7	< .02
Transfusion, %	2.1	1.1	NS
Hysterectomy, %	0	0.5	NS
Rate of ICU admission, %	0	1.1	NS
Length of stay (d), mean	3.2 ± 2.2	4.2 ± 3.9	< .01
Total CD, %	49.7	75.1	< .001
Primary CD	35.3	71.3	
Repeat CD	22.2	13.5	
Fetal outcome			
Gestational age, wk	38.9 ± 2.4	38.9 ± 2.4	NS
Birth weight, g	3,318 ± 527	3,284 ± 567	NS
NICU admission rate, %	1.5	4.3	NS
Apgar score at 5 min	8.8 ± 1	8.9 ± 0.7	NS

Note: CD = cesarean delivery; ICU = intensive care unit; NICU = neonatal intensive care unit; NS = not significant.

Jackson. *Pregnancy in very advanced maternal age. Fertil Steril* 2015.

TABLE 3

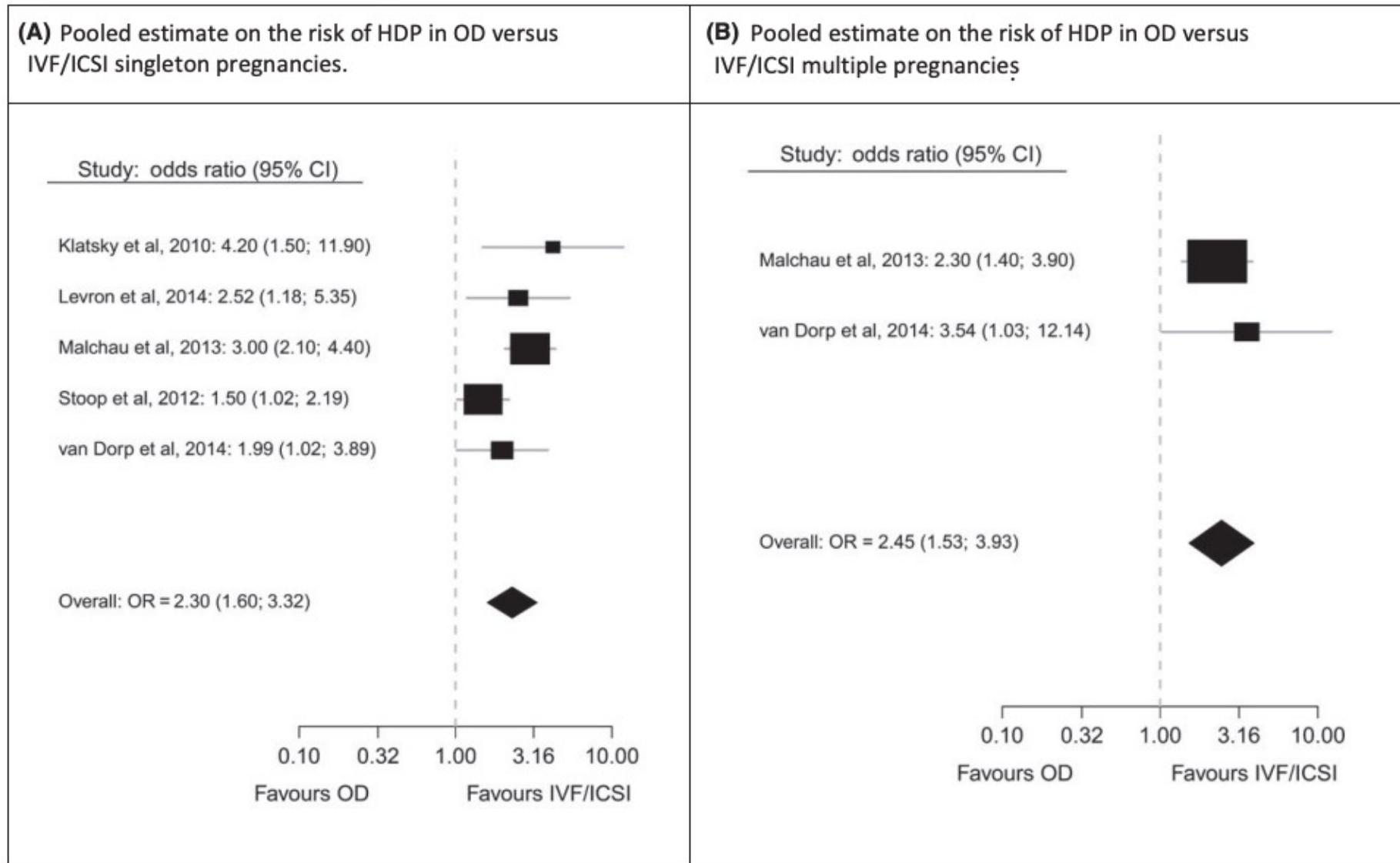
Maternal characteristics and maternal and fetal outcomes in singleton gestations conceived through assisted reproductive technology using autologous versus donor oocytes.

Variable	Autologous oocytes (n = 64)	Donor oocytes (n = 120)
Maternal characteristic		
Age (y), mean	46.7 ± 2.0	47.1 ± 2.2
Race/ethnicity, % white	90.8	87.4
Parity, mean	0.54 ± 0.16	0.32 ± 0.56
Maternal outcome		
Postpartum hemorrhage, %	0	4.2
Estimated blood loss (mL), mean		
Vaginal delivery	317 ± 90	325 ± 122
Cesarean delivery	712 ± 151	719 ± 121
Retained placenta, %	1.6	3.3
Transfusion, %	0	1.7
Rate of ICU admission, %	0	1.7
Length of stay (d), mean	4.7 ± 4.6	4.1 ± 3.4
Total CD, %	81.5	70.8
Primary CD	68.8	71.3
Repeat CD	31.3	11.8
Fetal outcomes		
Gestational age, wk	38.7 ± 1.8	39.0 ± 2.7
Birth weight, g	3,237 ± 585	3,317 ± 556
NICU admission rate, %	4.6	4.2
Apgar score at 5 min	8.9 ± 0.2	8.8 ± 0.9

Note: All P values are not significant. CD = cesarean delivery; ICU = intensive care unit; NICU = neonatal intensive care unit.

Jackson. *Pregnancy in very advanced maternal age. Fertil Steril* 2015.

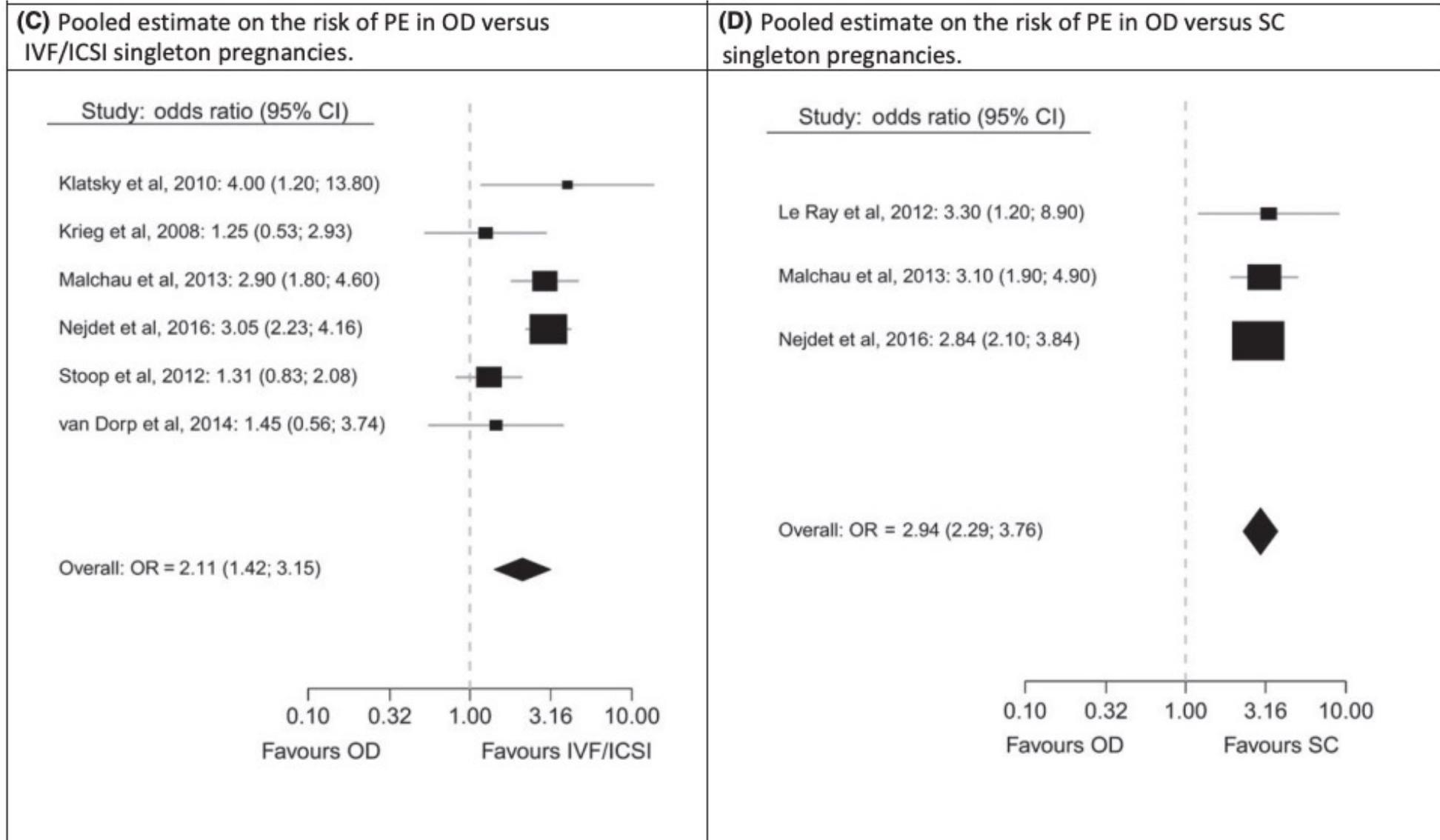
Complicaciones obstétricas y neonatales de la donación de ovocitos (1)



HDP: hypertensive disorders of pregnancy

(Storgaard et al. BJOG 2017;124:561)

Complicaciones obstétricas y neonatales de la donación de ovocitos (2)



PE: preeclampsia

(Storgaard et al. BJOG 2017;124:561)

Mensajes para llevar a casa

1. La fertilidad se reduce muy drásticamente unos 8 años antes que la función endocrina del ovario.
2. La transición a la menopausia se manifiesta con deterioro hormonal y síntomas asociados.
3. Hay un incremento persistente en la edad de la maternidad.
4. En la transición a la menopausia la fertilidad va ligada a uso de TRA (ovodonación).
5. La gestación en edad maternal avanzada presenta riesgo elevado.
6. La gestación con ovodonación no está exenta de riesgo.