

Carence Martiale en Obstétrique

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Conflits d'intérêts

- J'ai, et/ou mon institution, avons reçu des subventions des laboratoires:
 - Vifor Pharma
 - Pfizer/Hospira
 - Masimo
 - LFB

*COLLÈGE NATIONAL
DES GYNÉCOLOGUES ET OBSTÉTRICIENS FRANÇAIS*

SUPPLÉMENTATION AU COURS DE LA GROSSESSE

Recommandations pour la pratique clinique
Paris, 5 décembre 1997

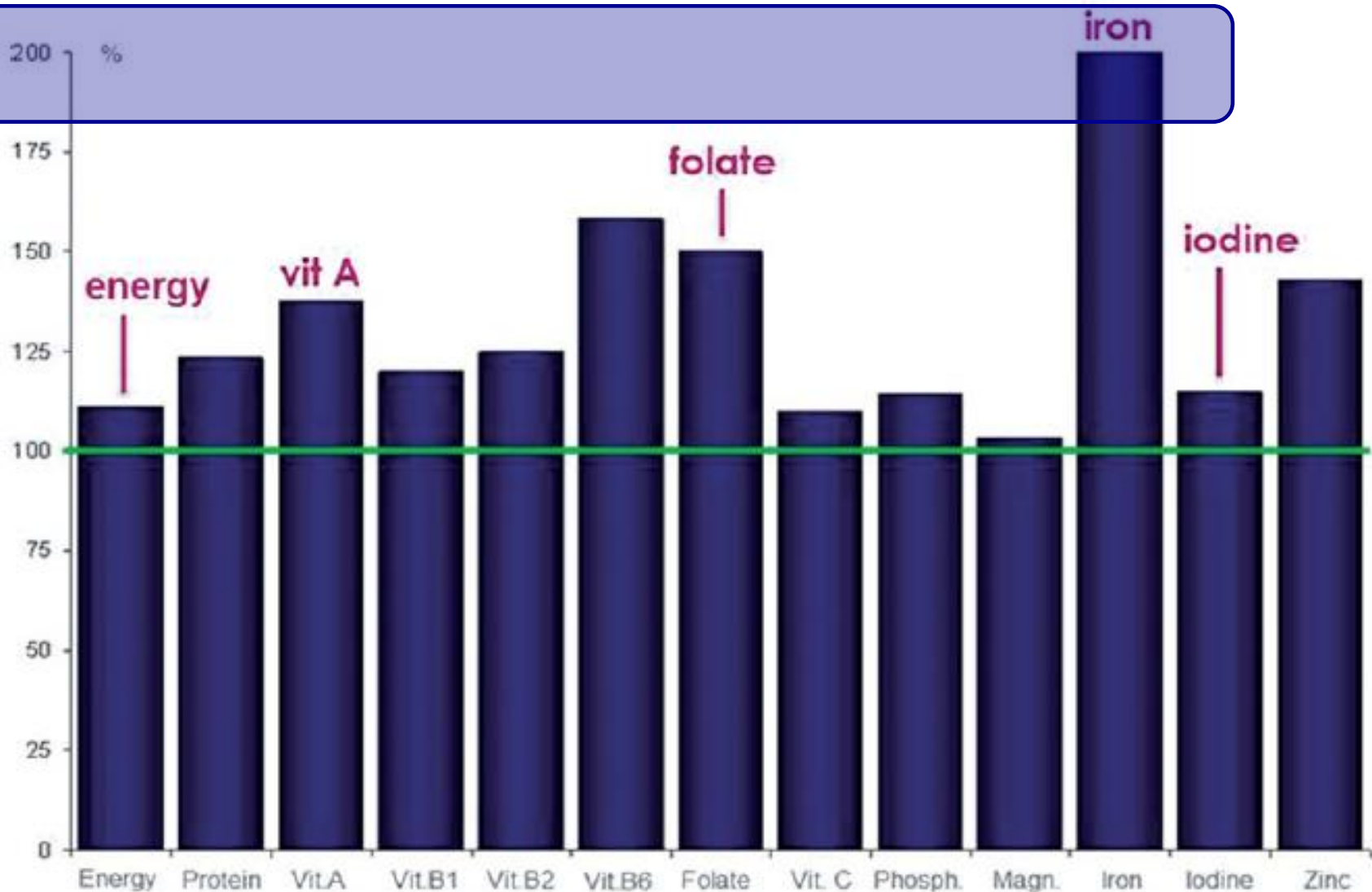
Pas de substitution systématique ??

Recommandations OMS

Box 2. WHO recommendations for dietary supplementation in pregnant women.

Supplement	Level of evidence/recommendation
Vitamin A	Not recommended in developed countries
Iodine	Need for future research
Vitamin D	Need for future research
Calcium	Recommended in regions with low intake
Folic acid	Strongly recommended
Iron	Strongly recommended

200% des apports « habituels »!!

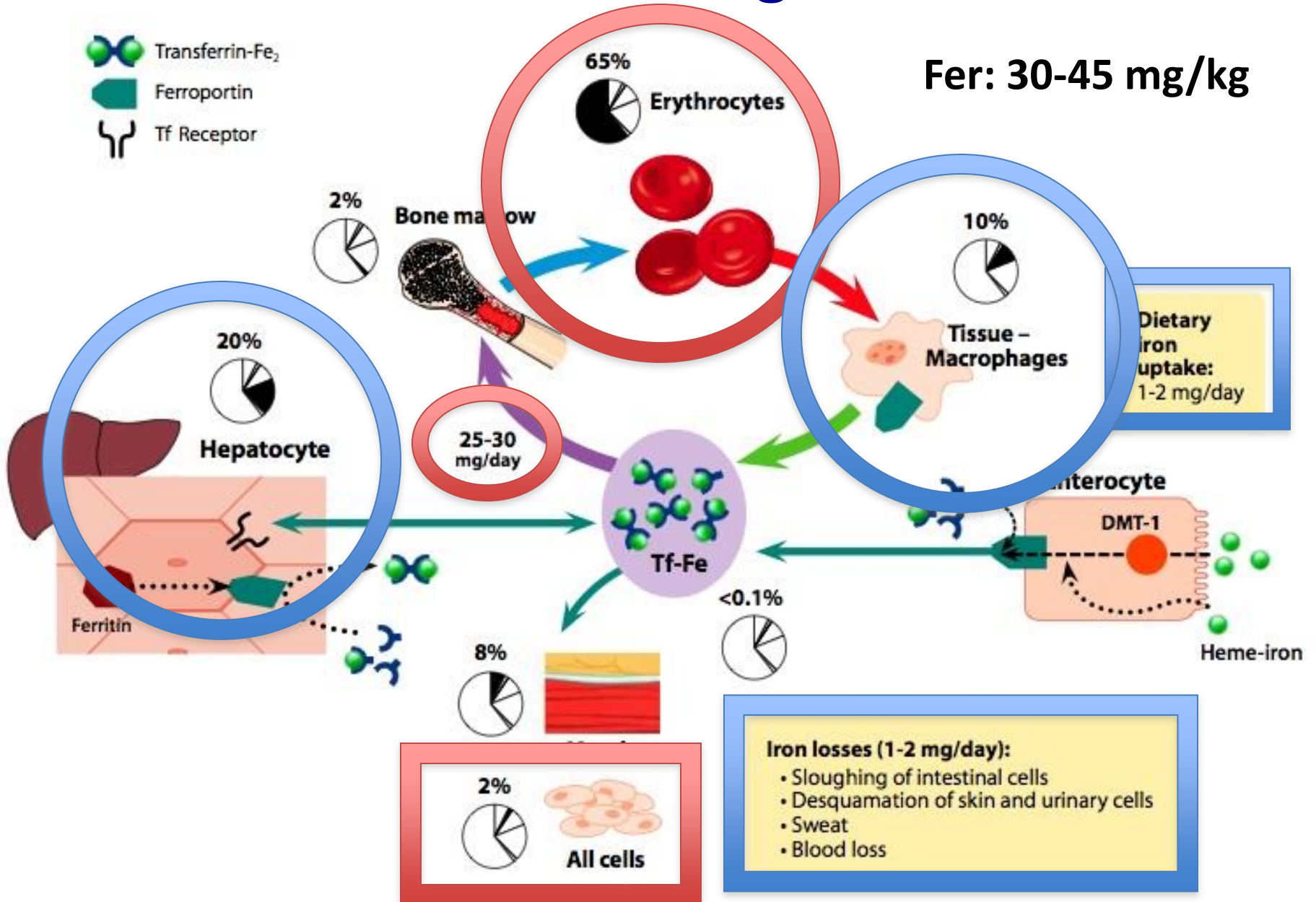


Comment je fais ?



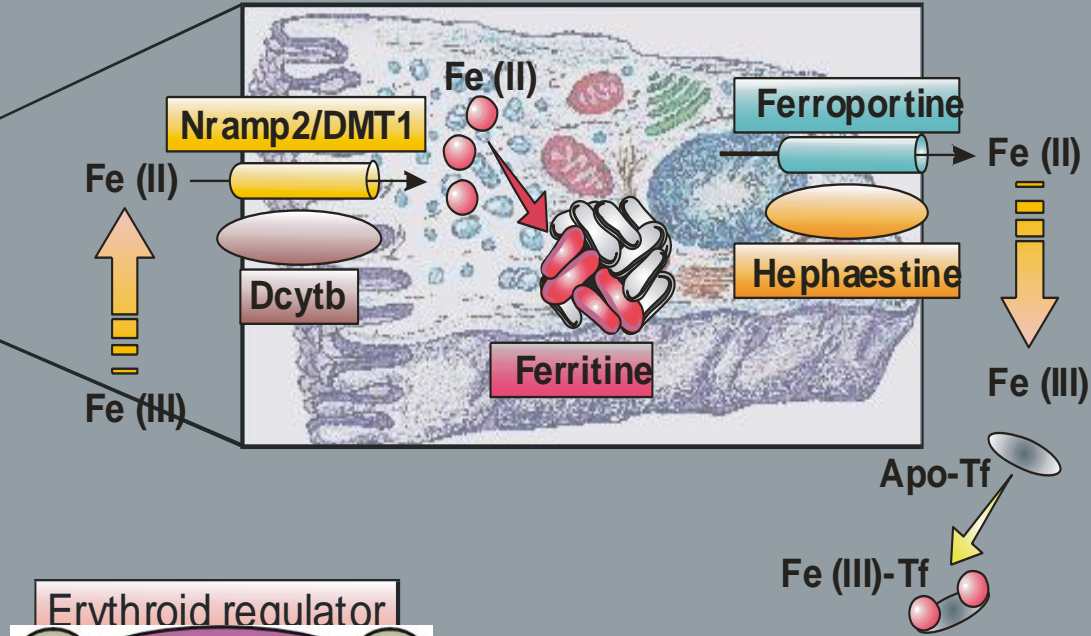
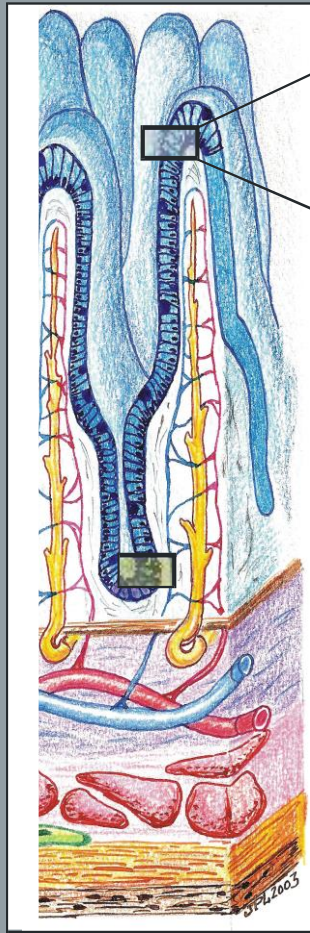
Le fer dans l'organisme

Fer: 30-45 mg/kg

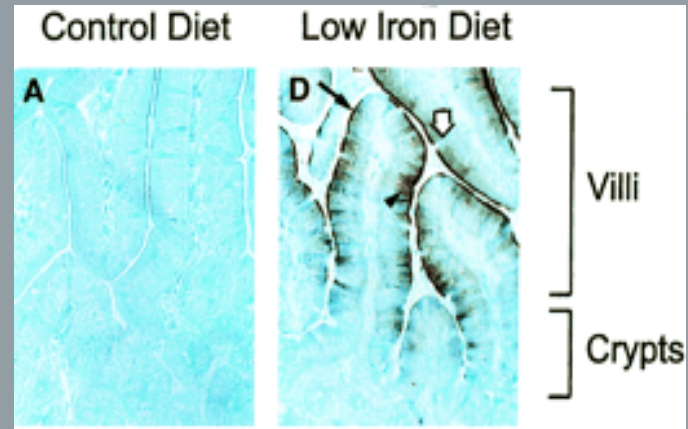


Absorption intestinale du fer

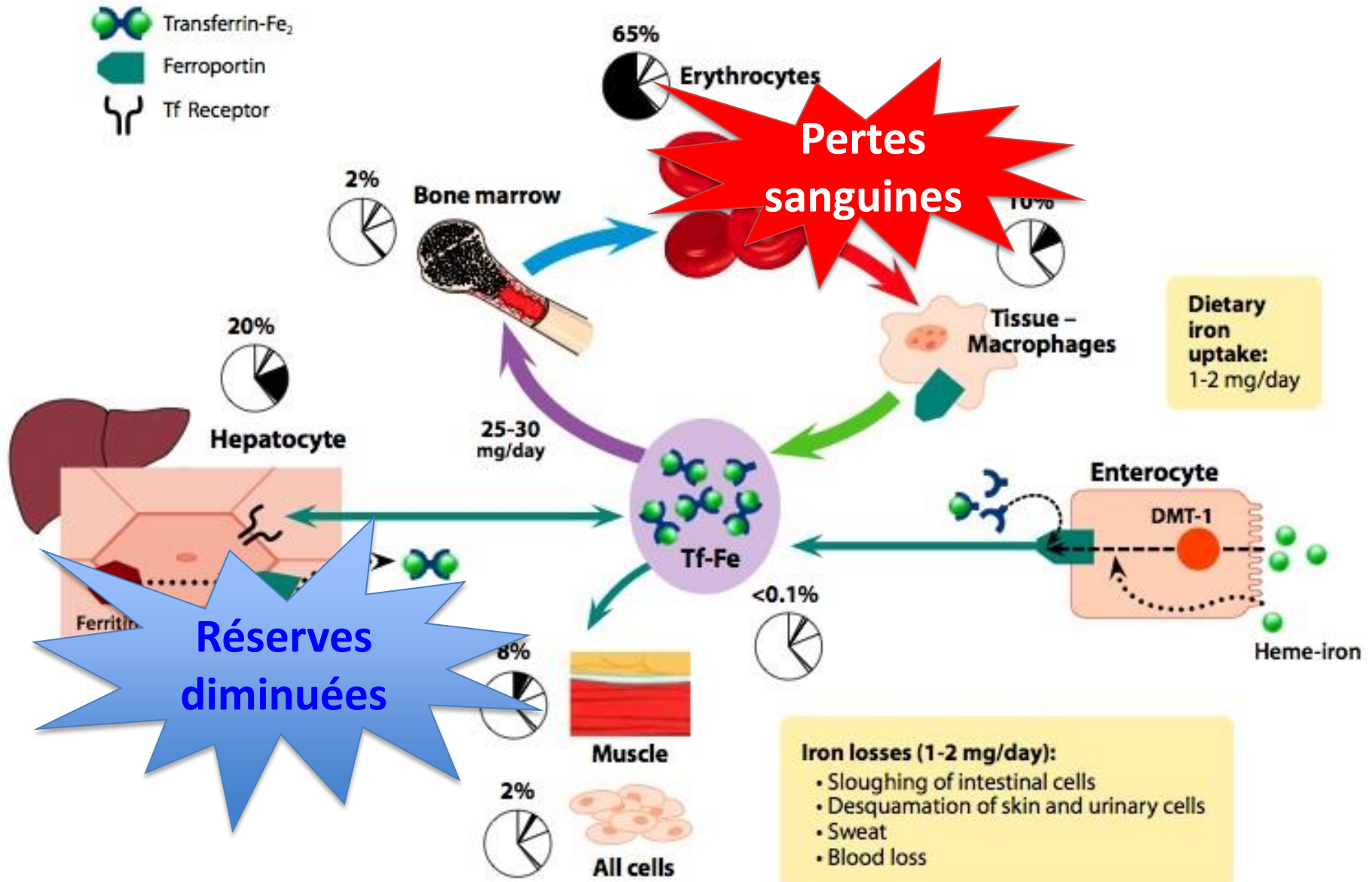
Villosités duodénales



Nramp2/DMT1



La Carence Martiale *maternelle*



Conséquences pour l'enfant?

THE JOURNAL OF PEDIATRICS • www.jpeds.com

ORIGINAL
ARTICLES

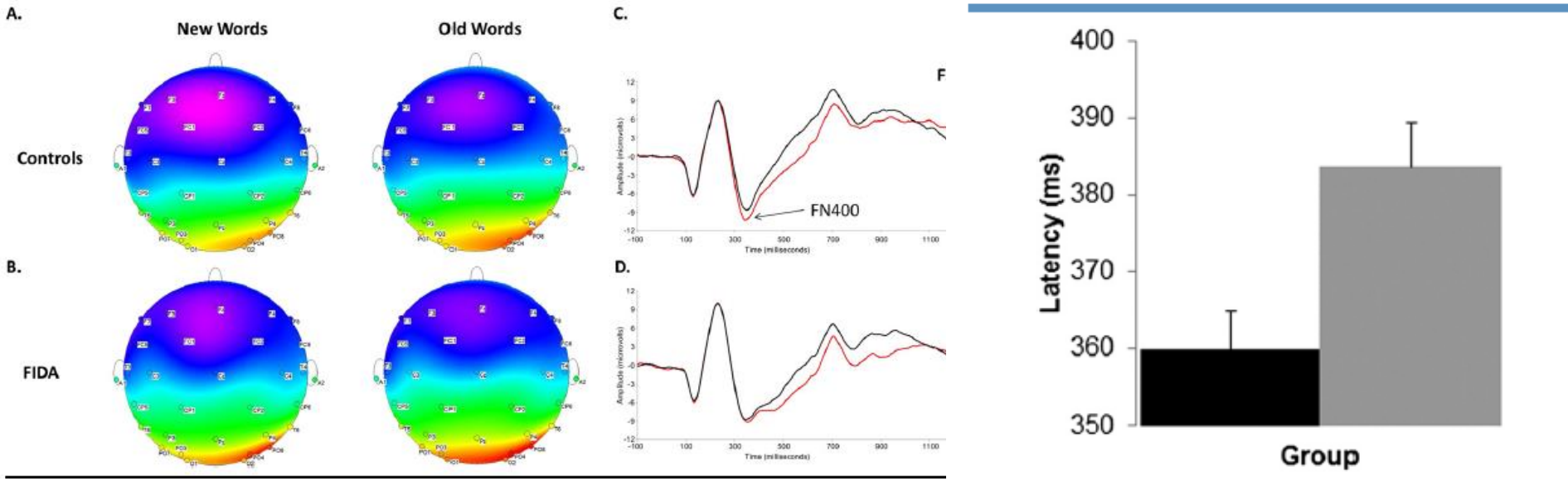
Iron Deficiency in Infancy is Associated with Altered Neural Correlates of Recognition Memory at 10 Years

Eliza L. Congdon, BS¹, Alissa Westerlund, BA¹, Cecilia R. Algarin, MD², Patricio D. Peirano, MD, PhD², Matthew Gregas, PhD¹, Betsy Lozoff, MD⁴, and Charles A. Nelson, PhD^{1,3}

Congdon *JPEDS* 2012

Group	FIDA (n = 51)	Control (n = 44)
Child		
Age at test, years	10.2 (.22)	10.2 (.24)
Sex, % female (n)	37.3 (19)	52.3 (23)
Birth weight, g	3496.9 (391.7)	3617.3 (416.8)
Gestational age*	39.3 (1.0)	39.8 (1.2)
Height at 10 years, cm	139.5 (6.6)	138.1 (5.4)
Weight at 10 years, kg	38.8 (9.1)	37.6 (7.6)
Participant IQ	92.1 (10.5)	95.6 (11.1)
Iron status at 10 years		
Hemoglobin, g/L*	132.4 (9.1)	136.4 (9.3)

Modification de la mémorisation...



Même qualité de réponse aux tests, mais les enfants contrôle ont une rapidité de réponse augmentée.
Altérations EEG des carencés

Carence Martiale & grossesse

- Physio(patho)logie
- Epidémiologie – diagnostic
- Faut-il traiter ?
- Fer per os vs IV ?

Carence Martiale & grossesse

- **Physio(patho)logie**
- Épidémiologie
- Faut-il traiter ?
- Fer per os vs IV ?

Besoins en FER de la grossesse

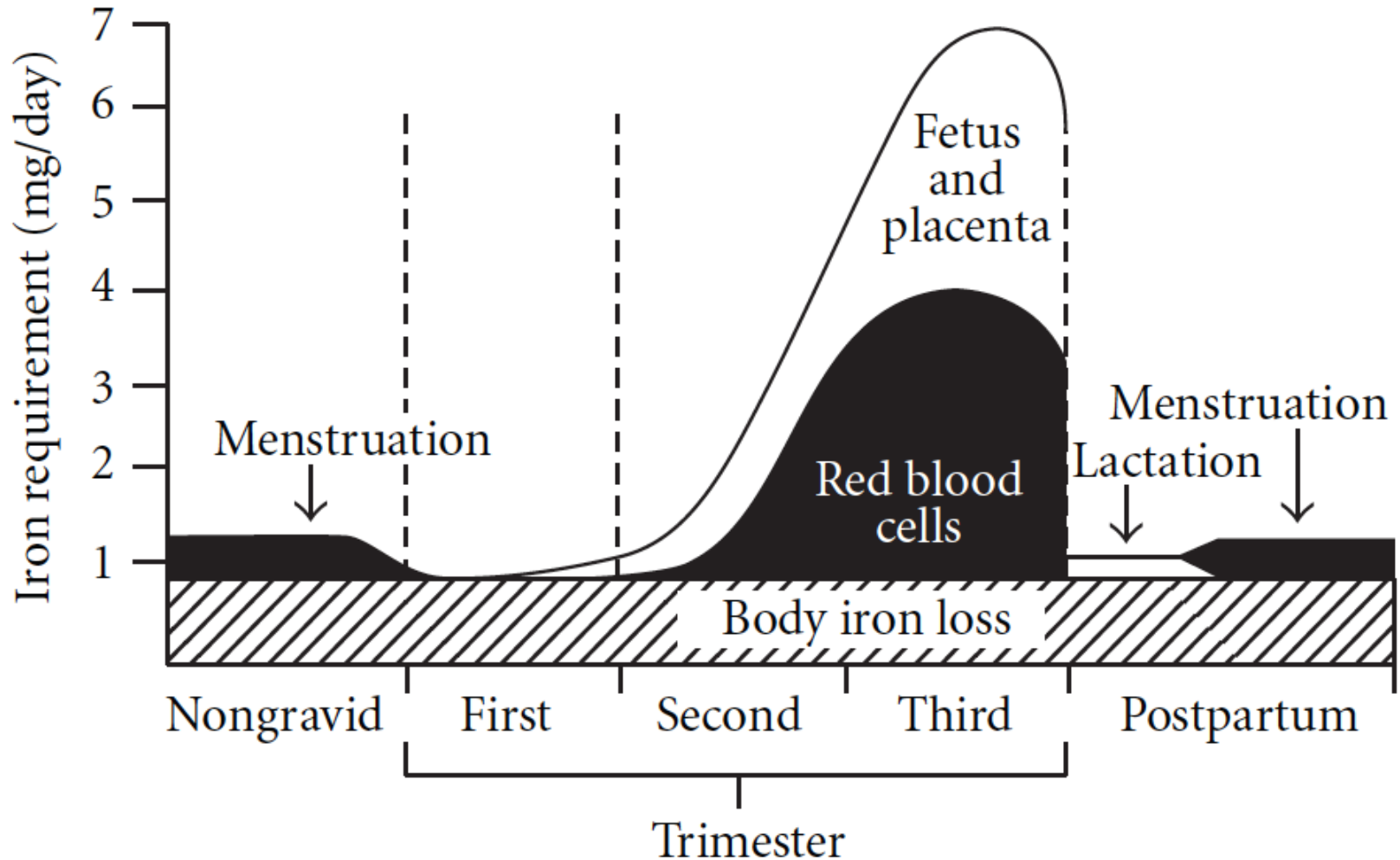


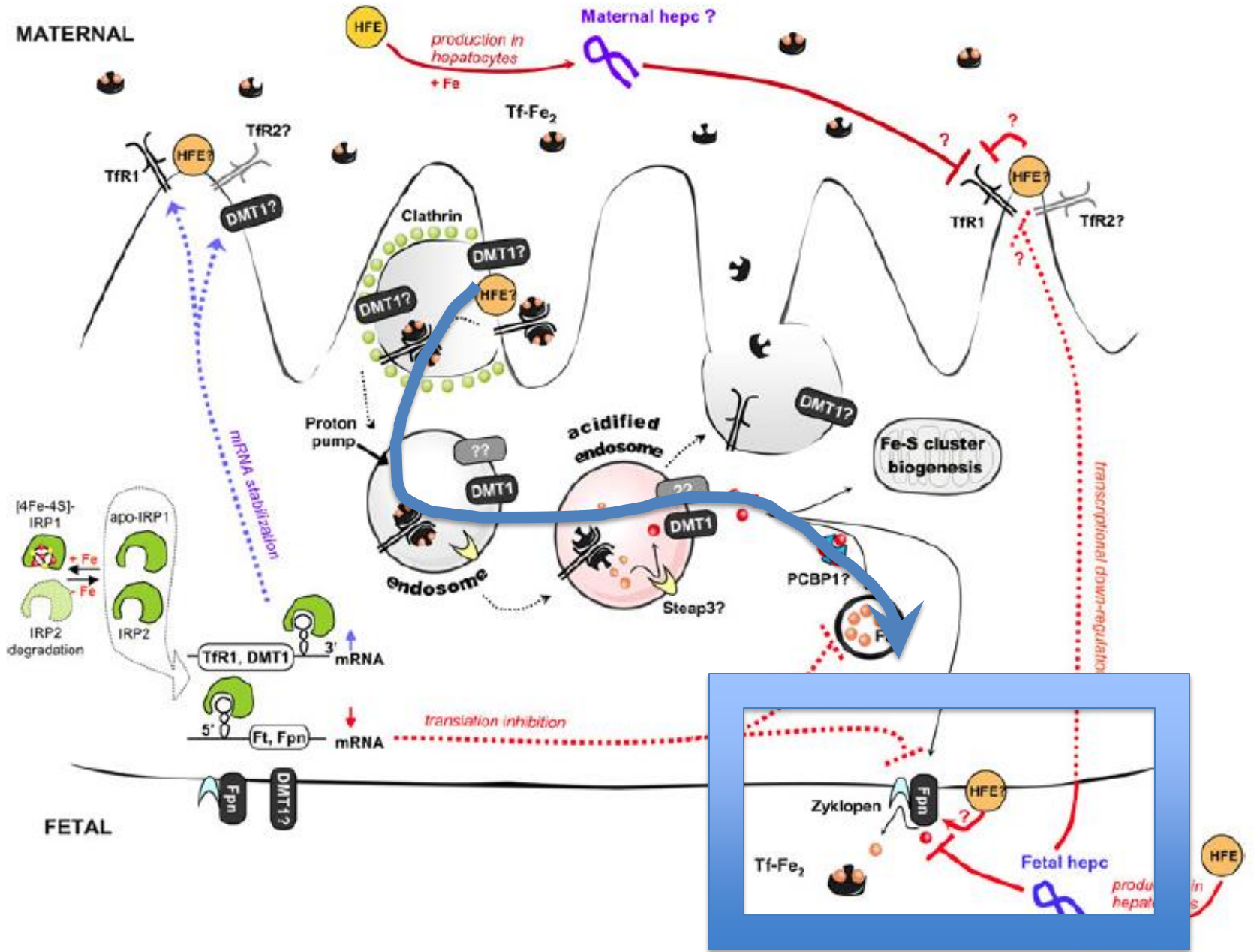
TABLE 1: Iron balance in normal pregnancy and delivery, approximate figures.

Gross iron demands	
Obligatory iron loss (0.8 mg × 290 days)	230 mg
Increase in red cell mass	450 mg
Newborn baby (weight 3500 g)	270 mg
Placenta and umbilical cord	90 mg
Blood losses at delivery	200 mg
Total gross	1240 mg
Net iron demands	
Menostasia in pregnancy	–160 mg
Postpartum decrease in red cell mass	–450 mg
Total net iron demands	630 mg

1 µg/L ferritine ≈ 140 µg/kg Réserves en FER

Besoins minimum 500 mg

Pour un poids de 40–50 kg il faut une ferritine > 50 - 70 µg/L



- **Les besoins en fer sont augmentés pendant la grossesse (500-850 mg):**
 - *Augmentation volume sanguin + Besoins Fœtus*
 - *Jusqu'à 25-30 mg/jour*
 - *Compensés par une augmentation de la l'absorption*
- **Régulation du métabolisme privilégie le fœtus**

Carence Martiale & grossesse

- Physio(patho)logie
- **Epidémiologie – Diagnostic**
- Faut-il traiter ?
- Fer per os vs IV ?

Les marqueurs biologiques « standards »

Table 2 Laboratory Abnormalities in Iron Deficiency

	Laboratory Test	Laboratory Finding
<p>Early changes</p> <p>Late changes</p>	Ferritin	<40 µg/L
	Serum iron	<50 µg/dL
	Transferrin saturation	<15%
	Total iron-binding capacity	>450 µg/dL
	Red cell count	<4 × 10 ⁶ /mm ³
	Red cell distribution width	>14.5%
	Mean corpuscular volume	<80 fl
	Hemoglobin	<13 g/dL, males <12 g/dL menstruating females

Ferritine basse
=
Réserves basses

Tsat basse
=
Défaut d'apport

Recommandations pour le diagnostic de la carence martiale: HAS 2011

Prendre en compte le contexte clinique et réaliser préalablement l'hémogramme

Ferritinémie

OUI

- En **première intention** lors d'une recherche de carence en fer
- Elle est témoin des réserves en fer
- Si son taux est diminué, inutile de rechercher un autre marqueur

Reco pour CM en gynéco:

- *Ferritine < 12 à 30 µg/L*
- *Mais réserves > 500 mg = Ferritine >70 µg/L pour une femme de 50 kg*

Coefficient de Saturation de la Transferrine (CST)

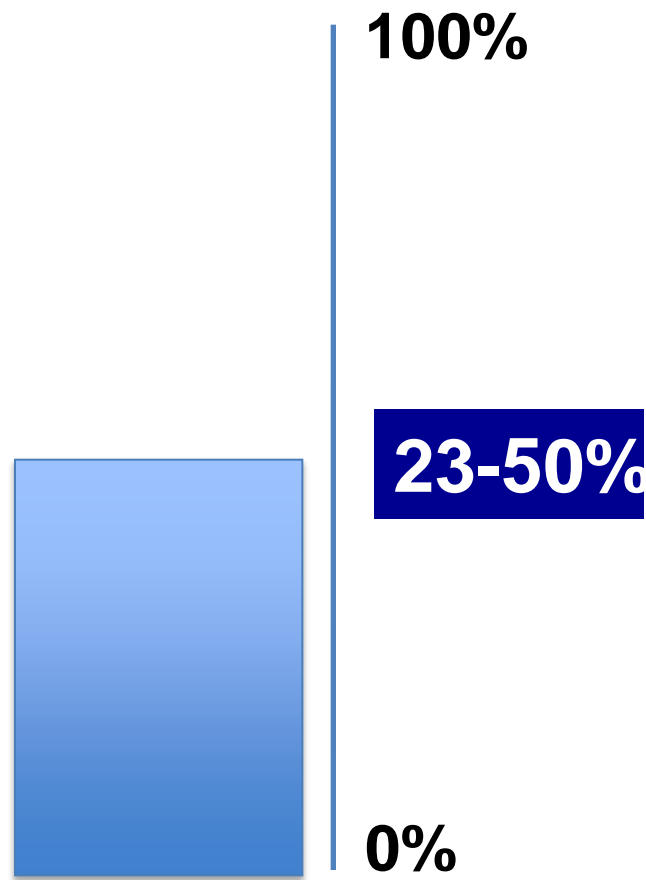
Fer seul

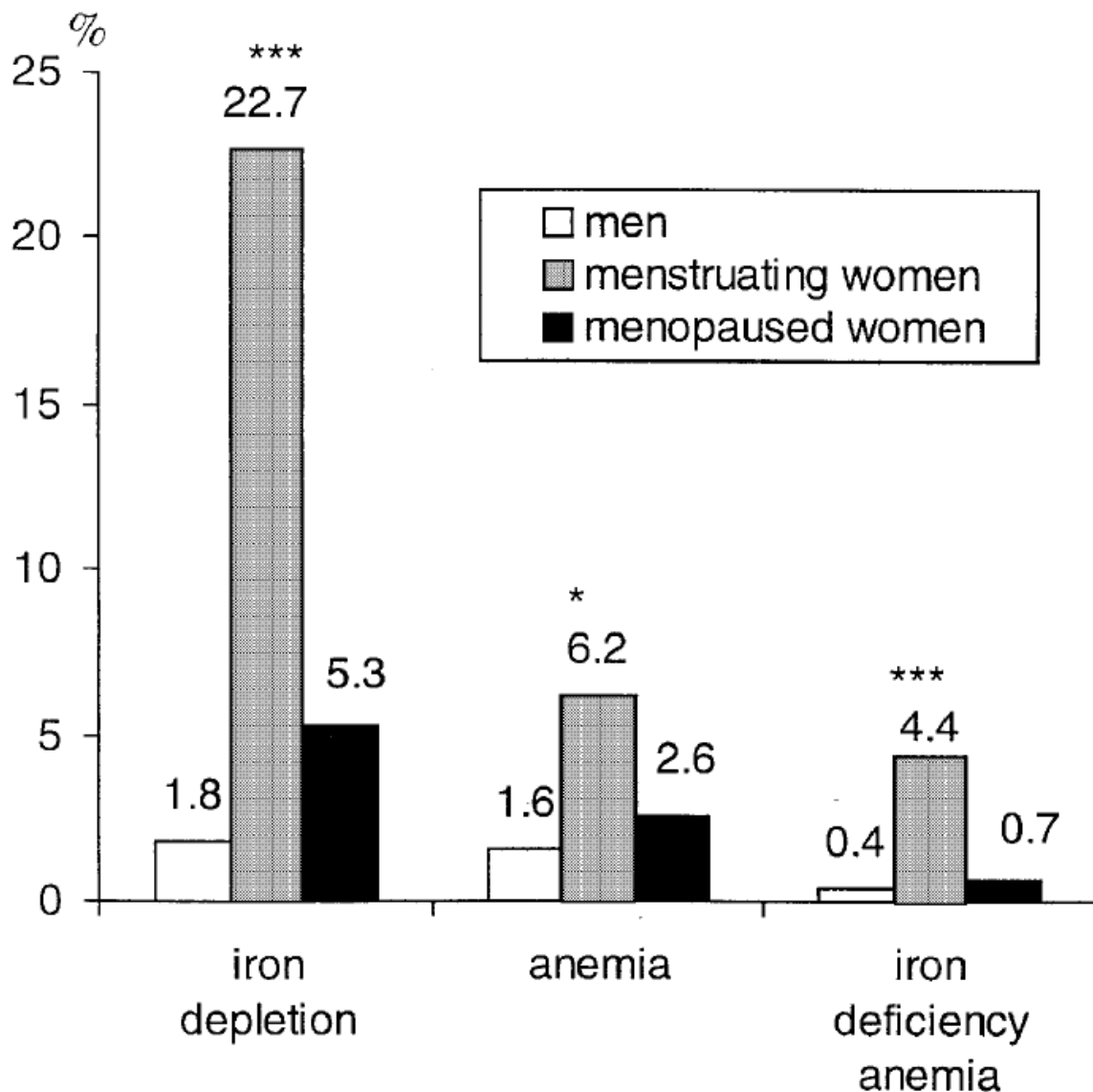
NON

Fer + Ferritine

- Le dosage du fer seul est **moins informatif** que celui de la ferritine (importante variabilité nyctémérale)
- Le dosage du fer en plus de celui de la ferritine n'apporte pas d'informations supplémentaires

CM chez la femme en age de procréer?





Étude française de population SU.VI.MAX

n= 5447

CM = $Ferr < 30$

Etude coréenne:

n=6758

CM= 31% et anémie

11,5% chez femmes

en age de procréer

(Lee JKMS 2014)

Etude suisse (n=58,

employées hôpital)

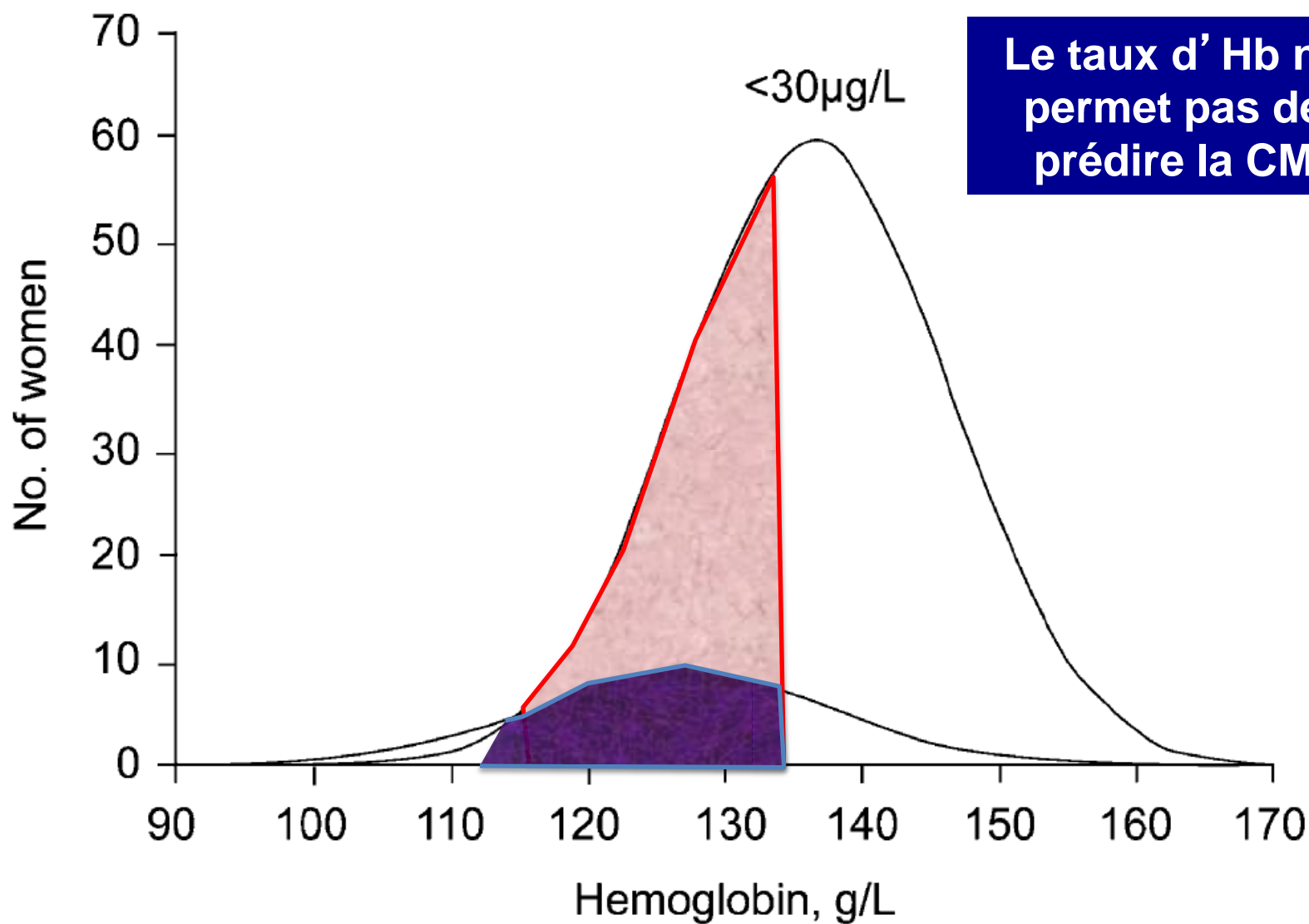
50% de CM

(Schuepbach *Int J*

Biomed Sci 2011)

Galan *Eur J Clin Nutr* 1998

Ferritine et taux d' Hb (*femmes non enceinte*)

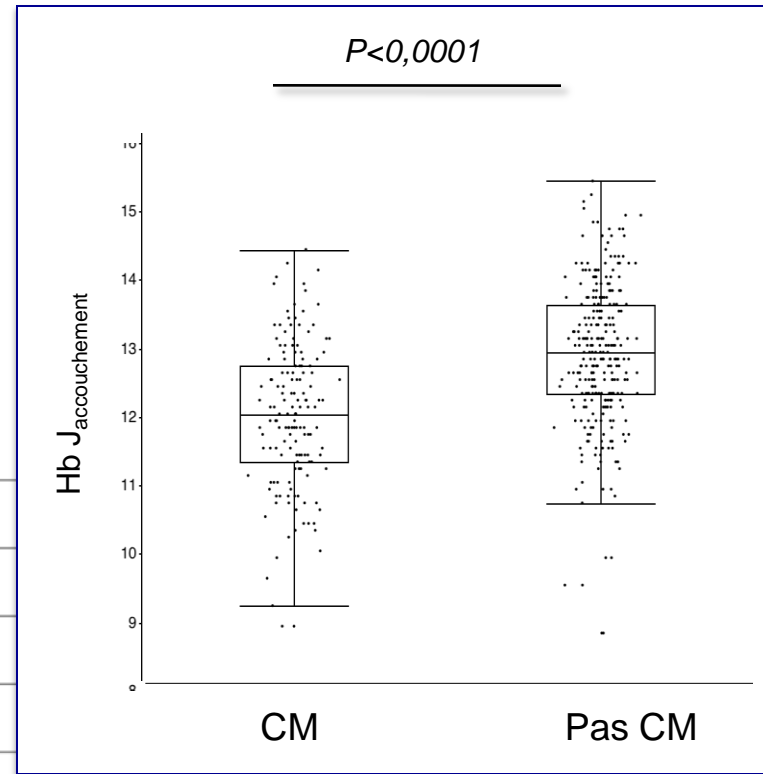
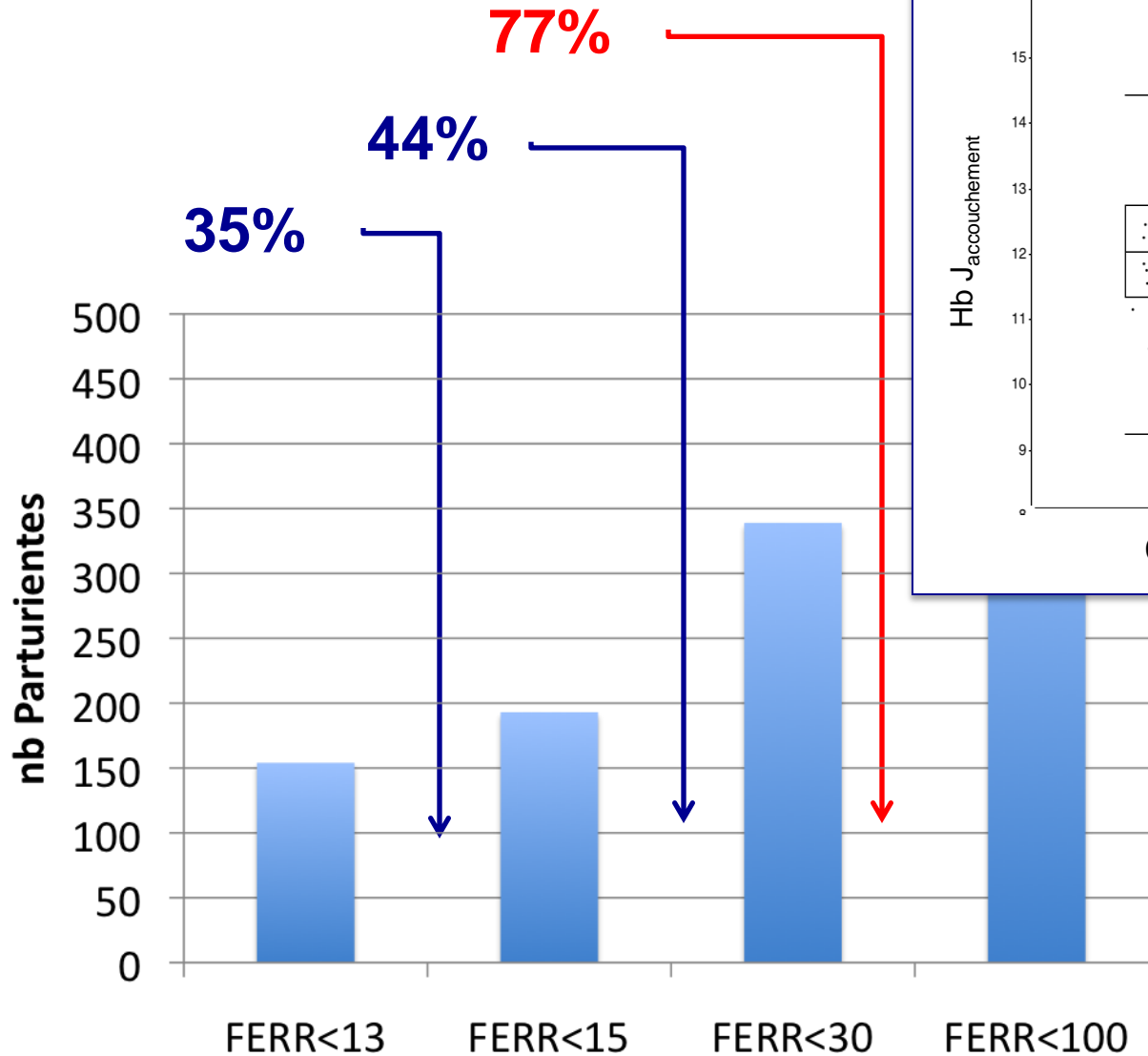


	All women	First trimester	Third trimester	Wallonia ^b	Flanders ^b
Hb^c (g/dL)	n=1,287	n=625	n=659	n=449	n=629
Median	12.3	12.8*	11.9	12.4	12.4
IQR ^d	11.5-13.0	12.1-13.3	11.1-12.5	11.5-13.0	11.6-13.0
95% CI ^e	12.3-12.4	12.7-12.8	11.7-11.9	12.2-12.4	12.3-12.5
Minimum	7.8	7.8	7.9	7.9	7.8
Maximum	15.6	15.6	14.8	15.5	14.8
% <11.0 g/dL (anemia)	13.1	4.2*	21.4	14.5	11.5

	All women	First trimester	Third trimester
95% CI	5.56-6.26	7.98-8.43	3.32-4.02
Minimum	-5.22	-3.70	-5.23
Maximum	15.20	15.20	13.66
% Iron deficient, nonanemic^k (%)	14.1	4.2*	23.4
SF Iron-deficiency anemia^l (%)	9.3	1.9*	16.2

% <12.0 μg/L	15.0	3.5*	25.6	15.1	14.5
% <15.0 μg/L	23.4	6.1*	39.6	26.1	21.5
% >70.0 μg/L	14.0	27.5*	1.2	12.7	15.6
sTfr^h (μg/mL)	n=1,280	n=619	n=659	n=449	n=623
Median	3.7	3.2*	4.3	3.7	3.6
IQR	3.0-4.8	2.7-3.9	3.4-5.6	3.0-5.0	3.0-4.7

Et à Angers...



456 femmes enceintes, Bilan FER le jour de l'accouchement, suivi J28

- **CM chez les femmes jeunes en age de procréer ($Ferr < 30 \mu\text{g/L}$): 20-50 %**
- **Femmes n'ayant pas une réserve en fer suffisante ($Ferr < 50-70 \mu\text{g/L}$): 56 – 80%**
- **CM en fin de grossesse ($Ferr < 15 \mu\text{g/L}$): 40 - 50%**

Carence Martiale & grossesse

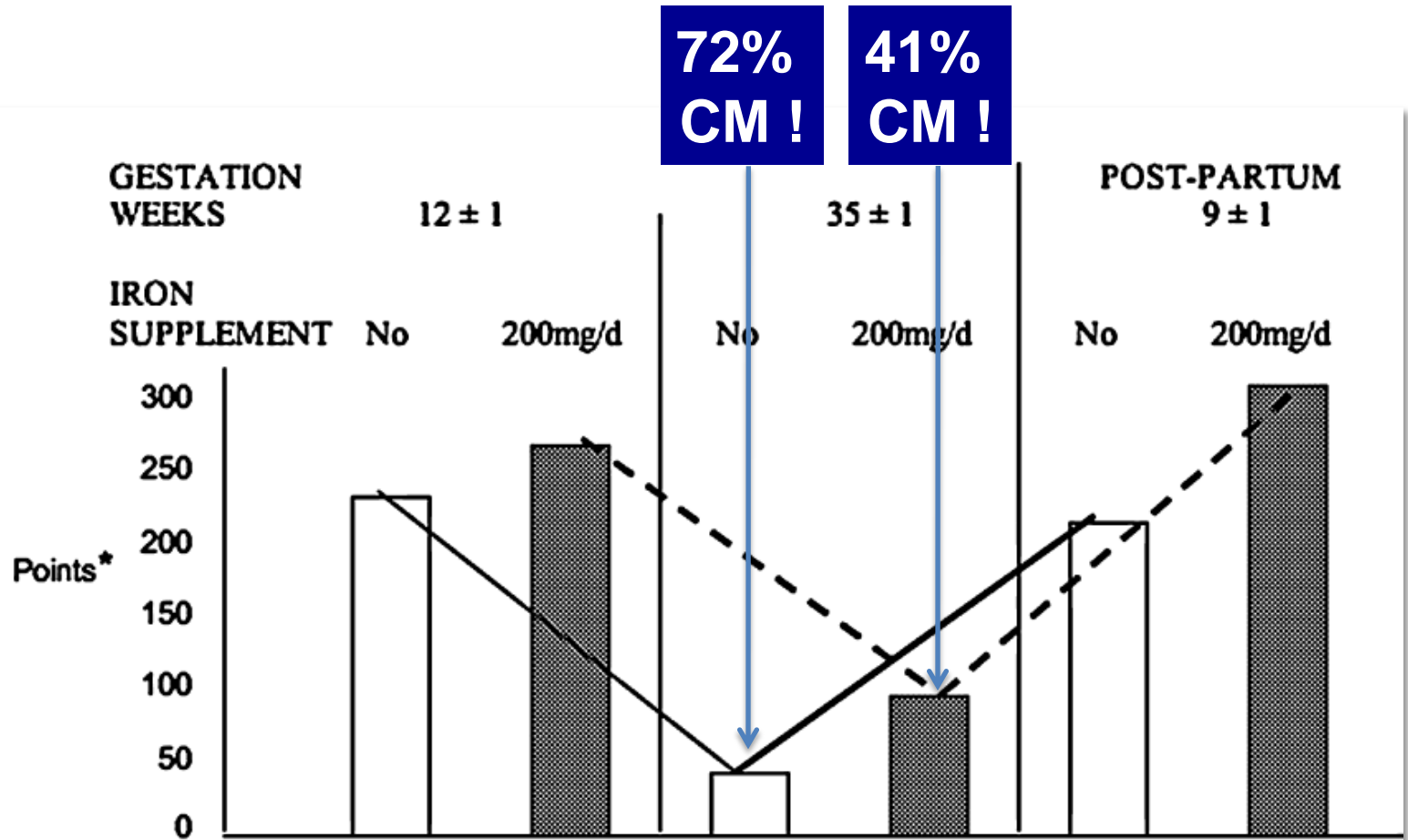
- Physio(patho)logie
- Epidémiologie – Diagnostic
- **Faut-il traiter ?**
- Fer per os vs IV ?

TTT Fer durant la grossesse

Table 1. Characteristics of the first- (n=640) and third- (n=666) trimester pregnant women included in the study (n=1,306) (Belgian national survey on iron status in pregnant women, 2010-2011)

Characteristic	First-Trimester Women (n=640)		Third-Trimester Women (n=666)	
	n	(mean±SD ^a)	n	(mean±SD ^a)
Age (y)	639	28.3±5.1	664	28.8±5.1
Gestational weeks	640	9.9±2.8	666	34.1±3.6
BMI ^{b,c}	635	24.4±5.0	653	24.4±5.1
	n	%	n	%
Supplement use during pregnancy	468	73.1	529	79.8
Iron-containing supplement use	342	53.4*	478	71.8

Effet de la supplémentation



Bone marrow iron during and after pregnancy. * Arbitrary scale by the total sum of points,

Metaanalyse Cochrane

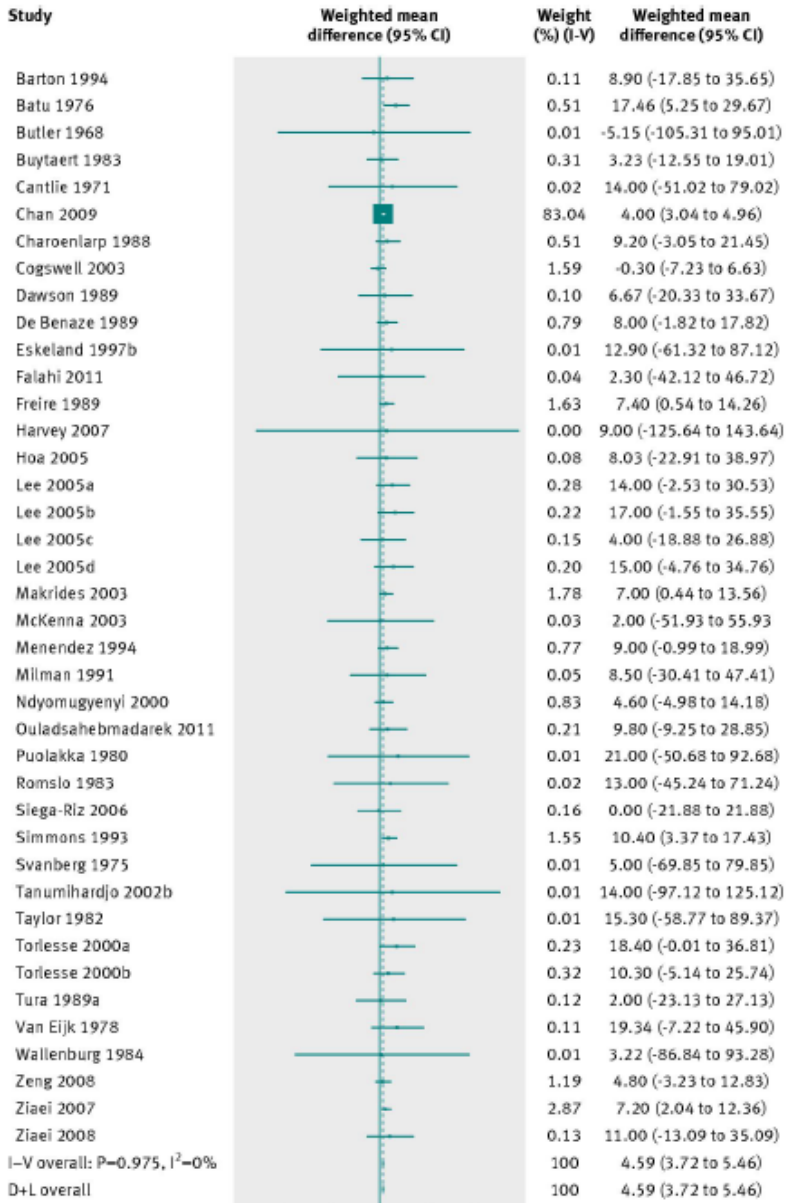
Patient or population: women during pregnancy

Settings: settings including malaria endemic areas

Intervention: any supplements containing iron versus same supplements without iron or no treatment/placebo (no iron or placebo)

Outcomes	Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
Low birthweight (less than 2500 g)	RR 0.81 (0.68 to 0.97)	8480 (11 studies)	moderate ¹	
Maternal anaemia at term (Hb less than 110 g/L at 37 weeks gestation or more)	RR 0.30 (0.19 to 0.46)	2199 (14 studies)	moderate ⁶	
Maternal iron deficiency at term (as defined by as defined by trialists, based on any indicator of iron status at 37 weeks' gestation or more)	RR 0.43 (0.27 to 0.66)	1256 (7 studies)	moderate ⁷	

Fer oral & Hb



- 36 études
- +4,6 g/l [3,7-5,5]
- Réduction risque anémie de 50%

Métaanalyse FER & Grossesse

Table 1| Summary of effects of iron use on haematological and pregnancy outcomes

Haematological outcomes (in third trimester or at delivery)	All trials					High quality trials				
	No of trials	WMD or RR (95% CI)	Significance of effect (P value)	Test for heterogeneity (P value)	I ² (%)	No of trials	WMD or RR (95% CI)	Significance of effect (P value)	Test for heterogeneity (P value)	I ² (%)
Haemoglobin (g/L)	36	4.59 (3.72 to 5.46)	<0.001	0.98	0	15	4.20 (3.17 to 5.22)	<0.001	0.95	0
Anaemia	19	0.50 (0.42 to 0.59)	<0.001	<0.001	83	8	0.66 (0.57 to 0.76)	<0.001	<0.001	72
Iron deficiency	8	0.59 (0.44 to 0.79)	<0.001	<0.001	79	5	0.70 (0.55 to 0.91)	<0.001	0.001	79
Iron deficiency anaemia	6	0.40 (0.26 to 0.60)	<0.001	0.18	33	4	—	—	—	—
Pregnancy outcomes										
Birth weight (g)	19	41.21 (1.20 to 81.23)	<0.001	<0.001	99	12	68.67 (37.67 to 99.68)	<0.001	<0.001	97
Low birth weight	13	0.81 (0.71 to 0.93)	0.001	0.44	1	7	0.82 (0.72 to 0.94)	0.003	0.15	37
Gestational age (weeks)	10	0.11 (-0.35 to 0.57)	0.64	1.00	0	6	0.12 (-0.36 to 0.60)	0.63	1.00	0
Preterm birth	12	0.84 (0.68 to 1.03)	0.09	0.68	0	9	0.84 (0.68 to 1.05)	0.12	0.67	0
Small for gestational age birth	8	0.85 (0.67 to 1.08)	0.17	0.02	59	6	0.84 (0.62 to 1.14)	0.26	0.005	70
Birth length (cm)	8	-1.08 (-4.97 to 2.80)	0.58	0.76	0	6	-1.15 (-5.15 to 2.84)	0.58	0.41	0

RR=relative risk; WMD=weighted mean difference.

Relation « dose effet »

Table 4 | Summary of exposure-response relations with haematological and birth outcomes (trials)

Exposure: increase in iron dose (10 mg/day)	No of trials	WMD or RR (95% CI)	P value
Maternal anaemia			
All trials	18	0.99 (0.990 to 0.995)	<0.001
All trials (excluding trial with iron dose 900 mg/day)	17	0.93 (0.91 to 0.94)	<0.001
Trials with iron dose up to 66 mg/day	11	0.88 (0.84 to 0.92)	<0.001
Low birth weight			
All trials	13	0.97 (0.95 to 0.98)	<0.001
Trials with iron dose up to 66 mg/day	11	0.96 (0.95 to 0.98)	<0.001

Dose optimal autour de 60 mg de fer élément

Intérêt de la prise alternée

Any Intermittent oral iron supplementation versus any daily iron supplementation for women during pregnancy

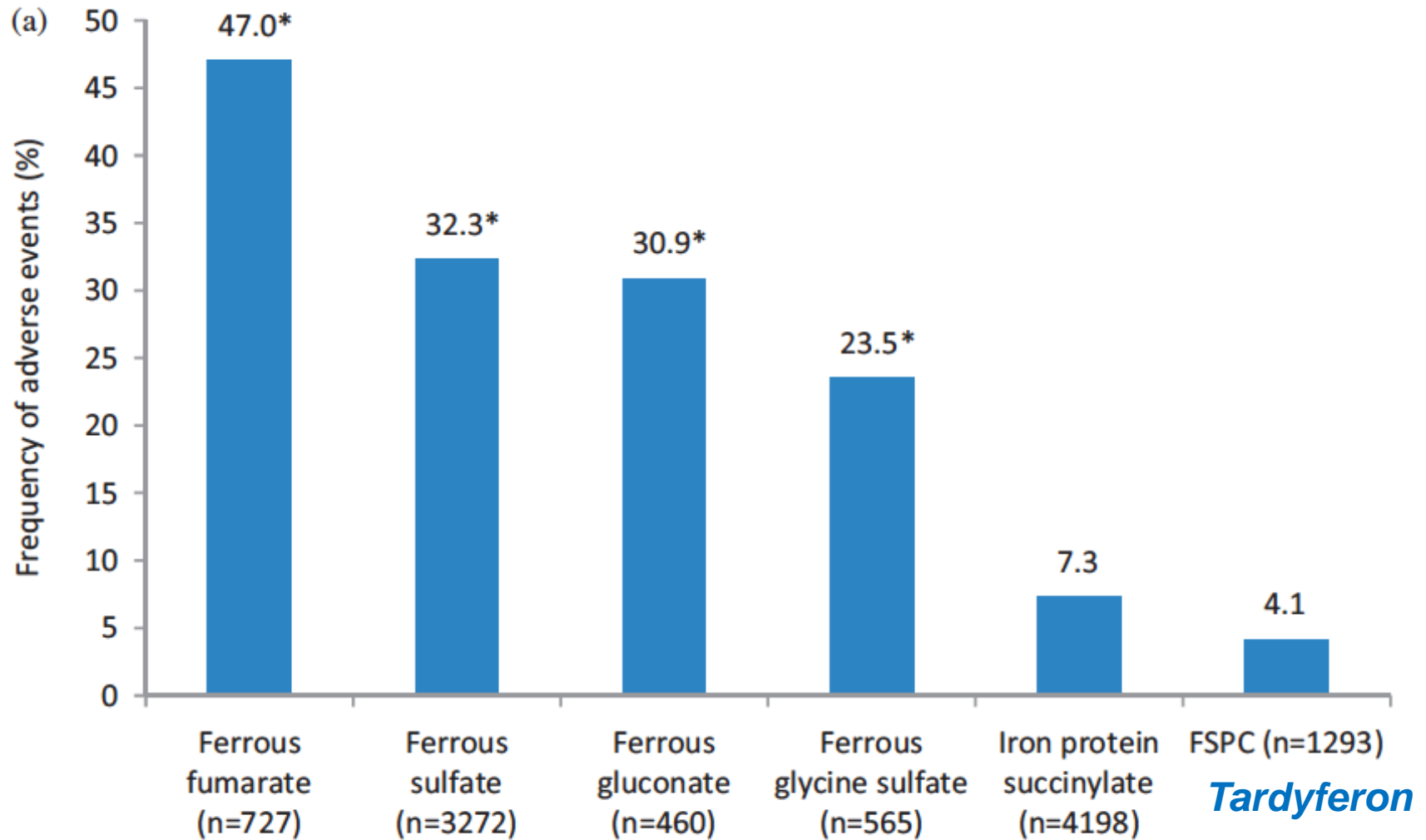
Patient or population: women during pregnancy

Settings: community settings

Intervention: any intermittent oral iron supplementation versus any daily iron supplementation

Outcomes	Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
Low birthweight (less than 2500 g)	RR 0.96 (0.61 to 1.52)	1111 (7 studies)	⊕○○○ very low ¹	
Anaemia at term (Hb < 110 g/L at 37 wk gestation or more)	RR 1.22 (0.84 to 1.80)	676 (4 studies)	⊕○○○ very low ¹	
Side effects (any reported throughout intervention period)	RR 0.56 (0.37 to 0.84)	1777 (11 studies)	⊕○○○ very low ³	

Fréquence des EI en fonctions des Fers Oraux



111 études, 10695 pts

D'après Concelo-Hidalgo *Curr Med Res Opin* 2013

- **La supplémentation martiale réduit le risque d'anémie, de CM et de petit poids de naissance**
- **Effet idem pour prise alternée avec moins d'EI?**
- **Dose: autour de 60 mg (tardyferon?)**
- **Début: 1^{er} trimestre?**

Carence Martiale & grossesse

- Physio(patho)logie
- Epidémiologie – Diagnostic
- Faut-il traiter ?
- **Fer per os vs IV ?**

Fer Oral vs Fer IV

Fer Oral

- Beaucoup moins cher
- Tolérance limitée
 - 30-60% effets II^{aires}
- Observance?
- *Risque de stress oxydant?*

Fer IV

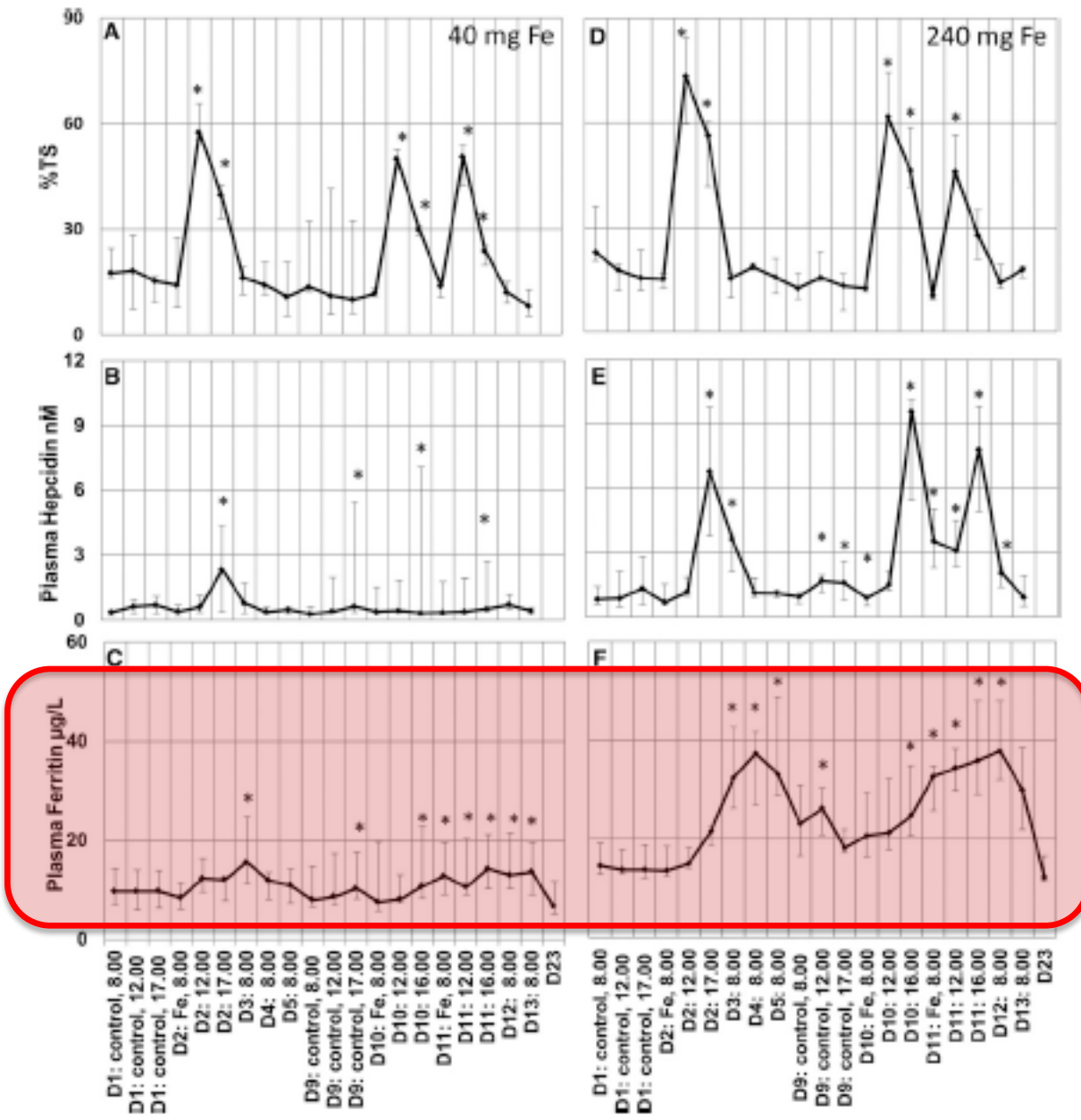
- Efficacité supérieur
- Effets secondaires sévère
 - Anaphylaxie
- Nécessite une voie veineuse
 - Problème pour doses « répétées »
- Pas bcp d' études pour évaluer la toxicité materno-foetale

L'absorption du FER oral est limitée

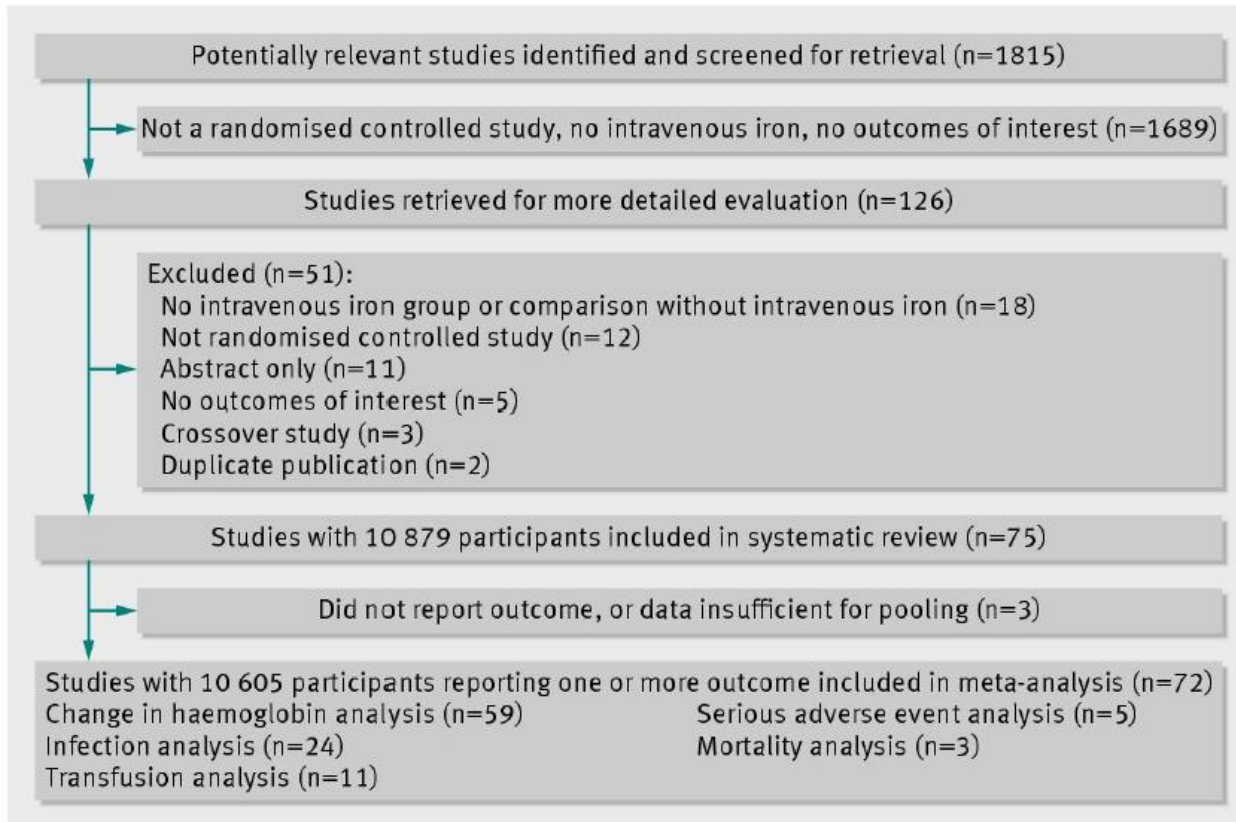
Table 1. Iron absorption and iron status markers with increasing oral doses of FeSO₄ in young women (study 1)

Fe dose (mg)	Day	Iron bioavailability		Iron status					
		Fractional Fe absorption (%)*	Fe absorbed (mg)*	PHep (nM)*	Plasma Fe (µg/mL)†	Transferrin saturation (%)‡	PF (µg/L)*	sTfR (mg/L)‡	Body iron stores (mg/kg BW)‡
40	1	NA	NA	0.30 (0.12-0.48)	0.63 (0.34)	20.9 (15.1)	10.0 (3.4-21.8)	8.2 (4.2)	-0.05 (3.7)
	2	22.7 (14.7-57.1)	9.1 (5.8-22.8)	0.35 (0.11-0.77)	0.55 (0.35)	16.5 (11.7)	9.1 (4.9-25.4)	8.4 (3.8)	-0.8 (3.7)
	9	19.4 (15.8-22.9)	7.8 (6.3-9.2)	0.59 (0.19-4.6)	0.67 (0.61)	21.3 (24.6)	10.3 (5.1-40.8)	7.1 (3.2)	0.11 (4.1)
	10	16.7 (11.8-20.7)‡	6.7 (4.7-8.3)‡	0.45 (0.05-4.3)	0.60 (0.4)	18.6 (16.3)	15 (8.4-51.6)	7.8 (3.5)	1.2 (3.6)
	23	NA	NA	ND	ND	ND	7.7 (4.2-20.1)	5.6 (1.9)	-0.64 (2.4)
80	1	NA	NA	0.93 (0.1-3.7)	1.2 (1.1)	29.8 (12.8)	19.4 (6.0-38.4)	4.8 (1.7)	3.5 (3.5)
	2	19.0 (10.5-30.9)	15.2 (8.4-24.7)	0.90 (0.40-2.2)	0.80 (0.40)	21.3 (8.4)	17.7 (6.0-43.6)	4.8 (1.6)	3.5 (3.4)
	9	18.2 (8.5-26.0)	14.6 (8.5-26.0)	1.1 (0.62-2.1)	0.75 (0.41)	20.9 (9.6)	17.7 (6.5-51.1)	4.5 (2.5)	3.6 (3.4)
	10	11.7 (8.4-24.7)§	9.3 (4.8-12.4)§	2.1 (0.98-5.1)¶	0.96 (0.60)	23.5 (12.5)	33 (24.1-55.0)	3.9 (1.7)	5.3 (2.7)
	23	NA	NA	ND	ND	ND	15.2 (7.2-68.3)	2.9 (1.5)	4.8 (3.7)

≈ 10 mg/jour



Métaanalyse Fer iv vs Per os



72 études
10605 patients

Différence en Hb IV > per os

Subtotal: $P < 0.001$, $I^2 = 89\%$



77.9

6.6 (4.9 to 8.2)

Fer IV vs oral

Table 2 Mean values of blood results before and after iron treatment

Parameter	Time interval	Group A (oral)	Group B (iv)	P-value
Hemoglobin (g/dL)	Pre-treatment	7.6 ± 0.8	7.7 ± 0.5	NS
	Day 7	8.4 ± 0.8	8.8 ± 0.6	NS
	Day 14	8.9 ± 0.6	9.7 ± 0.8	NS
	Day 21	9.6 ± 0.9	10.9 ± 0.8	0.009
	Day 30	10.7 ± 0.7	12.8 ± 1.1	0.002
	At delivery	11.2 ± 0.9	13.4 ± 0.9	0.002
	Ferritin (ng/mL)	Pre-treatment	16.5 ± 5.9	18.1 ± 4.6
	Day 7	22.8 ± 9.8	36.5 ± 8.7	NS
	Day 30	77.6 ± 13.7	104 ± 13.4	0.005
	At delivery	94.6 ± 14.2	128.8 ± 15.8	0.001

**+3,1
g/dl**

**+5,1
g/dl**

n=100, 24-34SA,

Hb 7-9 g/dl; VGM<85 ; Ferr <15 µg/L

Fer sulfate 200 mg (60 mg fer élément) x 3/j pdt 4 sem vs

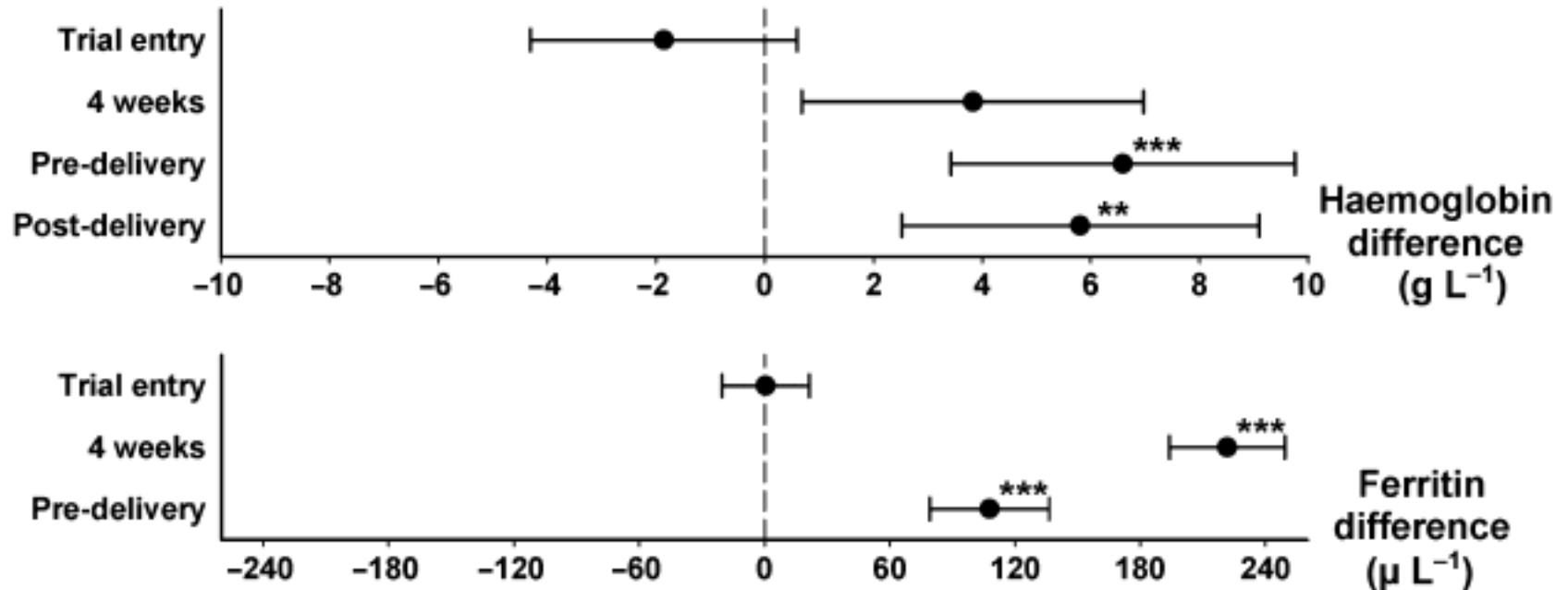
FER sucrose 200 mg/2J jusqu' à dose calculée

Effet secondaires iv per os

Table 3 Adverse effects of iron treatment and neonatal outcome

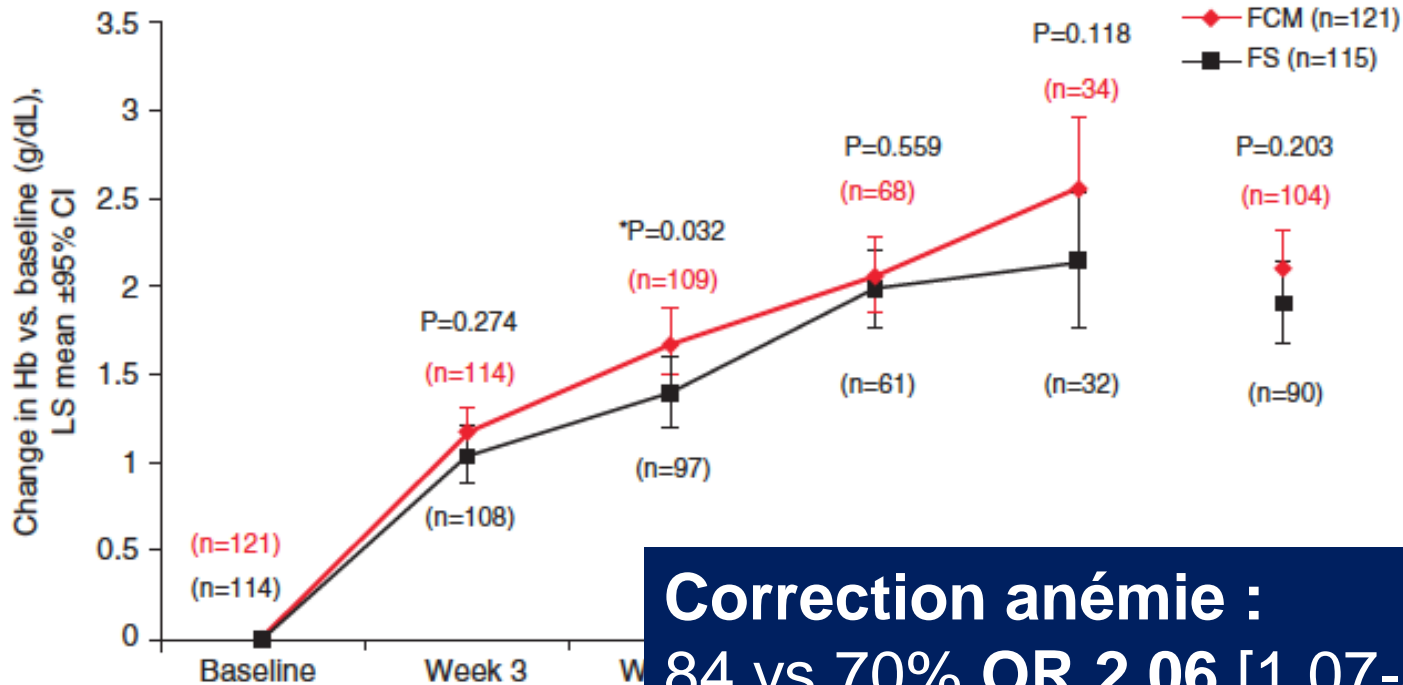
Adverse effect	Group A (per oral)	Group B (iv)	P-value
Headache	1	0	NS
Nausea	3	0	NS
Heartburn	2	1	NS
Hiccup	0	0	NS
Constipation	4	2	NS
Diarrhea	2	0	NS
Neonatal outcome			
Gestational age (weeks)	37 ± 2	38 ± 1	NS
Weight (g)	2695 ± 765	2870 ± 680	NS
Hemoglobin (g/dL)	15.9 ± 2.2	16.3 ± 2.1	NS
Ferritin (ng/mL)	138 ± 98	141 ± 101	NS
Apgar score	7,9,9	7,9,9	NS

Fer iv vs peros pre-partum



- 2nd trimestre, Hb ≤ 11,5 et Ferr < 30 μg/l
- n=196, Fer per os (250 mg) vs IV (≈700 mg) + Per os
- 79 vs 4,5% Ferr basse et 29 vs 16% Hb < 11,5g/dl

Intérêt du FCM



Correction anémie :
 84 vs 70% OR 2,06 [1,07-3,97], p=0,03
 En 3,4 vs 4,3 semaines

252 P, 16-33 SA Hb ≤ 11 g/dl : 126 FCM (1-1,5 g), 126 Fer oral (Sulfate ferreux 100 mg x2/j)

Hb 9,8 g/dl; Ferritine 12 ng/ml

Pas plus d'EI

Table 3: Treatment-related TEAEs by severity.

Treatment-related TEAE severity, number of patients (%)	Ferric carboxymaltose (n=123)	Ferrous sulfate (n=124)
Total	60 (49)	50 (40)
Mild	43 (72)	28 (56)
Moderate	17 (28)	20 (40)
Severe	0 (0)	2 (4)

Réponse au Fer oral à J14 (=+1 g/dl)

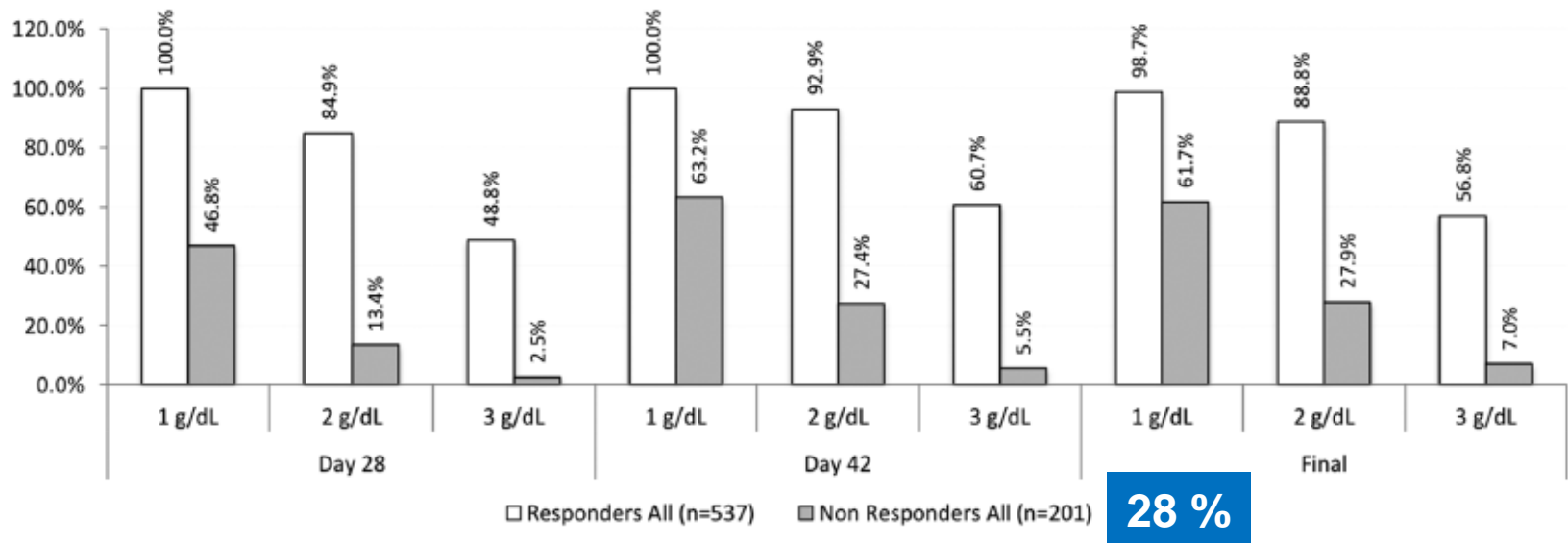


Figure 1. Subsequent hemoglobin trend according to 14-day hemoglobin response. Responders (those with a ≥ 1 g/dL rise in hemoglobin by day 14) were more likely to manifest durable and more robust increments than non-responders (those with < 1 g/dL rise in hemoglobin by day 14).

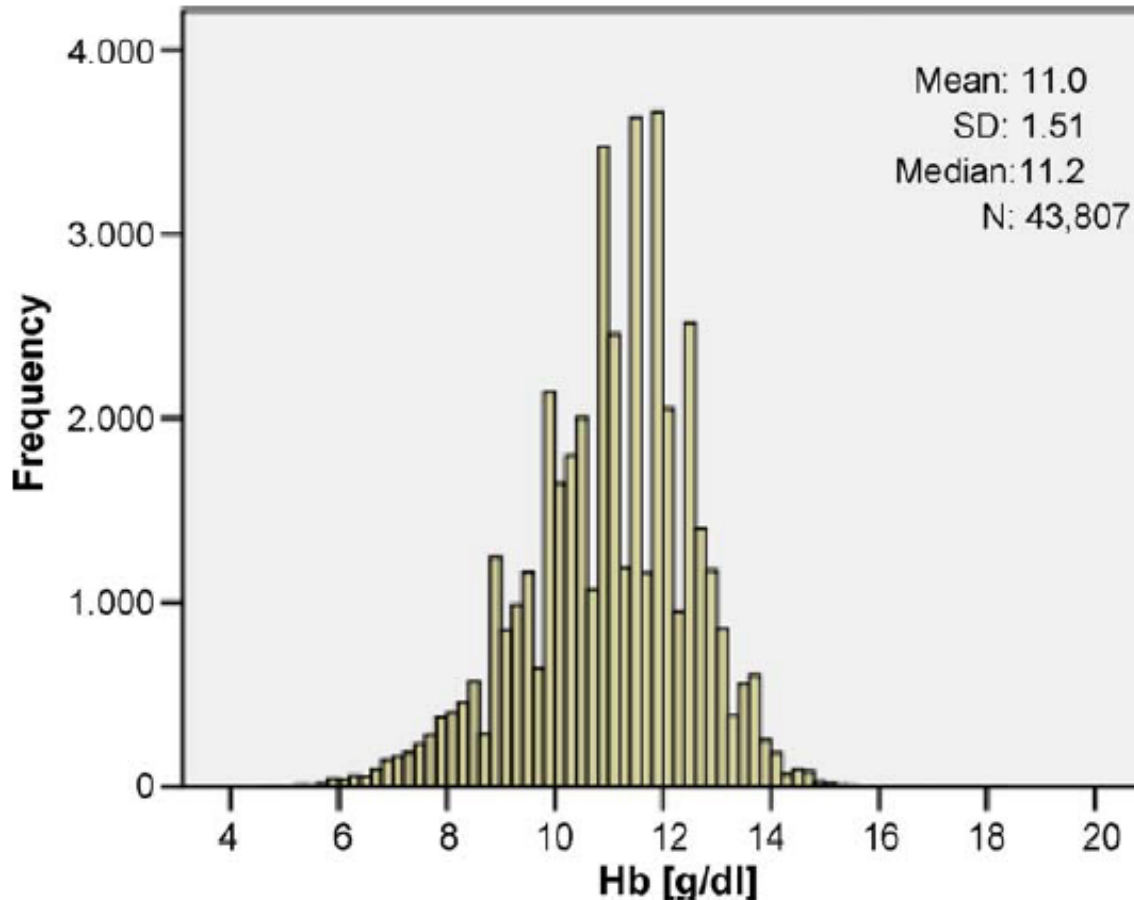
Analyse secondaire de 5 RCT (Iv vs Oral)
738 pts (2 études post-partum, 1 métrorragies)

- **Le FER iv est plus efficace, mais pas beaucoup d'études pour le moment**
- **À réserver aux CM sévères ($\geq 2^{\text{ème}}$ trimestre) \pm intolérance/échec fer oral**
- **Réponse au fer oral évaluable à 2 semaines**

Fer en post-partum ?

Anémie post-partum

R.L. Bergmann et al. / *European Journal of Obstetrics & Gynecology and Reproductive Biology* 150 (2010) 126–131



Percentile	Hb [g/dl]
1	7.0
5	8.3
10	9.0
50	11.2
90	12.8
95	13.3
99	14.1
	Rate [%]
Hb < 8 g/dl	3.4
Hb < 10 g/dl	22.1

Fig. 1. Distribution of hemoglobin concentrations the first day after delivery ($n = 43\,807$ deliveries).

	Hb < 8 g/dl		Model 1		Model 2	
	%	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>
Age mother [years]		ns		0.044		0.005
<18 (Ref.)	4.6		1		1	
18-35	3.4		0.702	0.082	0.620	0.023
>35	3.1		0.601	0.020	0.503	0.003
Anemia in pregnancy	10.1	<0.001	2.675	<0.001	2.724	<0.001
Hemorrhage/thrombosis risk	5.0	ns	1.749	0.013	1.519	0.079
Bleeding > 28 [weeks]	8.5	<0.01	2.097	0.021	1.896	1.896
Placenta previa	17.8	<0.001	4.835	<0.001	2.527	0.004
Hypertension	5.1	<0.05	1.204	0.419	1.013	0.957
Parity		<0.001		0.001		0.001
1	4.0		1.234		1.236	
≥1 (Ref.)	2.8		1		1	
Multiple pregnancy	7.7	<0.001	2.247	<0.001	1.539	0.001
Pregnancy duration [weeks]		<0.001		0.074		0.451
T			1		1	
P			1.220	0.082	1.148	0.254
P			1.211	0.121	1.080	0.555
Birth				<0.001		0.024
<			1		1	
2			1.171	0.282	1.126	0.445
>			1.806	0.001	1.487	0.034
Ne				0.090		0.327
≤			1		1	
4			0.920	0.609	0.811	0.222
≥			1.158	0.033	1.102	0.388
Del				<0.001		<0.001
Vaginal (Ref.)	2.2		1		1	
Manual support/extraction	1.9		1.048	0.927	0.787	0.650
Vacuum	7.9		3.627	0.000	2.361	0.000
Forceps	7.7		3.850	0.000	2.509	0.000
Elective cesarean	4.5		1.883	0.000	0.909	0.382
Emergency cesarean	5.1		2.055	0.000	0.936	0.462
Blood loss [ml]		<0.001				<0.001
<250 (Ref.)	1.0				1	
251-500	3.3				3.278	0.000
501-1000	13.0				15.263	0.000
>1000	43.6				74.670	0.000

- Anémie grossesse
- Placenta praevia
- GG multiple
- Manœuvres, césar...
- Pertes sanguines

Combien de temps pour corriger un saignement de 500 ml?

- 10 jours
- 30 jours
- 60 jours
- 80 jours
- 180 jours
- 360 jours



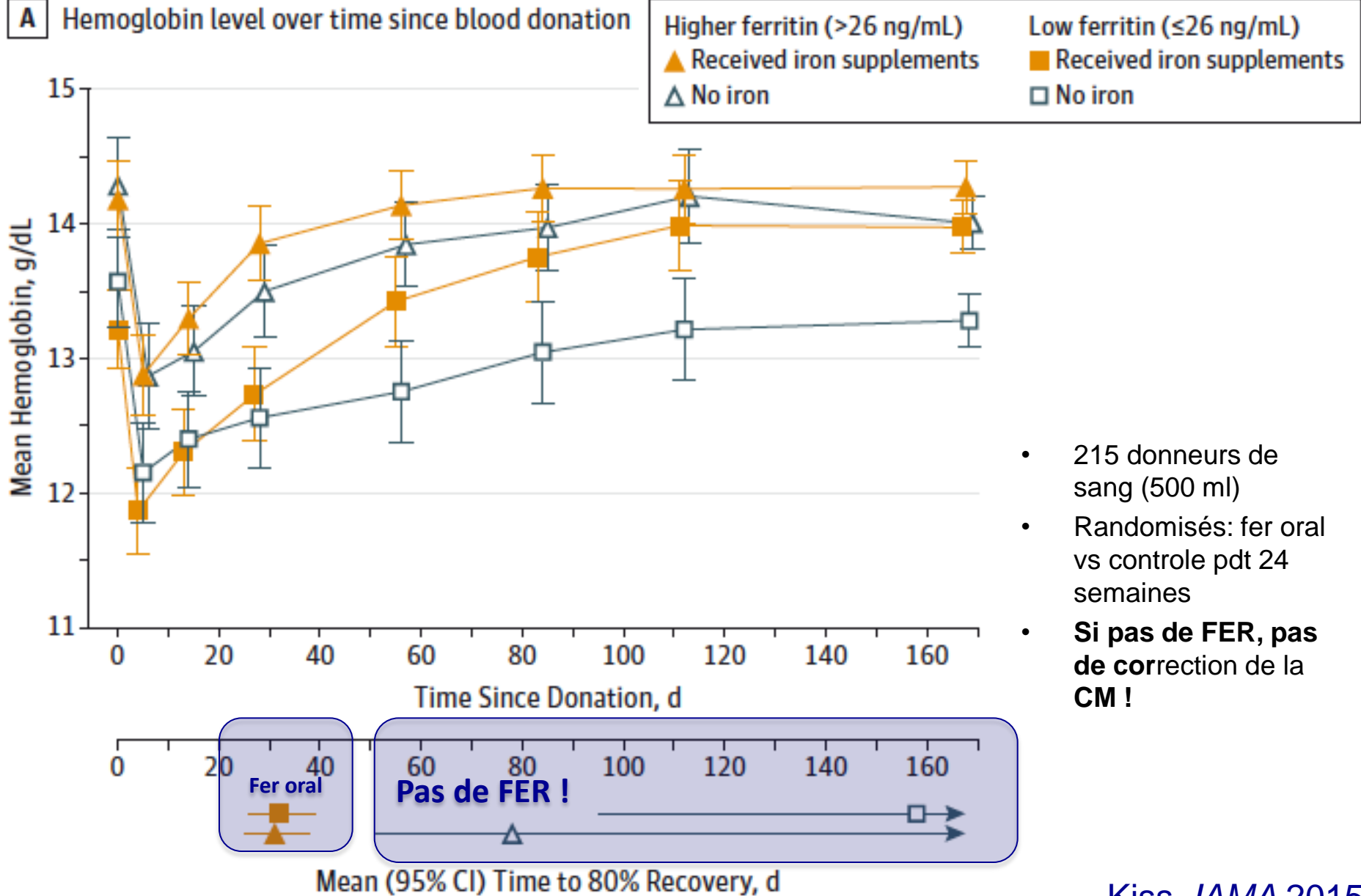
Combien de temps pour corriger un saignement de 500 ml?

- 10 jours
- 30 jours
- 60 jours
- **80 jours**
- **180 jours**
- 360 jours



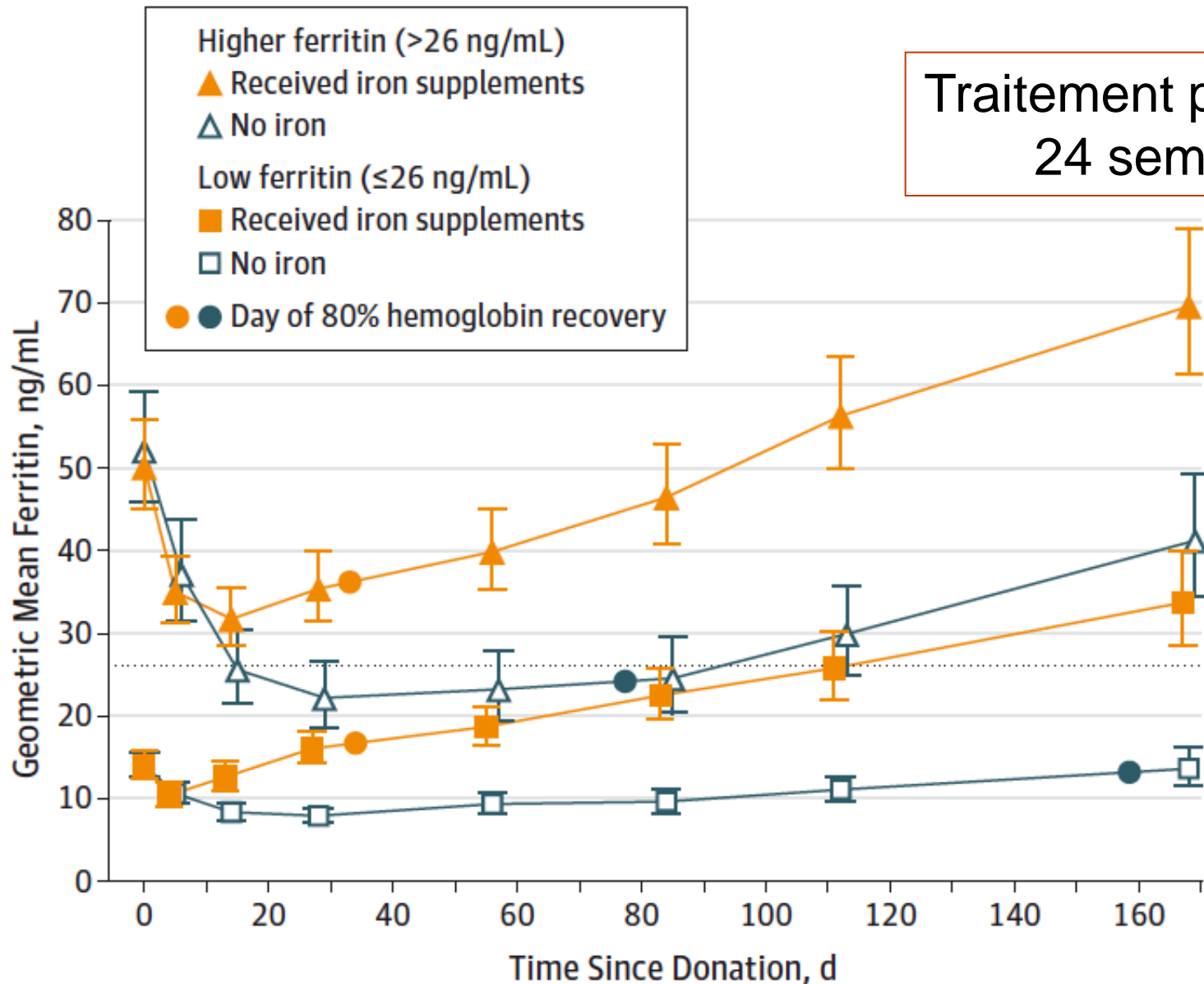
Evolution de l'Hb après don de 500 ml de sang

A Hemoglobin level over time since blood donation



- 215 donneurs de sang (500 ml)
- Randomisés: fer oral vs controle pdt 24 semaines
- **Si pas de FER, pas de correction de la CM !**

Mais pas de correction de la CM !



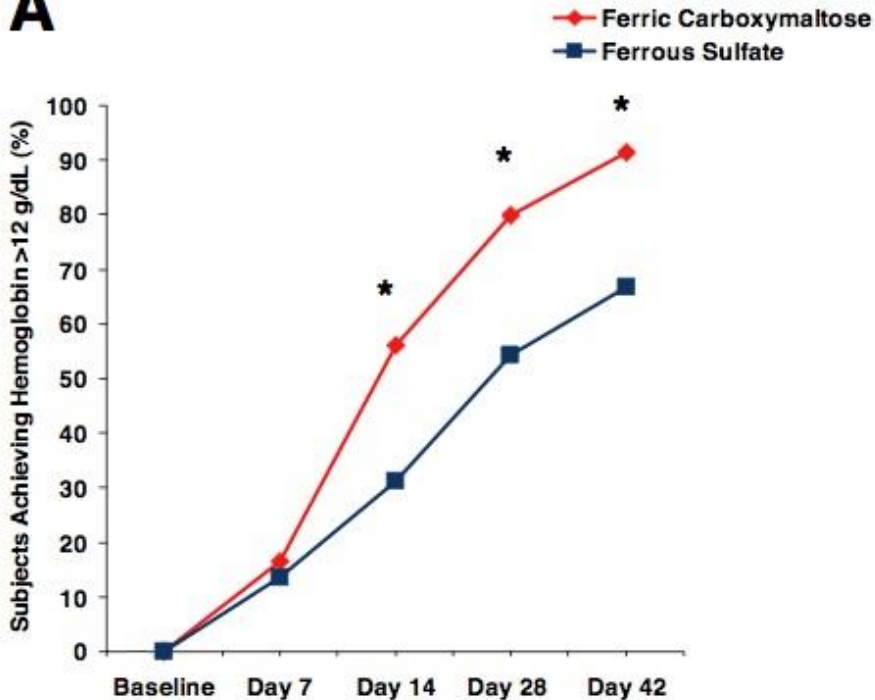
Traitement par fer oral
24 semaines!

Le fer iv permet une correction plus rapide de l'anémie après hémorragie du PP

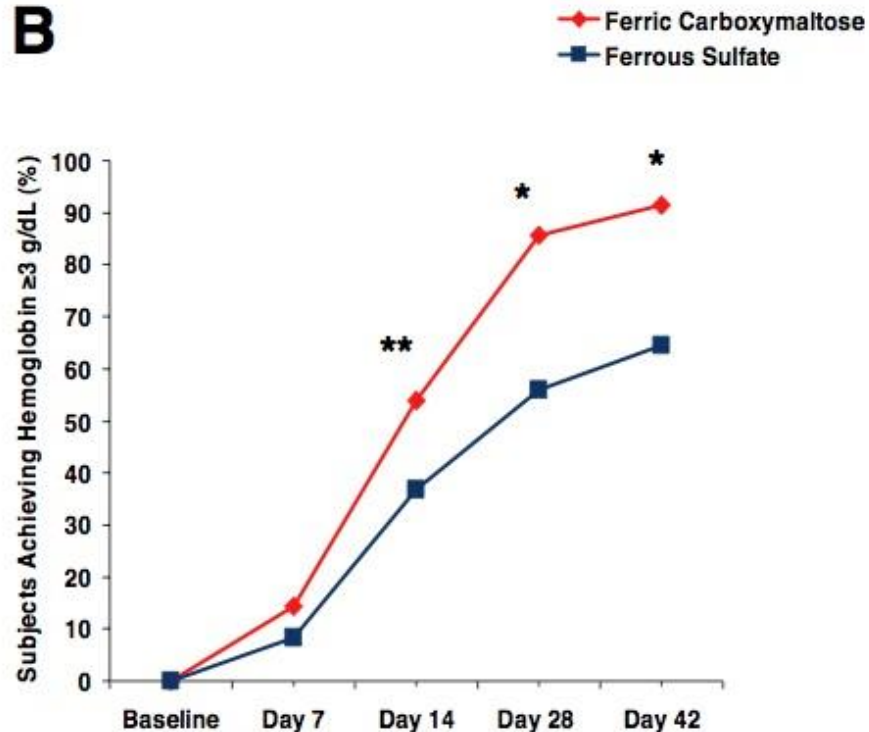
FIGURE 3

Subjects achieving Hb >12 g/dL
and subjects achieving increase in Hb ≥ 3

A



B



- n=291 femmes post-partum (Hb<10g/dl)
- Ferinject 1g vs Fer oral 325mgx3 /j

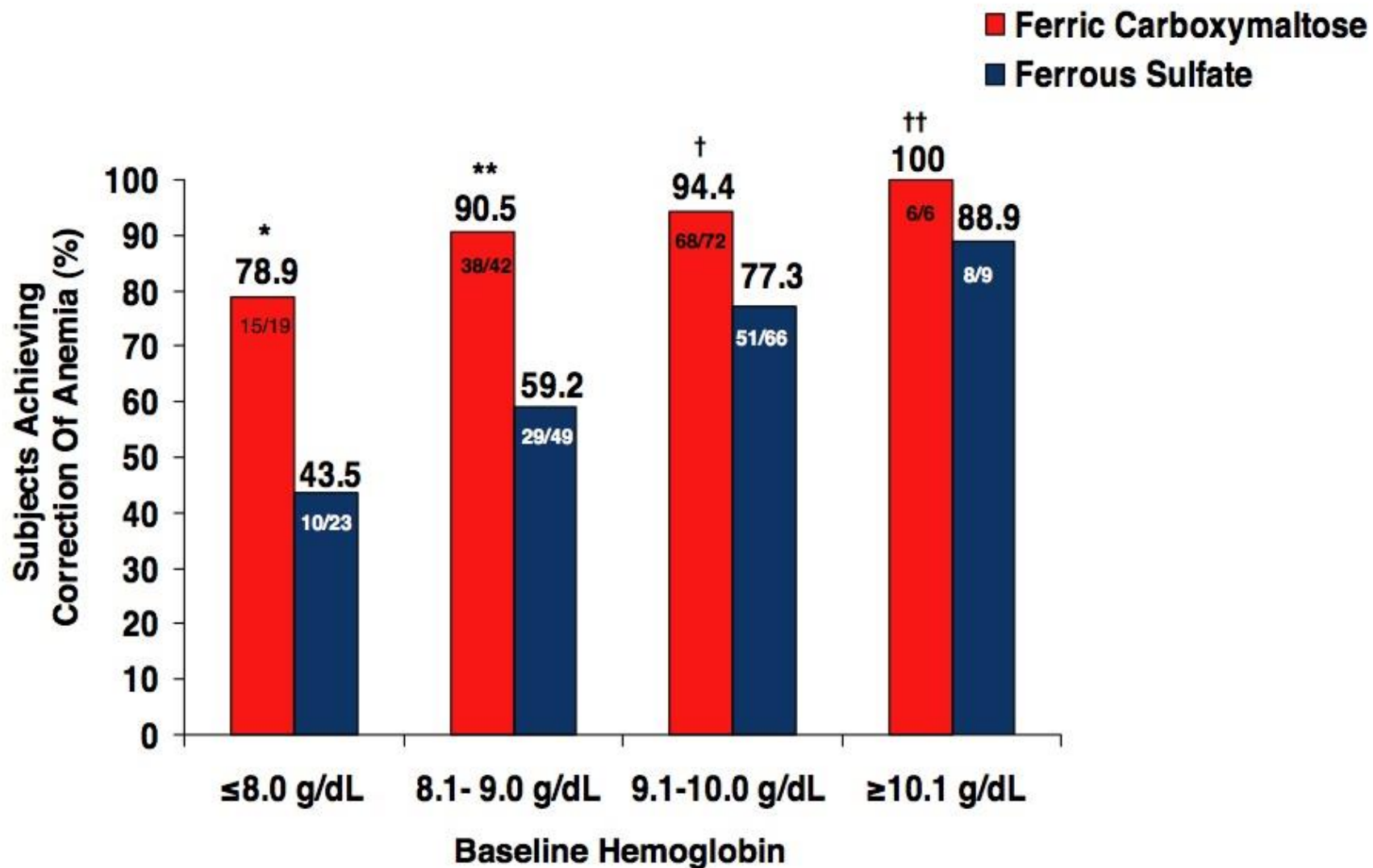
TABLE 2

Drug-related adverse events (defined as probably or possibly related to study medication) experienced by 1% or more of subjects in either treatment group: safety population

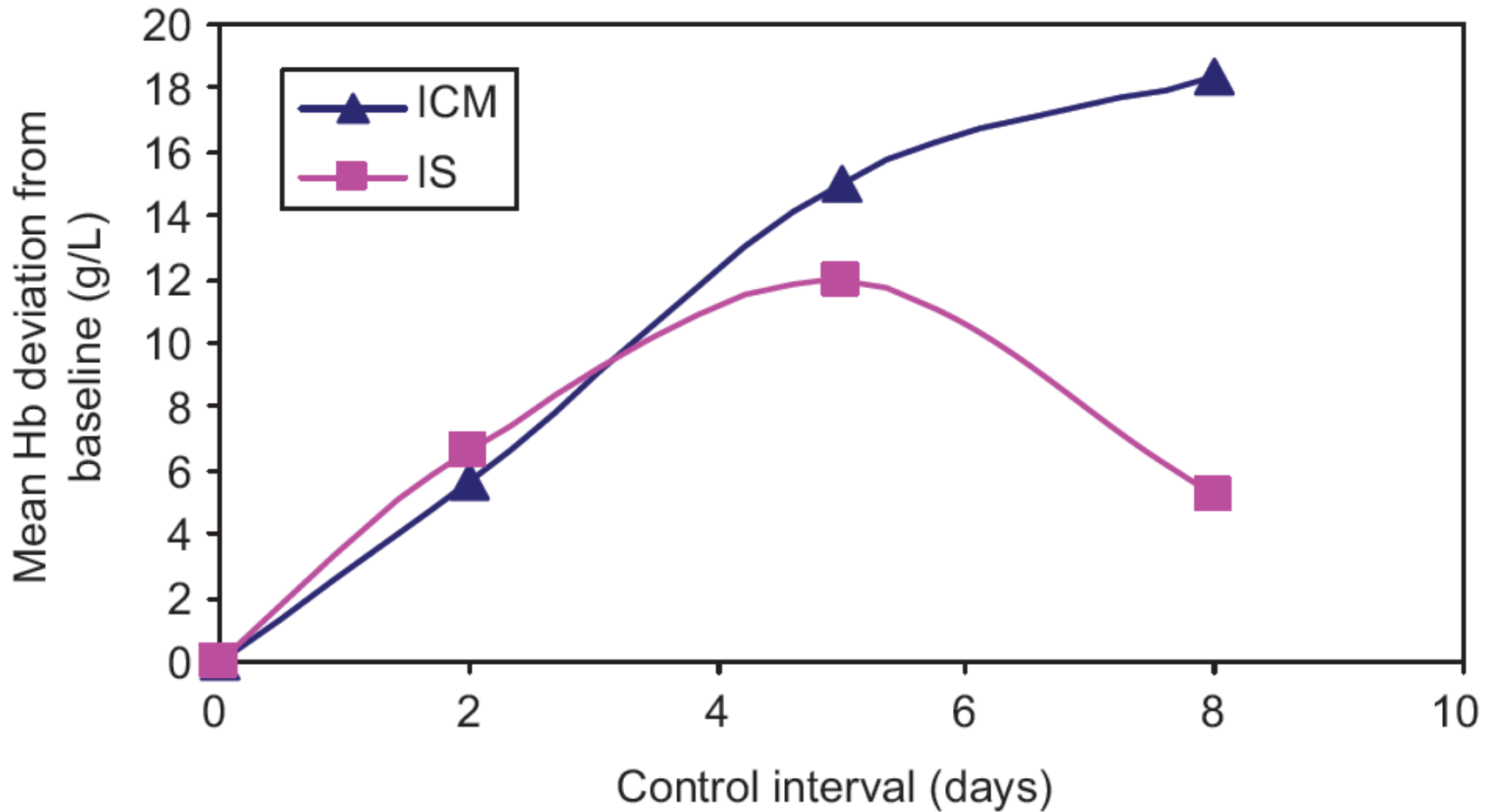
Preferred term	Ferric carboxymaltose (n = 142)	Oral ferrous sulfate (n = 147)
Patients reporting 1 or more drug-related adverse event	15 (10.6%)	32 (21.8%)
Urticaria	4 (2.8%)	1 (0.7%)
Constipation	0	16 (10.9%)
Nausea	2 (1.4%)	3 (2.0%)
Abdominal/gastrointestinal pain	1 (0.7%)	5 (3.4%)
Muscle cramp	2 (1.4%)	0
Dysgeusia	2 (1.4%)	0
Headache	2 (1.4%)	1 (0.7%)
Alanine aminotransferase increased	1 (0.7%)	6 (4.1%)
Aspartate aminotransferase increased	1 (0.7%)	3 (2.0%)

Seid. Intravenous ferric carboxymaltose for the treatment of postpartum anemia. Am J Obstet Gynecol 2008.

Taux de réponse en fonction du taux d' Hb



Anémie post-partum FCM vs IS



Correction de la CM...

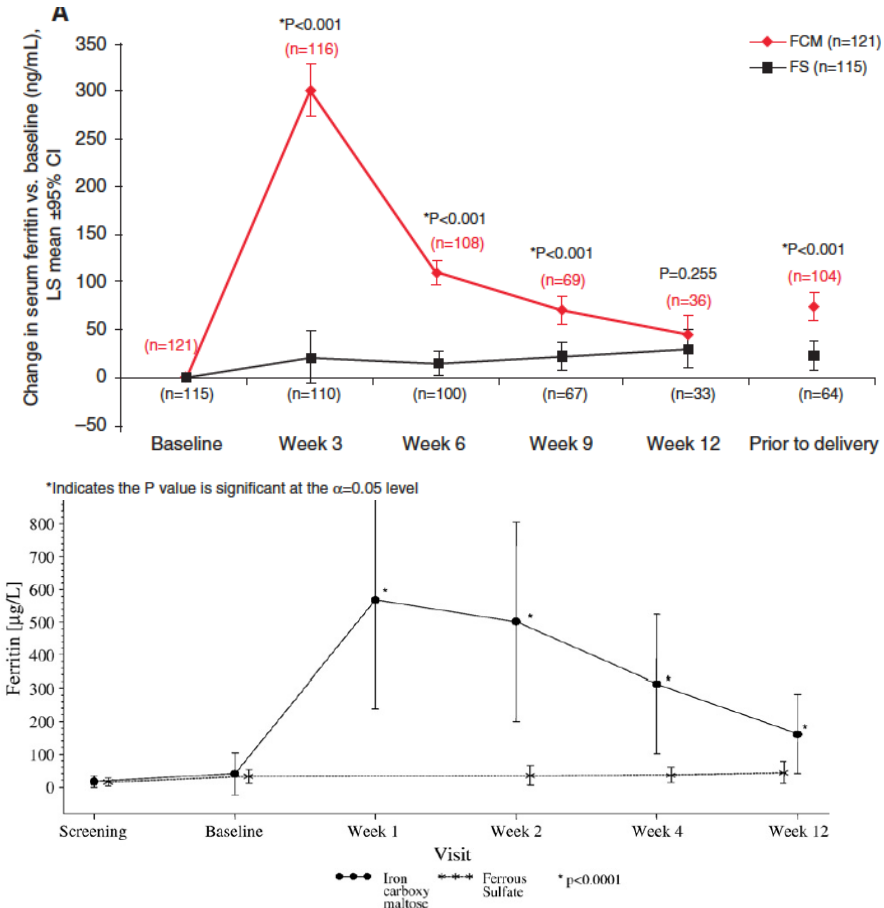
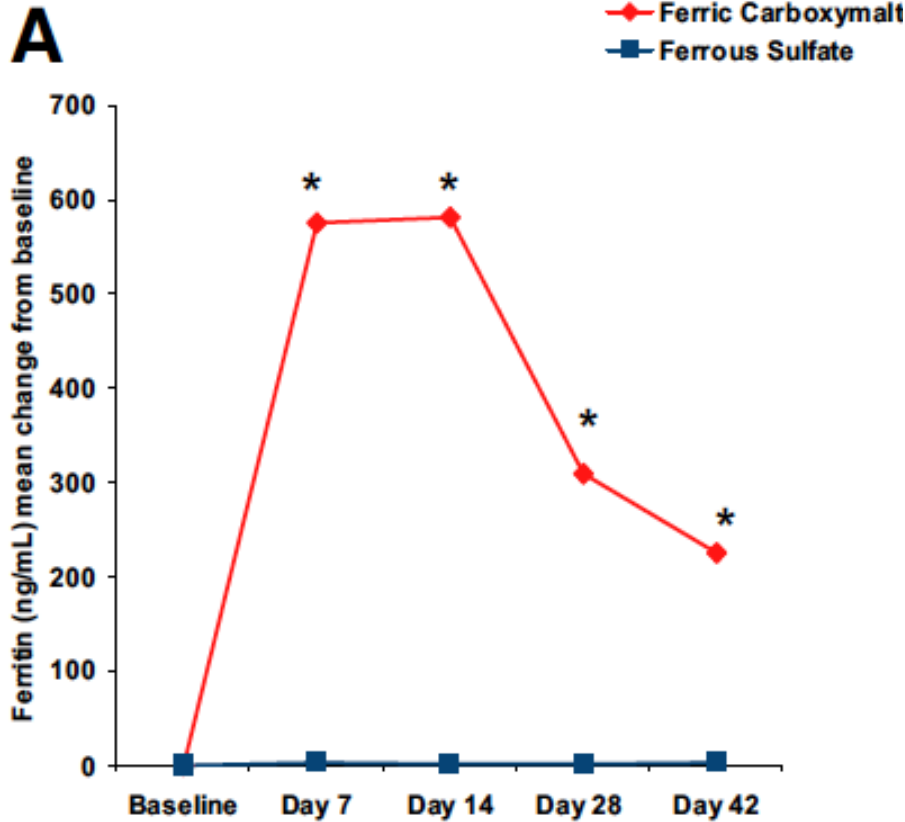
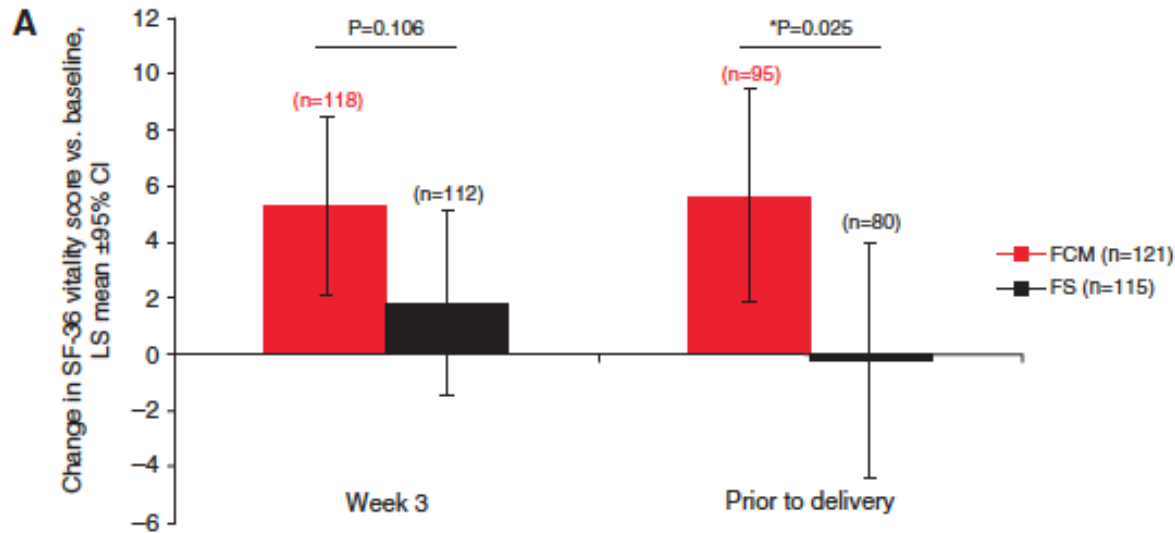


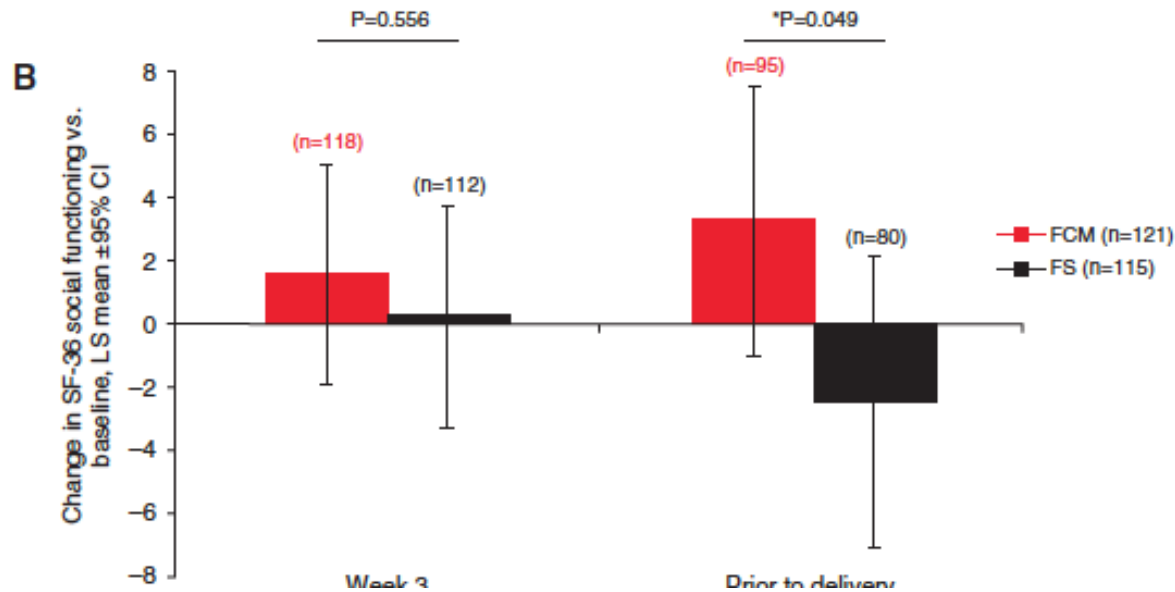
Figure 3 Mean ± standard deviation ferritin levels (µg/L) by visit—per-protocol population (n=268).

Seid *Am J Obstet Gynecol* 2008
 Breyman *Int J Gynaecol Obstet* 2007
 Breyman *J Perinat Med* 2016

**Un autre intérêt de corriger la
CM: améliorer la « fatigue »?**



*Indicates the P value is significant at the $\alpha=0.05$ level



**Amélioration
qualité de
vie Physique
et Mentale
pendant la
grossesse**

Traitement CM & QoL post-partum

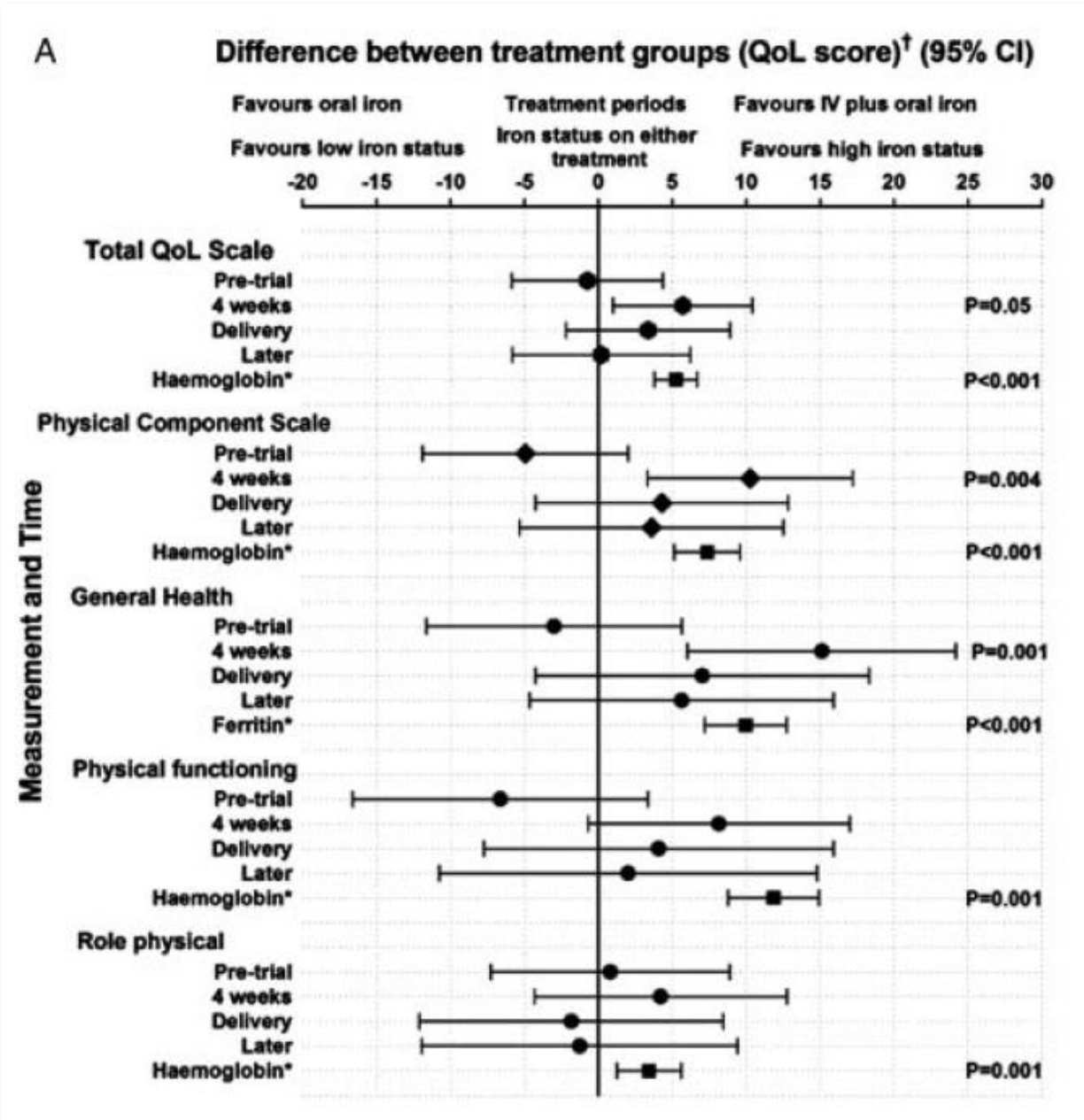
Table 1 Patient characteristics

	Intravenous iron group	Oral iron group
Number of patients	64	62
Vaginal delivery	45	46
Caesarean section	19	16
Median age (years)	28 (range; 21–43)	28.5 (range; 22–42)
Mean age (years)	27.5	28
Median time between trial intervention and delivery (months)	2.7 (range; 2.6–6)	2.8 (range; 2.2–5.3)
Median time of follow-up (months)	28	29
Baby birth weight (g)	Median 3523 (range; 1315–4920)	Median 3480 (range; 1330–4928)
Median initial Hb (g/l)	105	108
Median Hb after intervention and prior to delivery (g/l)	128	118
Median Hb postdelivery (g/l)	118 (range; 86–146)	112 (range; 78–137)
Blood transfusion requirement	None	Two patients

Hb, haemoglobin.

- Étude Randomisée contrôlée
- 2nd Trim : Fer per os (250 mg) vs IV (≈700 mg) +Per os
- Hb ≤ 11,5 g/dl et Ferr < 30 µg/l
- SF-36 quest. Avant/Sem 4/ acc^T/distance (32 mois)

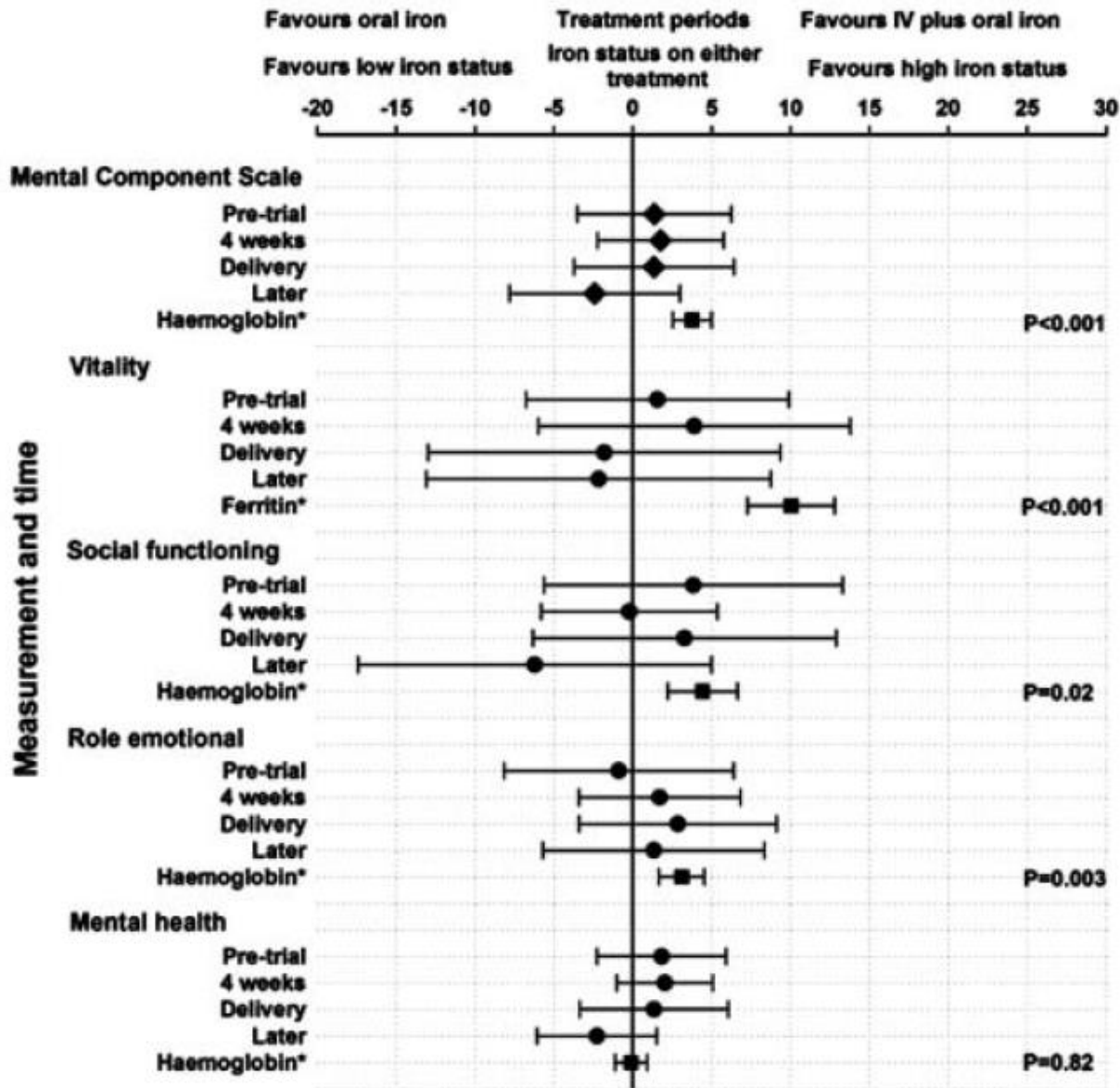
SF-36 Mental

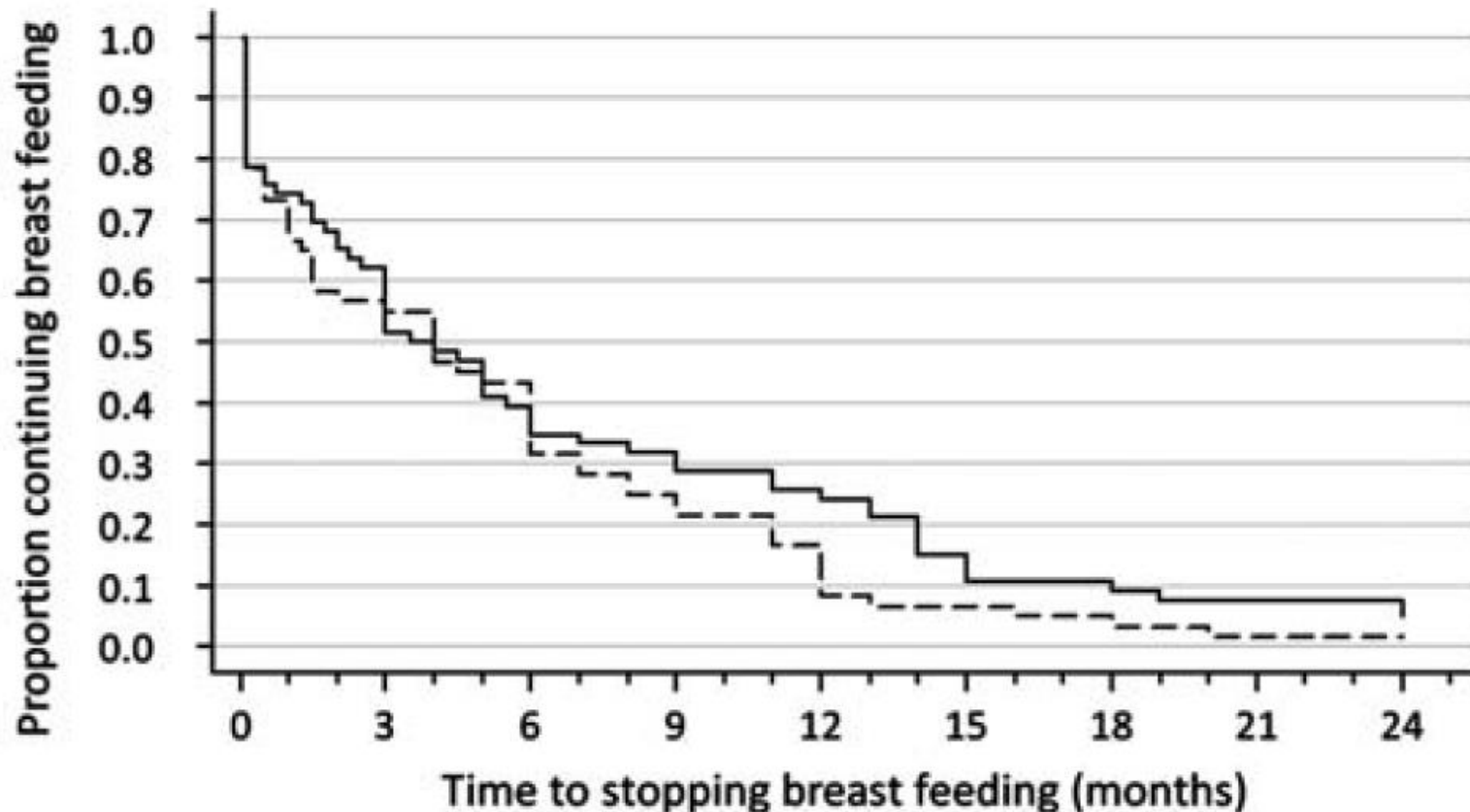


B

Difference between treatment groups (QoL score)[†] (95% CI)

SF-36 Physique





Number at risk

IV plus oral	65	41	26	21	17	10	7	4	3
Oral	61	34	26	15	10	4	3	1	1

———— IV plus oral - - - - - Oral

Risk of stopping breast feeding in IV plus oral iron group versus oral iron group:

HR 0.70 (95% CI 0.50 to 0.99; P=0.046) , adjusted for age, mode of delivery, downheartedness and alcohol consumption

Conclusions

- **Les besoins en FER pdt la grossesse sont importants : 500-1000 mg**
- **Les réserves en FER sont souvent basses**
 - *Ferritine > 50 – 70 µg/L*
 - *Intérêt de la supplémentation per os sur Hb et Poids naissance*
 - *Dose 60 mg 1 jour/2 ? Surtout si anémie ? Évaluation réponse à 2 semaines (+ si delta Hb ≥1 g/dl)*
- **Le FER IV pourrait être intéressant *per partum* si anémie sévère (2-3 trimestre)**
- **Post-partum : intérêt d'une correction rapide**
- **Bénéfice sur QoL, allaitement ... ?**

En pratique

Diagnosis of Anemia in Pregnancy
Hemoglobin ≤ 11.0 g/dL

**Si fatigue
Obj Ferr ≥ 100**

Diagnosis of IDA in Pregnancy
Ferritin < 30 ug/dL

Ferritin ≥ 30 ug/dL

Suspect cause other than isolated iron deficiency

First trimester

Second trimester

Third trimester

1j/2 ?

Oral iron 325mg BID for 2 wks

Hb ≥ 10.5 g/dL

Hb < 10.5 g/dL

Intravenous Iron

Hb rise ≥ 1 g/dL

Hb rise < 1 g/dL

Oral iron **

gestation ≤ 13 wks

gestation > 13 wks

Check counts 6 wks post partum

Depending on Hb, give IV iron in 2nd trimester or give PRBC transfusion now

Intravenous Iron

Check counts 6 wks post partum

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Merci

				Preparations		
Generic name	Iron sucrose	Sodium ferric gluconate	LMW iron dextran	Ferumoxytol	FCM	Iron isomaltoside
Trade (brand) name	Venofer	Ferlecit	INFeD, CosmoFer	Feraheme	Ferinject, Injectafer,	Monofer (Europe only)
Manufacturer	American Regent Inc	Sanofi Aventis Inc	Watson Pharma	AMAG Pharmaceuticals	Luitpold Pharmaceuticals	Pharmacosmos
Carbohydrate	Sucrose	Gluconate	LMW iron dextran	Polyglucose sorbitol carboxymethylether	Carboxymaltose	Isomaltoside
Concentration of elemental iron	20 mg/mL	12.5 mg/mL	50 mg/mL	30 mg/mL	50 mg/mL	100 mg/mL
TDI	No	No	Yes	No	Yes	Yes
Test dose required	No	No	Yes	No	No	No
Recommended max dose	Multiple doses of 200-300 mg	Multiple doses of 125-187.5 mg	Multiple doses of 100 mg or single infusion of 1000 mg	2 infusions of 510 mg given 3-8 d apart or a single dose of 1020 mg	2 doses of 750 mg, given 7 or more days apart (weight <50 kg) 2 doses of 15 mg/kg (or 1000 mg) given 7 or more days apart if weight >50 kg	A single infusion, at a dose of 20 mg/kg (or 1000 mg) or up to 3 doses of 500 mg given over 7 d
Infusion time	Over a period of at least 15 min	1 h	1 h	15 min	15 min	15 min
Pregnancy category	B	B	C	C	C	Not listed