ORLEANS 6/4/2018

19ème journée de perfectionnement
sur la prise en charge des couples infertiles

Lancet. 2002 Sep 7;360(9335):742.

Sperm mRNA--what does daddy do?

Schatten GP[1].

Basic and Clinical Andrology

REVIEW ARTICLE Open Access

Paternal obesity: how bad is it for sperm quality and progeny health?

Focused Review

The most common vices of men can damage fertility and the health of the next generation

Obesity, male infertility, and the sperm epigenome

Format: Abstract

Curr Epidemiol Rep. 2017 Mar;4(1):46-55. doi: 10.1007/s40471-017-0086-8. Epub 2017 Jan 11.

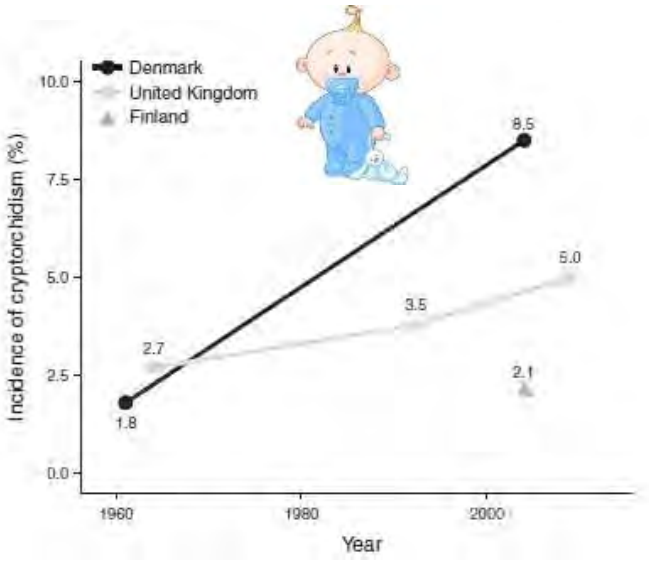
Fathers Matter: Why It's Time to Consider the Impact of Paternal Environmental Exposures on Children's Health.

Braun JM[1], Messerlian C[2], Hauser R[2,3]

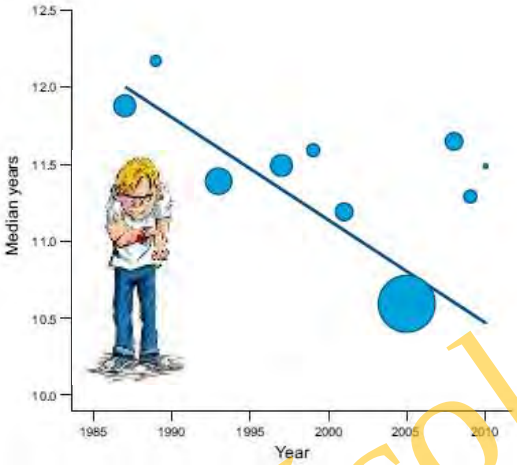
Nutrition et infertilité, la part de l'homme

Pr Rachel LEVY
Centre d'Assistance Médicale à la Procréation – CECOS
Hôpital Tenon, 4 Rue de la Chine
75020 Paris, HUEP, APHP
rachel.levy@aphp.fr

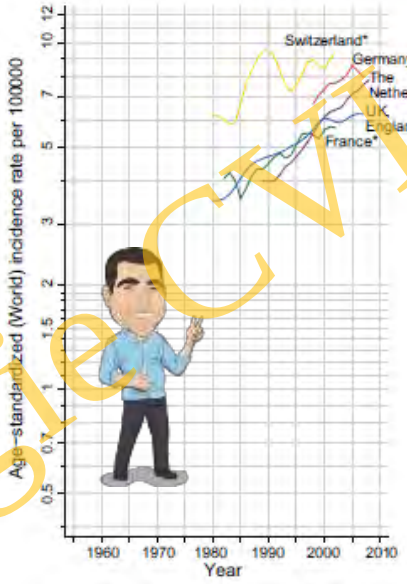
EPIDEMIOLOGIE



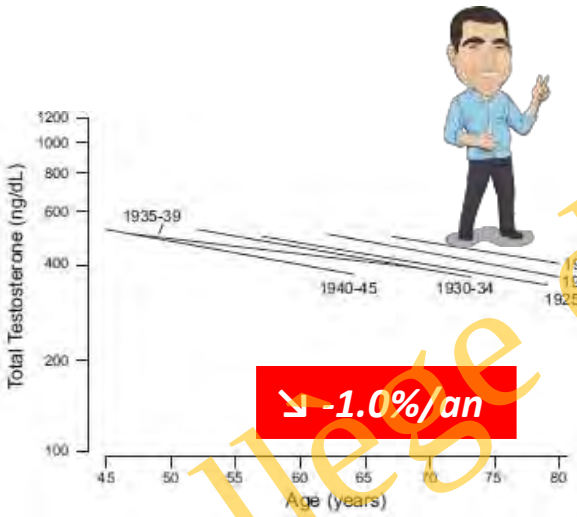
↑*Incidence des anomalies de migration testiculaire*



Une puberté plus précoce

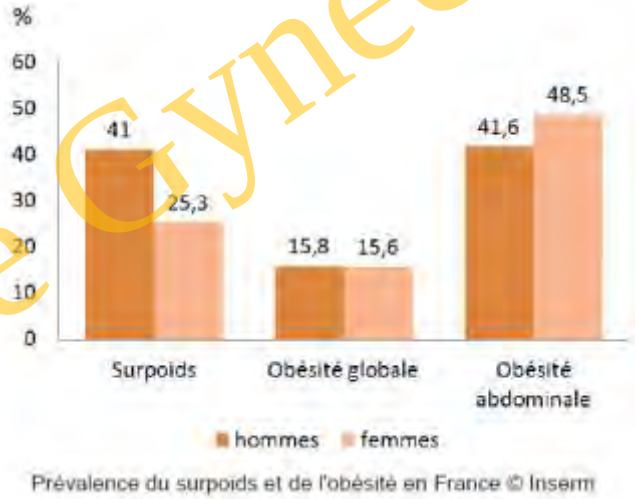


↑*Cancers testiculaires*



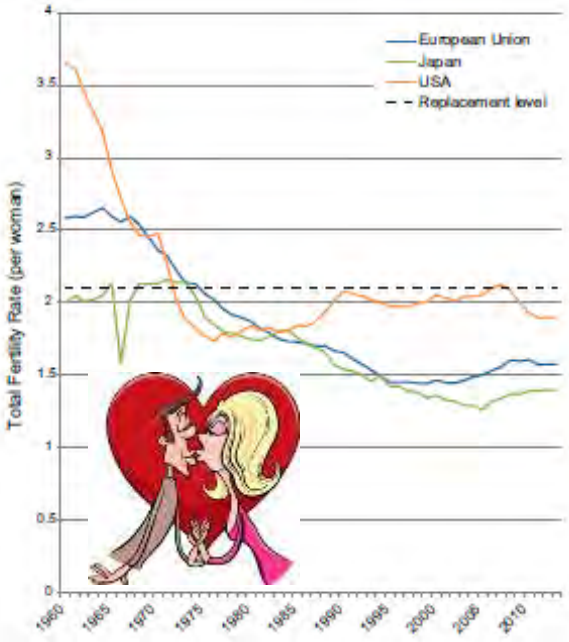
↘ *-1.0%/an*

↘ *séculaire de testostéronémie*



Prévalence du surpoids et de l'obésité en France © Inserm

Près d'un Français sur deux > 30 ans en excès de poids + obésité abdominale (prévalence de l'obésité 8,5% en 1997)

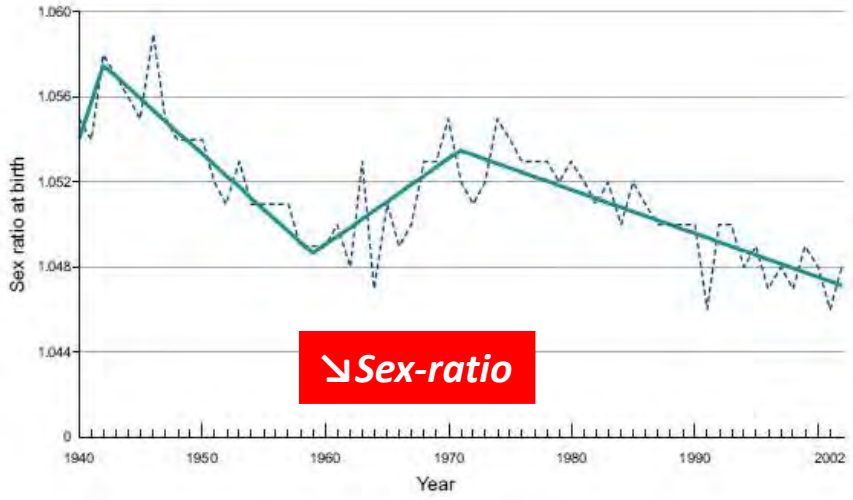


↘*Taux de fertilité < 2.1*

Skakkebaek et al., Physiol Rev 2016

Cohorte Constances, BEH 25 oct 2016

SANTE REPRODUCTIVE



↘Sex-ratio

De moins en moins de garçons….

FIGURE 12. Sex ratio at birth and join-point segments, 1940–2002, all mothers. [From Mathews and Hamilton (264).]

↘numération spermatique de 60% de 1973 à 2011

Levine et al., HRU juillet 2017

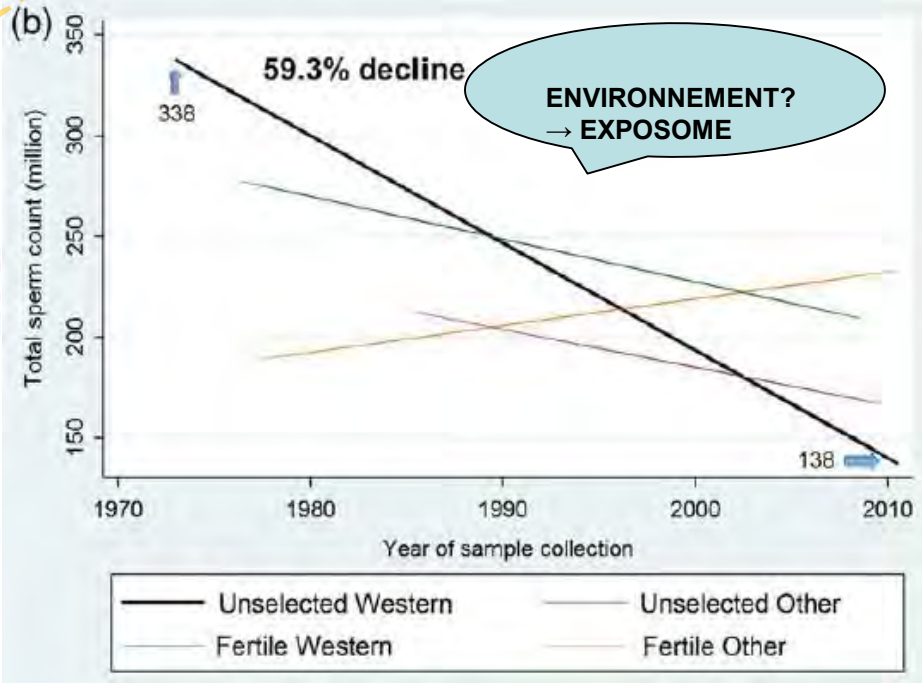
↘ -1.5%/an USA ; -3% Europe et Australie

Carlsen et al., 1992 ; Swan et al., 2000

Le Point Santé

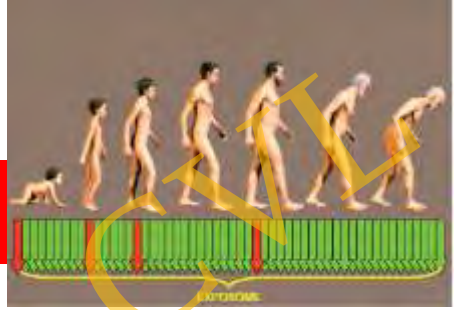
Fertilité : chute importante du nombre moyen de spermatozoïdes en Occident

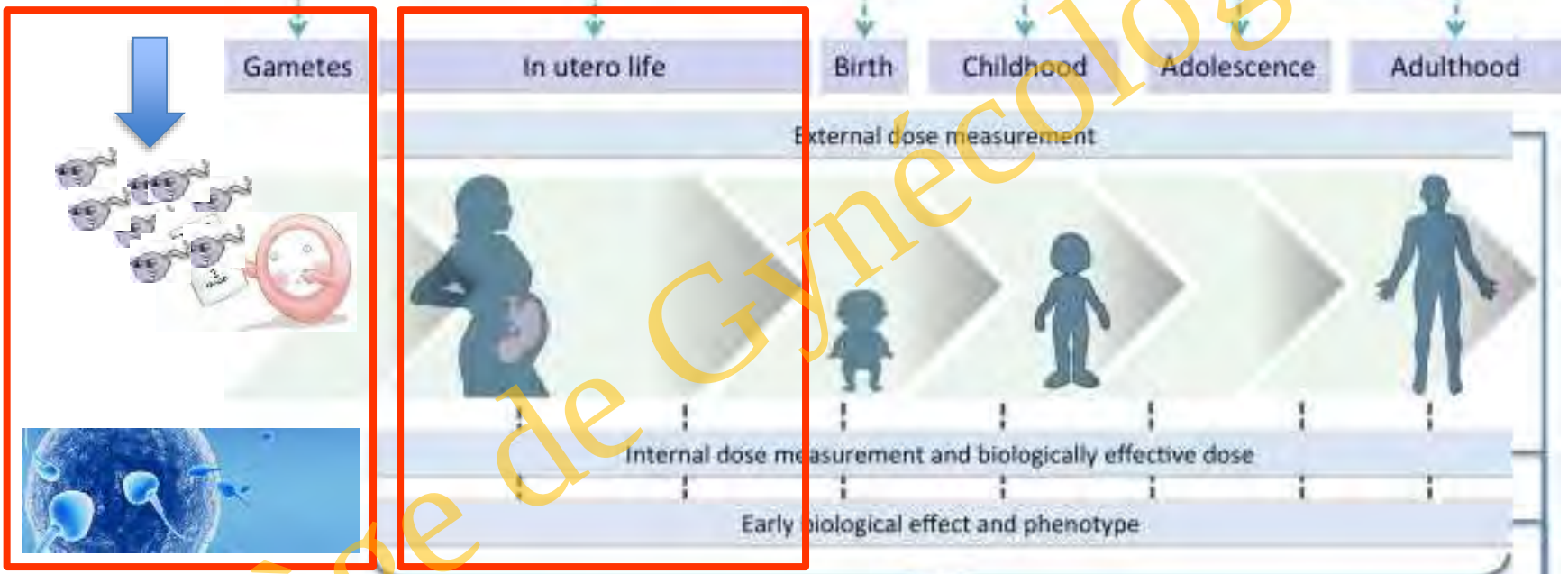
Selon une étude publiée mardi, la concentration de spermatozoïdes chez les hommes dans les pays occidentaux a été divisée par deux en près d'un demi-siècle.



EXPOSOME : DEFINITION

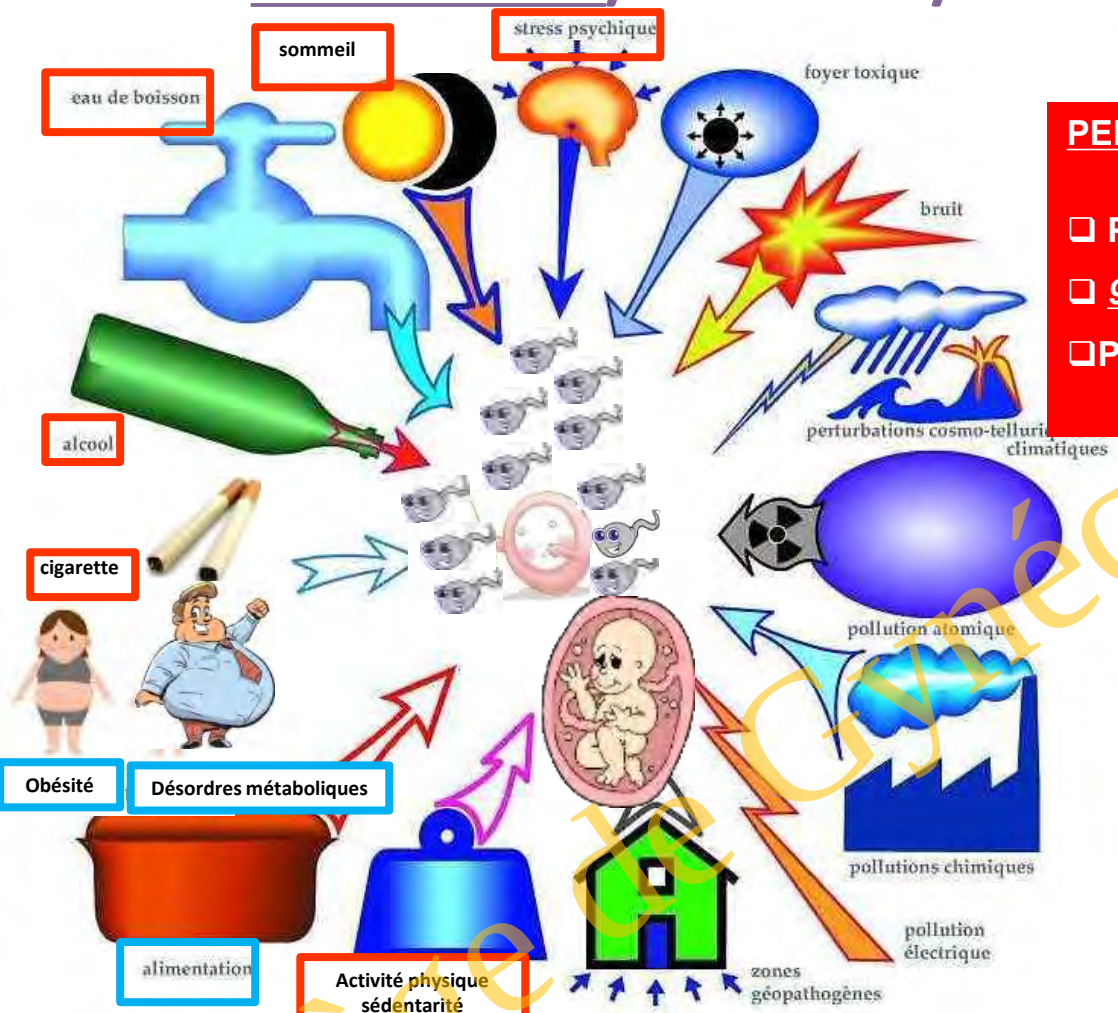
Ce à quoi est exposé un individu depuis sa naissance jusqu'à sa mort
Dr Chris Wild, CIRC





Siroux et al., 2016

EXPOSOME/FERTILITE/SANTE DE L'ENFANT



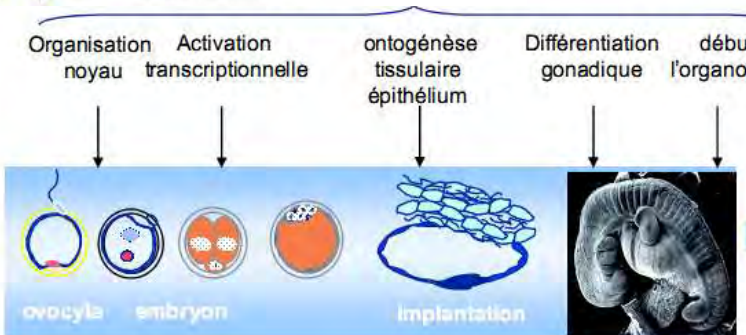
PERIODES CRITIQUES D'EXPOSITION :

- ❑ PERICONCEPTION
- ❑ *9 MOIS IN UTERO → 2 PREMIERES ANNEES*
- ❑ PERIPUBERTE

1000 JOURS &PLUS
Le meilleur départ pour la vie

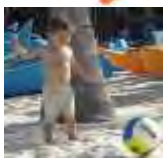
QUEL EFFET ?

- ❑ EVALUER ?
- ❑ INTERVENIR ?
- ❑ TRANSGENERATIONNEL ?



Périodes critiques du développement

Naissance



NUTRITION / DEUX PERIODES D'EXPOSITION

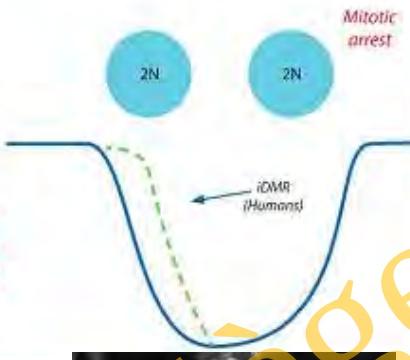
le fils exposé
IN UTERO

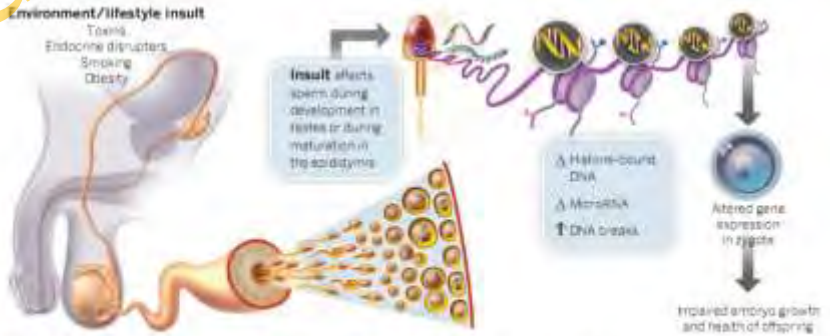
le futur père exposé
PERI-CONCEPTION

Curr Envir Health Rpt

Avant la naissance | Péri -puberté | Spermatogénèse | Fécondation | Implantation

Mouse *(days)*	E7.5		E12.5		4-6 weeks	35 days				E3.5	E7.5
Human *(weeks)*	G4	G7	G11	G16	12-14 years	74 days				G1	
	Primordial Germ Cell Development					**Spermatocytogenesis**			**Spermiogenesis**		**Early Life Development**
	PGC Specification		Prospermatogonia			Spermatogonia		Spermatocyte	Spermatid	Spermatozoon	Epididymal Maturation	Fertilized Egg	Morula	Blastocyst	Gastrulation
						Type A	*Type B*	*Primary* *Secondary*	*Round*	*Elongated*					
								Meiosis I	*Meiosis II*						





2. Prepubertal Clonal Expansion

iDMRs

Dimorphisme sexuel

Fig. 3. Environmental effects on paternal nongenetic contributions. Postulated modes of action of environment or lifestyle factors on sperm function, imparted either during spermatogenesis or epididymal transit, and pathways for impact on the development of the embryo.

DOHaD*

Environnement précoce inadéquat

Anomalie placentaire

Phénotype : "ECONOME"

Croissance fœtale réduite (RCIU)

Programmation fœtale et embryonnaire

ACTE I — *Marques épigénétiques*

Réponse adaptative prédictive

Structure et/ou fonction altérée / croissance réduite
cellules ß, muscle, adipocytes, cardiomyocytes, rein, foie..

Match/Mismatch

ACTE II — *Marques épigénétiques*

Cancer | Obésité | HTA | IR/Diabète Type 2 | MCV | Fertilité

Maladie chronique adulte

Santé métabolique et reproductive

*Origines développementales de la santé et des maladies de l'adulte

D'après Pascale Chavatte-Palmer, Hypothèse de Barker

REGIME MATERNEL HYPERGRAS DEBUTE AVANT PUBERTE

Cordier et al. 2013 PloS One; Léveillé et al. 2014 J DOHAD; Dupont et al. 2014 J DOHAD

Puberté — Reproduction — Naissance — Sevrage

10 s — 12 s — 18 s — Gestation — 22 s — Lactation — 26 s

HH : Régime High fat diet (HH) = 6% d'huile de soja - 0.2% de cholesterol

C : Régime contrôle

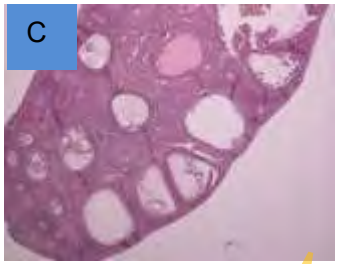
♀

Puberté
↓Nombre de follicules antraux
↑Perte folliculaire

Croissance fœtale réduite
RCIU

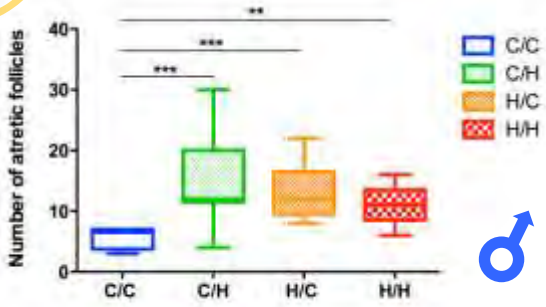
le fils exposé *IN UTERO*

Mère (F0)



♀

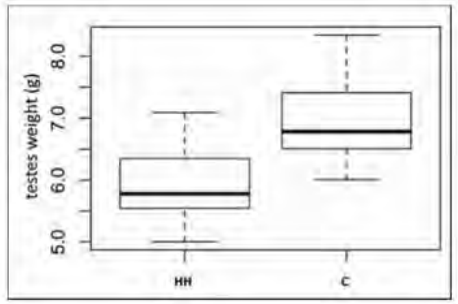
Fille (F1)



♂

↑ Perte folliculaire

Fils (F1)



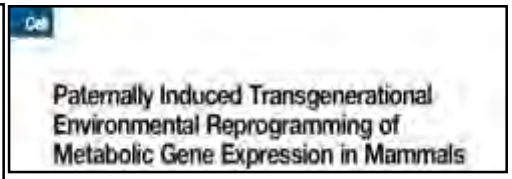
↘Poids testicule et épididyme
↘Testostéronémie

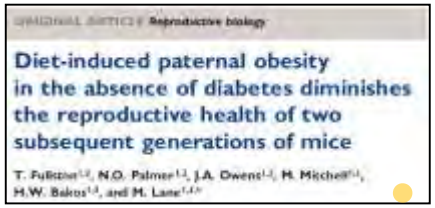
Le régime hypergras maternel a un effet sur le poids de naissance des fils + sur le poids des organes reproducteurs et la testostéronémie

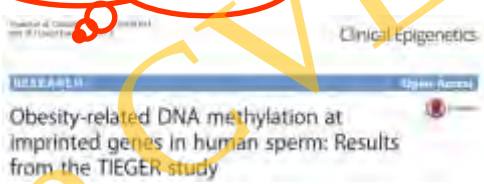
DOHaD : ROLE DU PÈRE !

le père exposé
PERI CONCEPTION


LETTER
Chronic high-fat diet in fathers programs β-cell dysfunction in female rat offspring


Cell
Paternally Induced Transgenerational Environmental Reprogramming of Metabolic Gene Expression in Mammals


Diet-induced paternal obesity in the absence of diabetes diminishes the reproductive health of two subsequent generations of mice


Clinical Epigenetics
Obesity-related DNA methylation at imprinted genes in human sperm: Results from the TIEGER study

Régime hyperlipidique → ♀ adultes obèses diabétiques

Régime pauvre en protéines → Métabolisme lipidique des enfants

Père : obésité induite → ♂ / ♀ F1/F2 Reproduction et métabolisme

Père obèse (H) → Epigénome modifié spz et sang du cordon ♂ Hypométhylation IgF2


Obésité


1/ Méthylation globale ADN

Modifications épigénétiques

3/ Petits ARN non codants

Radiations

Alimentation


Cocaïne

Cigarette

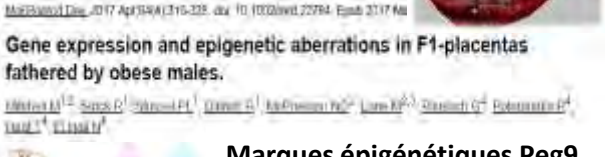

Alcool


Activité physique

Fertilization

2/ Modifications des histones

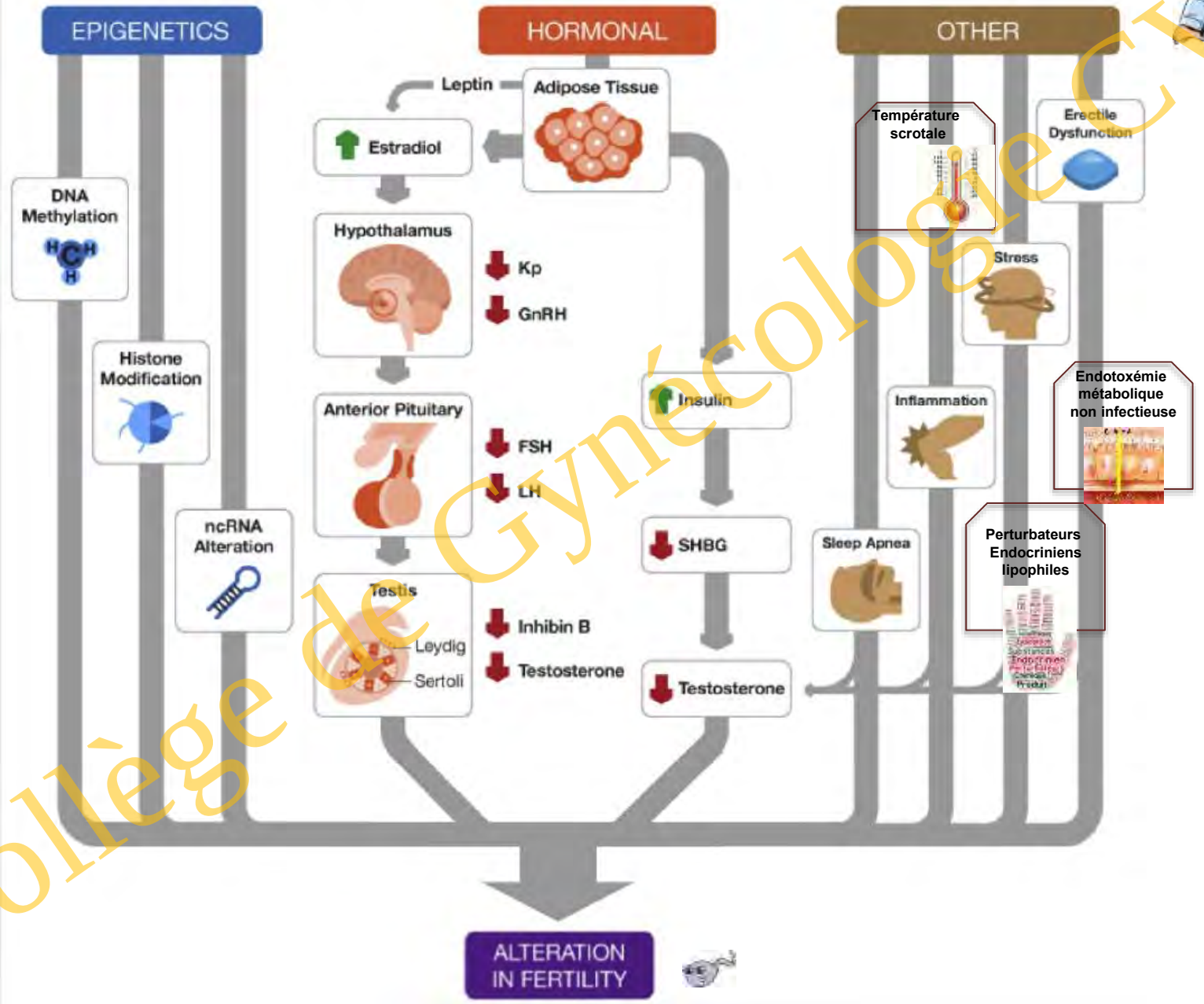
Transmission transgénérationnelle des marques épigénétiques


Gene expression and epigenetic aberrations in F1-placentas fathered by obese males.

Marques épigénétiques Peg9 spz/placenta des petits

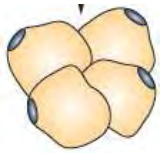
Anomalies qualitatives et quantitatives des spermatozoïdes

OBESITE/ FERTILITE / MECANISMES COMPLEXES



OBESITE/ INFERTILITE MASCULINE

Hypothalamus /Hypophyse | Tissu adipeux | Foie | Testicule | Maturation épididyme



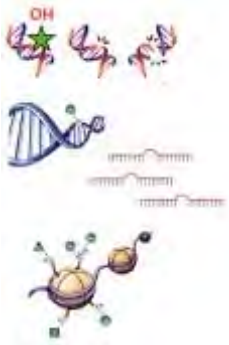
Hypogonadisme hypogonadotrope
E2, Leptine↑≠T, SHBG↓

Insulinorésistance
Insuline↑, SHBG↓

Inflammation chronique
→TNF, ILs et macrophages ↑

Déséquilibre balance pro/anti oxydant
→ERO↗ / Capacité antioxydante ↓

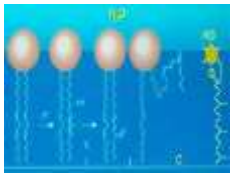
Plasma séminal et spermatozoïdes (quant/qual)



Chromatine ADN
Génome/épigénome

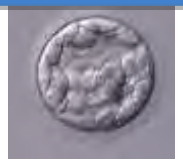
Mitochondries
PMM

Lipides membranaires
RA



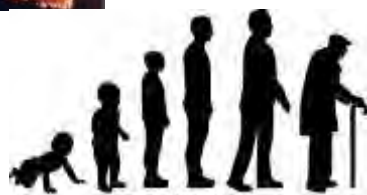
Fécondation

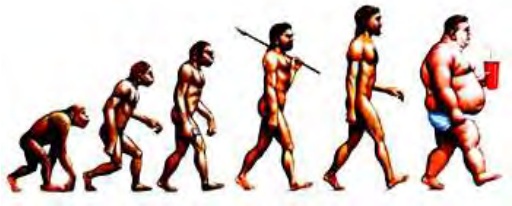
Développement embryonnaire



Implantation

Grossesse et développement fœtal





IMC ♂ / FERTILITE / AMP

❑ **Impact NEG de l'obésité de l'homme sur la fertilité (hors AMP), OR : 1,66, 95% CI (1,53-1,79)**
→Relation dose-réponse, max IMC 32-43 kg/m2 puis plateau

❑ **AMP : 35% de naissance vivante e' ins OR : 0,65, 95% CI (0,44-0,9)**

❑ **AMP : 3 fois plus de grossesse. 97 95% CI (1,34-6,13)**
mpbell, 2015 RBM online; ASRM 2015

CONTROVERSE

The influence of female and male body mass index on live births after assisted reproductive technology treatment: a nationwide register-based cohort study

Gitte Lindved Petersen, M.Sc. (Public Health),[a] Lone Schmidt, D.M.Sci.,[a] Anja Pinborg, D.M.Sci.,[b] and Mads Kamper-Jørgensen, Ph.D.[a]

[a] Section of Social Medicine, Department of Public Health, and [b] Fertility Clinic, Juliane Marie Center, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark

Preg... live birth outcomes according to paternal BMI.

Outcome	Normal (n = 63)	Overweight (n = 148)	Obese (n = 62)	Morbidly obese (n = 32)
Live birth/OPU (%)	41.3[a]	26.4[b]	22.6[b]	12.12[c]

Impact négatif d'un IMC élevé de la femme ET de l'homme sur les taux de naissance AMP, de façon combinée et de façon indépendante …!

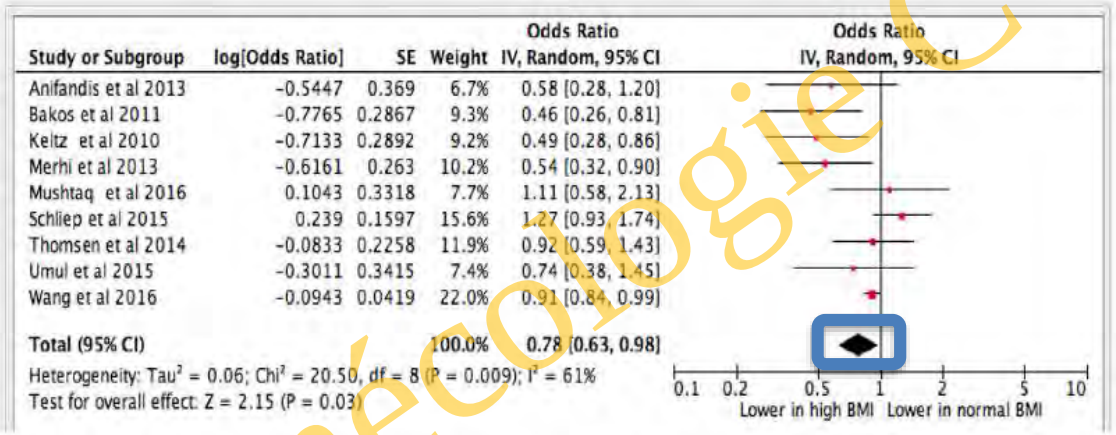
RBM ONLINE

Review

Effect of male body mass index on assisted reproduction treatment outcome: an updated systematic review and meta-analysis

Rabia Mushtaq [a,*], Jyotsna Pundir [a], Chiara Achilli [a], Osama Naji [a], Yacoub Khalaf [a], Tarek El-Toukhy [a]

[a] Assisted Conception Unit, Guy's and St Thomas Hospitals NHS Foundation Trust, 11th Floor Tower Wing, London, UK



2 – Meta-analysis of the effect of high male body mass index on clinical pregnancy rate in assisted reproduction techniques.

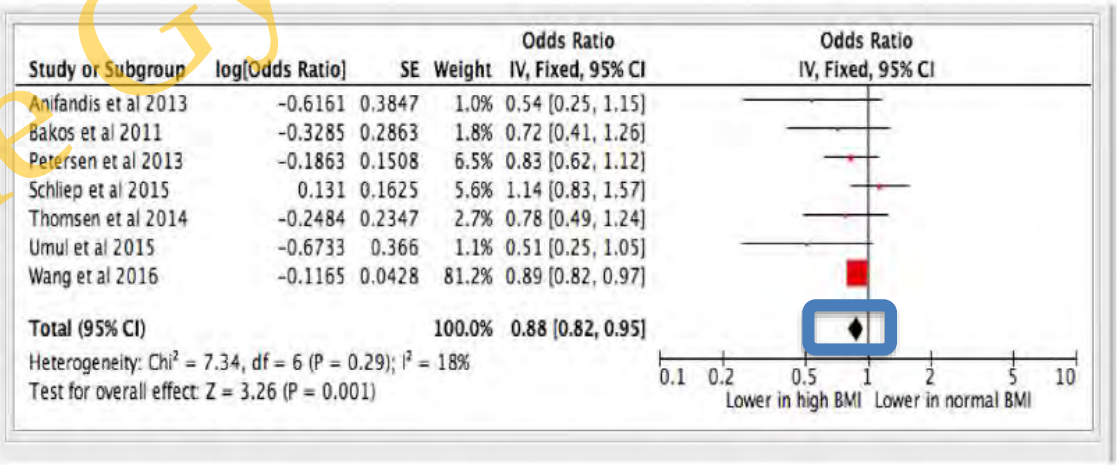
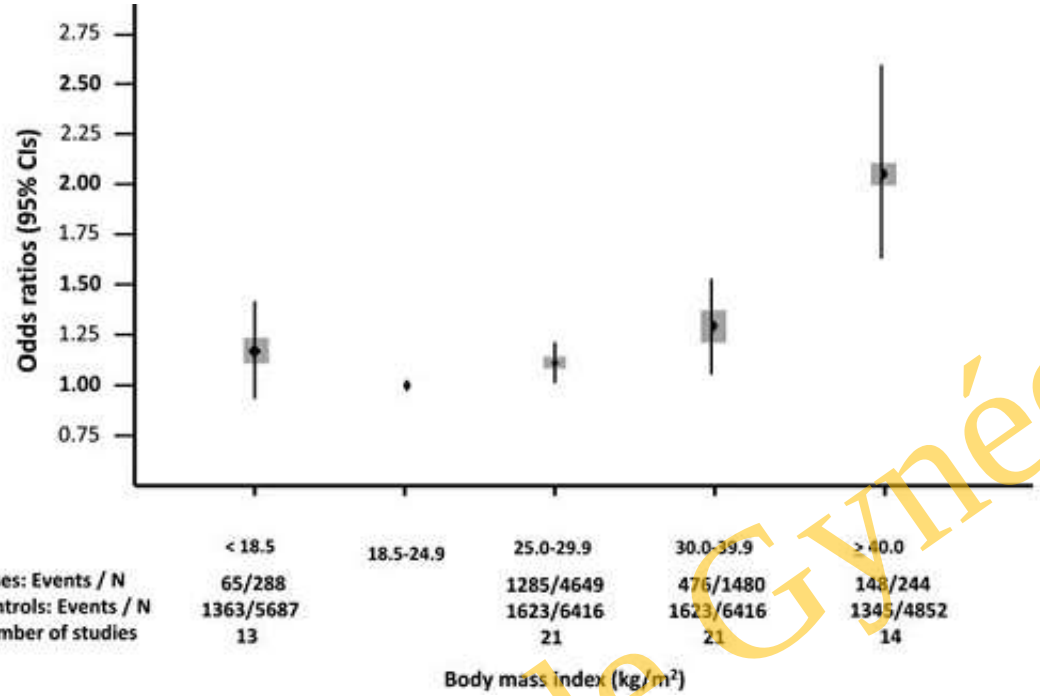
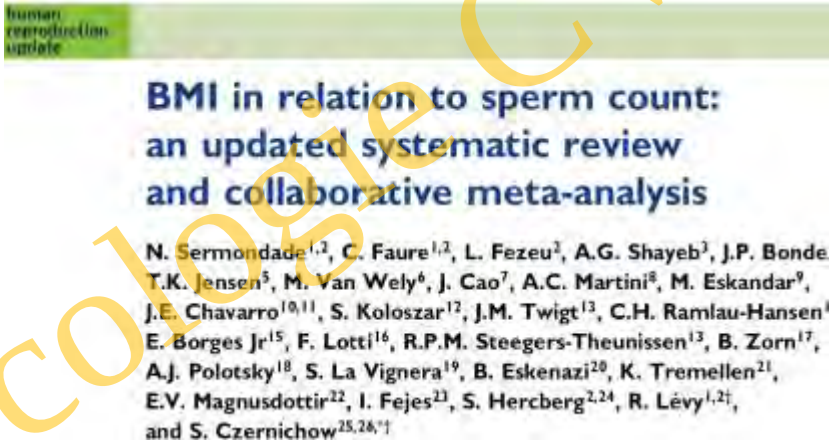


Figure 3 – Meta-analysis of the effect of high male body mass index on live birth rate in assisted reproduction techniques.

IMC ♂/ NOMBRE TOTAL DE SPERMATOZOÏDES





BMI in relation to sperm count: an updated systematic review and collaborative meta-analysis

N. Sermondade[1,2], C. Faure[1,2], L. Fezeu[2], A.G. Shayeb[3], J.P. Bonde[4], T.K. Jensen[5], M. Van Wely[6], J. Cao[7], A.C. Martini[8], M. Eskandar[9], J.E. Chavarro[10,11], S. Koloszar[12], J.M. Twigt[13], C.H. Ramlau-Hansen[14], E. Borges Jr[15], F. Lotti[16], R.P.M. Steegers-Theunissen[13], B. Zorn[17], A.J. Polotsky[18], S. La Vignera[19], B. Eskenazi[20], K. Tremellen[21], E.V. Magnusdottir[22], I. Fejes[23], S. Hercberg[2,24], R. Lévy[1,2†], and S. Czernichow[25,26,*†]

Sermondade et al., *Human Reproduction Update*, 2012 ; *Archives Interne Med. JAMA* 2012 ; Belloc *et al.*, *FS* 2014; Oliveira *et al. Andrologia* 2017

L'obésité (et la maigreur)↗ le risque de présenter un NTS↓, y compris azoospermie

- 1.28 (1.06-1.55) obésité ; -2.04 (1.59-2.62) pour obésité morbide -

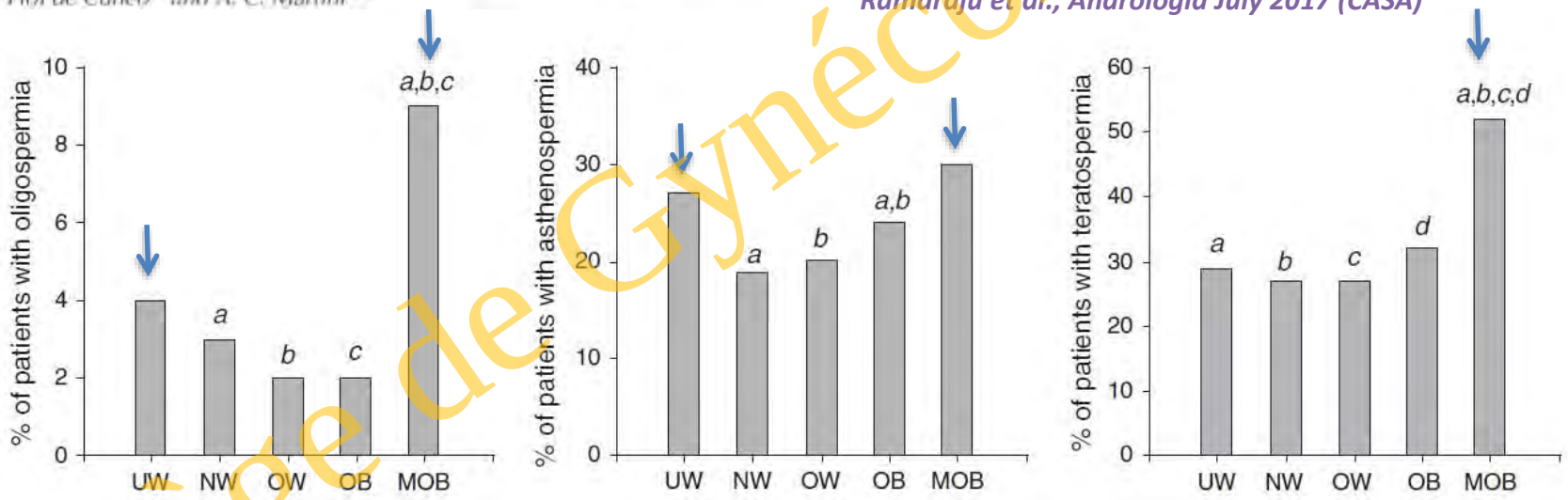
IMC ♂/ PARAMETRES SPERMATIQUES

CSIRO PUBLISHING
Reproduction, Fertility and Development
http://dx.doi.org/10.1071/RD15351

Body mass index and human sperm quality: neither one extreme nor the other

E. M. Luque[A], A. Tissera[B], M. P. Gaggino[B], R. I. Molina[B], A. Mangeaud[C], L. M. Vincenti[A], F. Beltramone[D], J. Sad Larcher[D], D. Estofán[D], M. Fiol de Cuneo[A] and A. C. Martini[A,E]

Luque et al., Reproduction, Fertility and Development Dec 2015
Oliveira et al, Andrologia, Aug 2017
Ramaraju et al., Andrologia July 2017 (CASA)

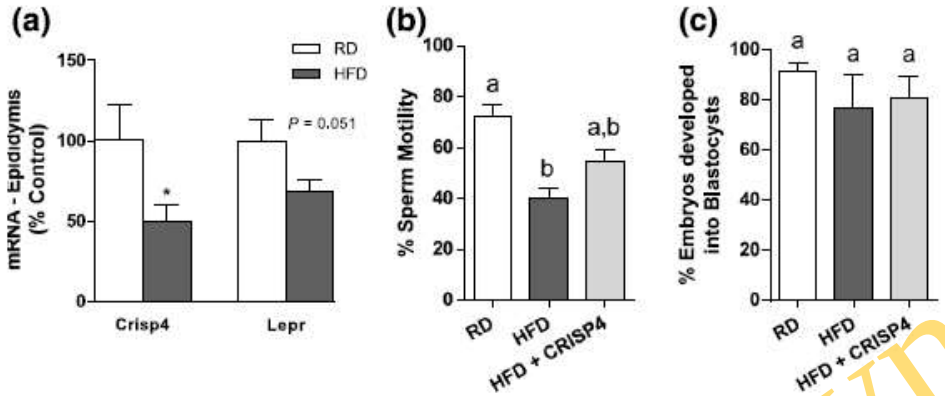


L'obésité morbide (et la maigreur)↗ le risque de présenter un NTS ↓,
↓ mobilité (CASA), ↓ formes normales, perturbe le fonctionnement des mitochondries
maturation épididymaire altérée

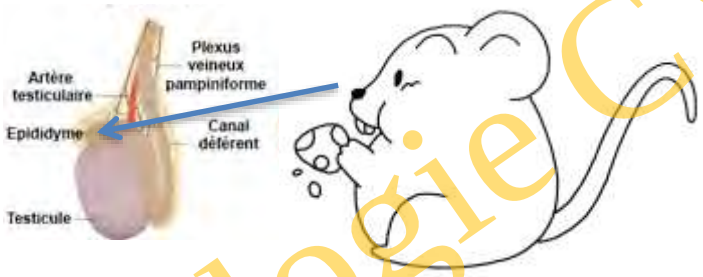
IMC ♂ / REACTION ACROSOMIQUE

Obesity-Induced Infertility in Male Mice Is Associated With Disruption of *Crisp4* Expression and Sperm Fertilization Capacity

Beatriz C. Borges,[1] David Garcia-Galiano,[1] Sanseray da Silveira Cruz-Machado,[1,2] Xingfa Han,[1,3] Galina B. Gavrilina,[4] Thomas L. Saunders,[4,5] Richard J. Auchus,[5,6] Saher S. Hammoud,[7] Gary D. Smith,[1,8,9] and Carol F. Elias[1,8]

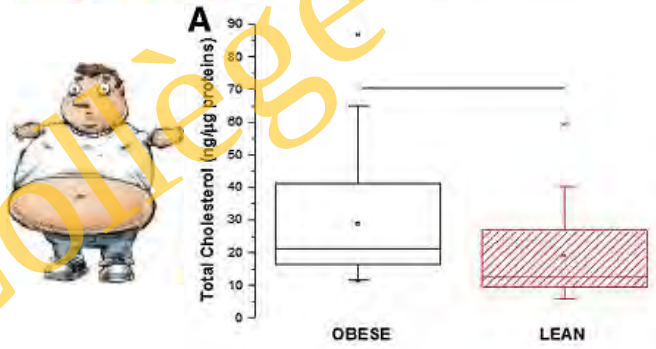


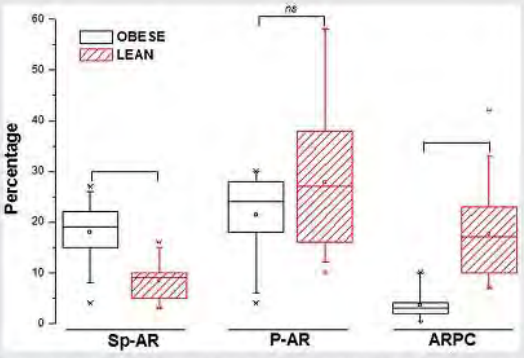
Endocrinology, September 2017, 158(9):2930–2943



Souris HFD ou génétiquement obèses
↓Expression sécrétion Crisp4 testicule et épididyme
↓mobilité ↓ fécondance ↓développement embryon
Restauré par trt *in vitro* Crisp4 spz avant FIV

Acrosome reaction is impaired in spermatozoa of obese men: a preliminary study





Spermatozoa of obese men display higher levels of Sp-AR and reduced ARPC. Acrosome reaction was evaluated with the fluorescent probe lectin in swim-up selected and capacitated spermatozoa of obese (n = 13) and lean (n = 19) patients in basal conditions (Sp-AR) or after stimulation with P (P-AR). The Sp-AR, P-AR, and ARPC data are reported as box charts, indicating statistical significance (*P*) as evaluated by Student's *t* test for unpaired samples. P<.0001

Samavat. Acrosome reaction in sperm of obese men. Fertil Steril 2014.

IMC ♂/ ADN SPERMATIQUE

Dupont et al., *Aja* 2013

	BMI			Univariate		After adjustment for age and tobacco use	
	Normal (<25.0 kg.m^{-2}) (n=151)	Overweight (25.0-29.9 kg.m^{-2}) (n=137)	Obese (≥30.0 kg.m^{-2}) (n=43)	Overweight vs normal	Obese vs normal	Overweight vs normal	Obese vs normal
				p-value			
Total sperm count (TSC) (10^6)	108.7 ± 162.0	104.0 ± 142.1	110.5 ± 180.8	NS	NS	NS	NS
Mobility (%)	42.5 ± 16.4	38.7 ± 15.6	[illegible]	NS	**0.012**	NS	**0.005**
Morphology (%)	21.4 ± 12.7	18.1 ± 12.0		NS	NS	NS	NS
DNA fragmentation rate (%)	14.4 ± 9.5	15.4 ± 11.4			**0.037**	NS	**0.031**
				OR [95%CI] (p-value)			
DNA fragmentation rate <14.0%, n (%)	110 (72.8%)	93 (67.[illegible])					
DNA fragmentation rate 14.0-29.9%, n (%)	30 (19.9%)	30 (21.9%)				[illegible]39 [0.80-2.41] (NS)	**2.45 [1.18-5.07] (0.016)**
DNA fragmentation rate ≥ 30 %, n (%)	11 (7.3%)	14 (10.2%)	5 (11.6%)				

CONTROVERSE

L'obésité (et surpoids) ↗ risque de présenter une fragmentation de l'ADN spermatique ↗ x2,45

Hôpitaux Universitaires Jean-Verdier Paris-Seine Saint-Denis

Hôpitaux Universitaires Paris Est TENON

American Hospital of Paris

22

vol.7 pp. 1704–1713, 2015
doi:10.1093/humrep/dev111

Reproductive epidemiology

No association between body mass index and sperm DNA integrity

I. Bandel[1,2,*], M. Bungum[1], J. Richtoff[2], J. Malm[3], J. Axelsson[1,2,4], H.S. Pedersen[5], J.K. Ludwicki[6], K. Czaja[6], A. Hernik[6], G. Toft[7,8], J.P. Bonde[9], M. Spanò[10], G. Malm[2], T.B. Haugen[11], and A. Giwercman[1,2,*]

Andrologia. 2017 Aug 30. doi: 10.1111/and.12889. [Epub ahead of print]

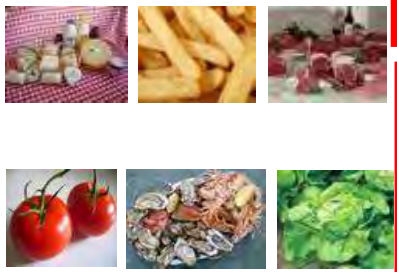
Full Text Online — Wiley Online Library

Association between body mass index and sperm quality and sperm DNA integrity. A large population study.

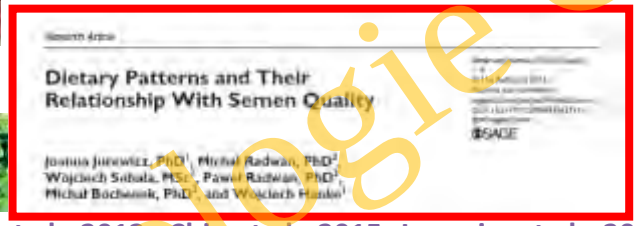
Oliveira JBA[1,2], Petersen CG[1,2], Mauri AL[1,2], Vagnini LD[2], Renzi A[2], Petersen B[2], Mattila M[1], Dieamant F[1,2], Baruffi RLR[1,2], Franco JG Jr[1,2].

REGIMES/ REPRODUCTION ♂

- **Alimentation et sperme**
  - ❖ nombre
  - ❖ ADN
  - ❖ ploïdie



A low intake of antioxidant nutrients is associated with poor semen quality in patients attending fertility clinics



Young et al., 2008; Mendiola et al., 2009 ; Vujkovic et al., 2009; Schmidt et al., 2012 ; Chiu et al., 2015; Jurewicz et al., 2017

-Régime méditerranéen et sperme

Cutilas-Tolin et al. HR 2015
Karrayiannis et al. HR 2016

Association between adherence to the Mediterranean diet and semen quality parameters in male partners of couples attempting fertility

Mediterranean and western dietary patterns are related to markers of testicular function among healthy men

- **Alimentation et ICSI**

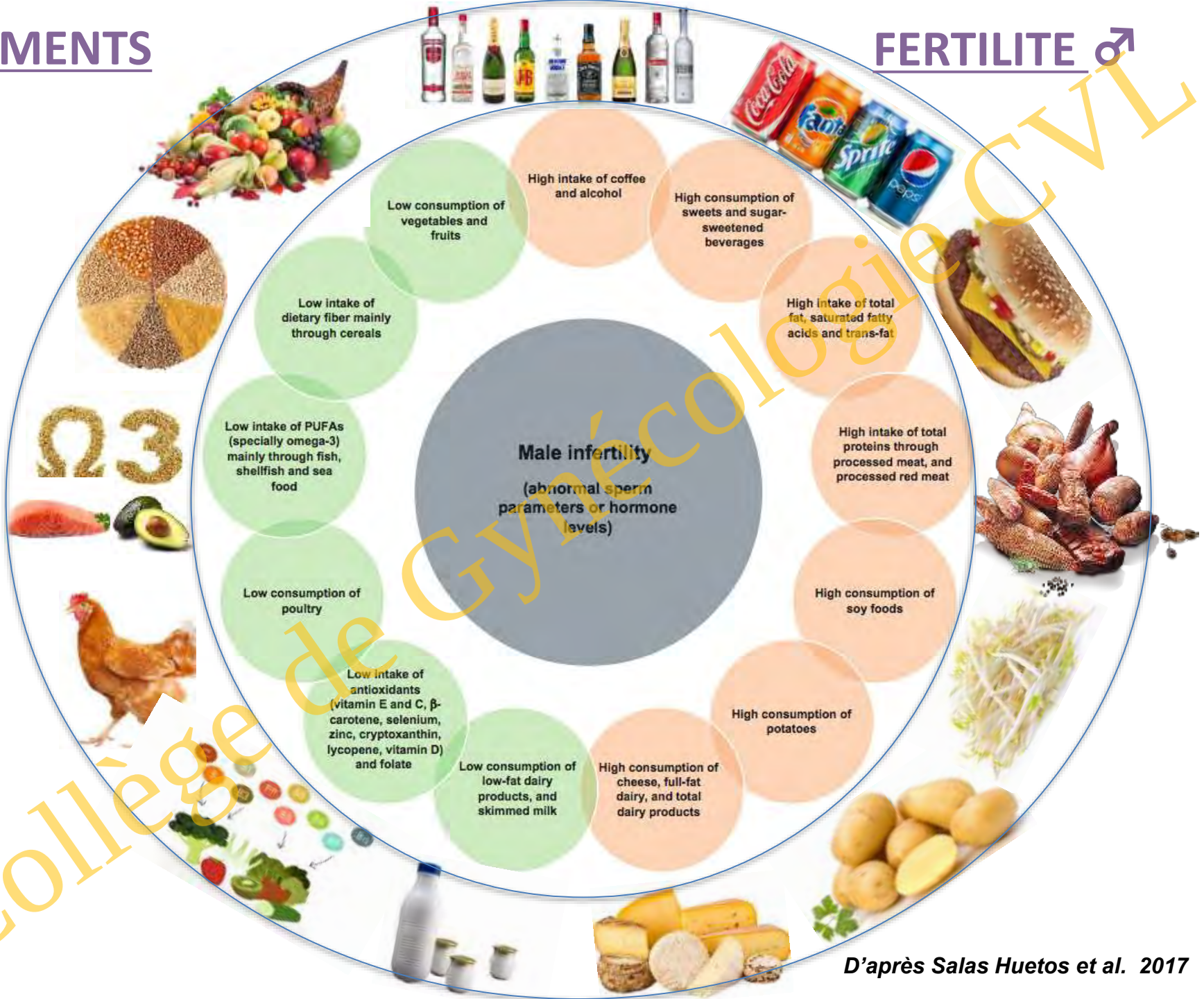
Food intake and social habits in male patients and its relationship to intracytoplasmic sperm injection outcomes

Vujkovic et al., 2010 ; Braga et al., 2012; Gaskins et al., 2012 ; Xia et al., 2016

Les régimes riches en antioxydants ont un effet protecteur sur la quantité/qualité du sperme et un résultat favorable sur l'issue en AMP

ALIMENTS

FERTILITE ♂



D'après Salas Huetos et al. 2017

INTERVENIR

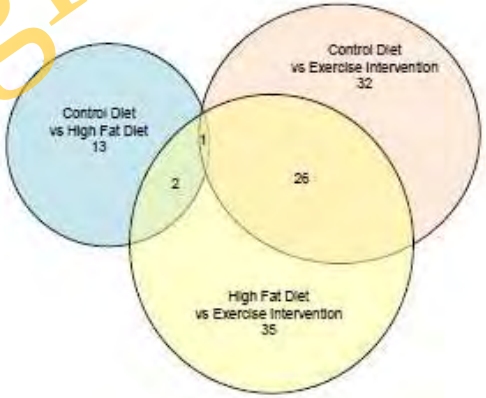
Chez les fils nés de pères obèses,
un environnement postnatal obésogène exacerbe les altérations métaboliques et spermatiques

La seule activité physique du père obèse
restaure chez le fils la régulation glucose et insuline par les cellules β pancréatiques + normalise les microARN

Fullston et al., 2012

ACTE I

McPherson et al., 2017

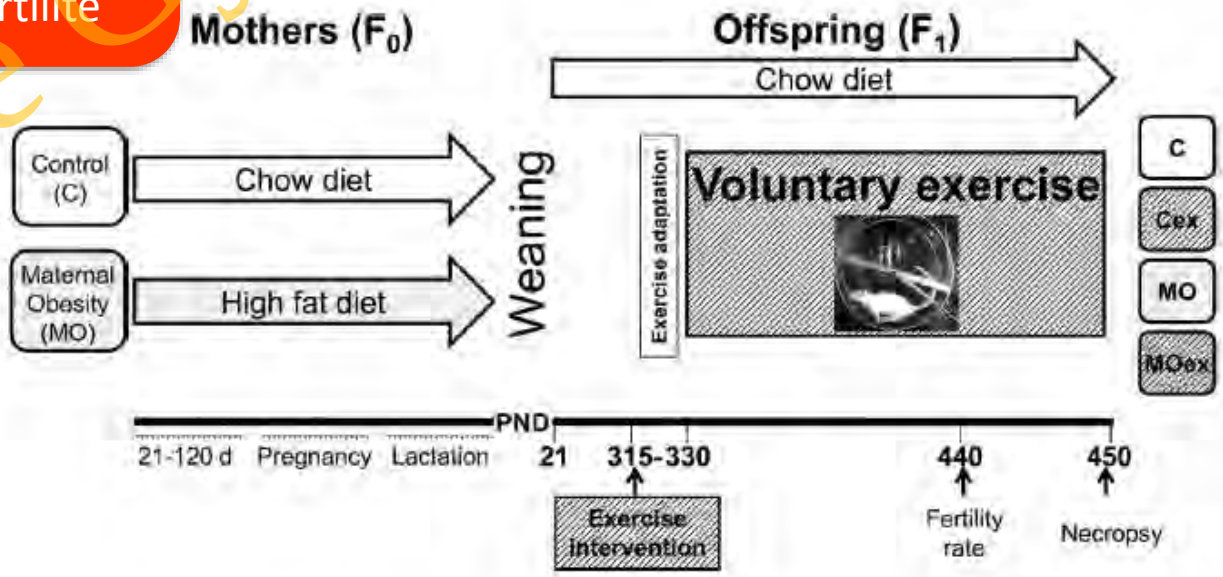


Chez les fils nés de mères obèses,
la seule activité physique du fils
améliore le stress ox testiculaire, ↗ la qualité du sperme et ↗ leur fertilité

ACTE II

"Il n'est jamais trop tard."

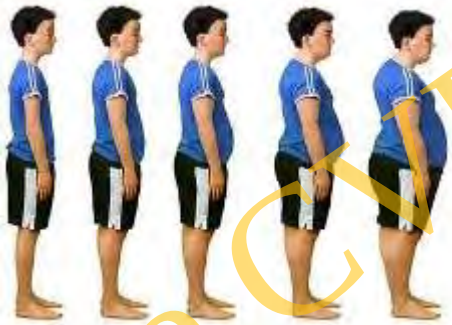
Santos et al., 2015



frontiers in Physiology

ORIGINAL RESEARCH
published: 02 November 2017
doi: 10.3389/fphys.2017.00897

INTERVENIR



A High Fat Diet during Adolescence in Male Rats Negatively Programs Reproductive and Metabolic Function Which Is Partially Ameliorated by Exercise

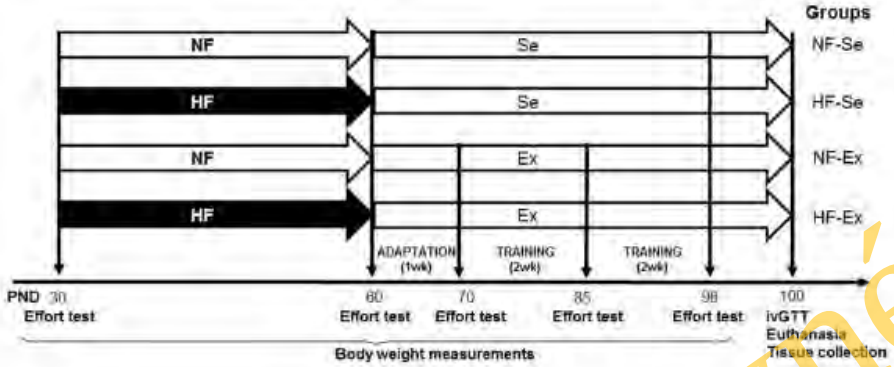
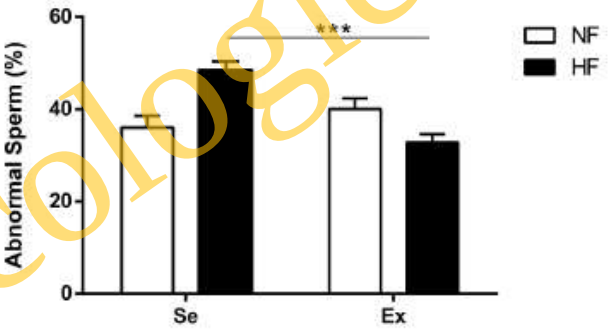


FIGURE 1 | Experimental design. NF, normal fat diet animals; HF, high fat diet animals; Se, sedentary animals; Ex, exercised animals.



	Se		Ex	
	NF	HF	NF	HF
TESTIS				
Sperm number ($\times 10^6$)	134.8 ± 8.3	114.3 ± 16.4	148.7 ± 13.7	135.1 ± 12.0
Sperm number per gram ($\times 10^6$)	119.7 ± 10.9	101.4 ± 7.5	115.2 ± 7.9	102.9 ± 8.7
Daily sperm production ($\times 10^6$)	22.1 ± 1.3	18.7 ± 2.7	24.4 ± 2.2	22.1 ± 1.9
CAPUT AND CORPUS EPIDIDYMIS				
Sperm number ($\times 10^6$)	78.4 ± 22.5	58.1 ± 10.5	73.4 ± 4.2	76.6 ± 7.3
Sperm number per gram ($\times 10^6$)	305.3 ± 82.5	219.4 ± 41.7	284.4 ± 17.8	272.2 ± 32.2
Transit time (days)	3.7 ± 1.0	3.1 ± 0.6	3.3 ± 0.5	3.3 ± 0.4
CAUDA EPIDIDYMIS				
Sperm number in ($\times 10^6$)	130.5 ± 2.6^a	78.3 ± 15.0^b	78.8 ± 14.3^b	85.1 ± 3.1^{ab}
Sperm number per gram ($\times 10^6$)	745.4 ± 20.6^a	389.8 ± 62.8^a	416.2 ± 95.7^a	458.2 ± 31.4^a
Transit time (days)	6.3 ± 0.3	3.9 ± 0.6	3.5 ± 0.7	3.4 ± 0.3

Une alimentation riche en graisse pendant l'adolescence peut avoir des conséquences à long terme sur les fonctions métaboliques + de reproduction; cet impact peut être réduit par l'exercice physique

COMPLEMENTS ALIMENTAIRES ?

Cochrane Library

Cochrane Database of Systematic Reviews

Antioxidants for male subfertility (Review)

Showell MG, Mackenzie-Proctor R, Brown J, Yazdani A, Stankiewicz MT, Hart RJ

Amélioration de la qualité spermatique et taux de grossesse clinique mais
…faible et très faible niveau de preuve

Antioxidants versus placebo or no treatment for male subfertility

Patient or population: patients with male subfertility
Settings:
Intervention: Antioxidants versus placebo or no treatment

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Antioxidants versus placebo or no treatment				
Live Birth per couple randomised Follow-up: 3 - 24 months	50 per 1000	181 per 1000 (99 to 309)	OR 4.21 (2.08 to 8.51)	277 (4 studies)	⊕⊕◯◯ low[1,2]	
Clinical Pregnancy rate per couple randomised Follow-up: 3-24 months	59 per 1000	177 per 1000 (108 to 277)	OR 3.43 (1.92 to 6.11)	522 (7 studies)	⊕⊕◯◯ low[1,3]	
Adverse event: Miscarriage rate per couple randomised Follow-up: 3-18 months	19 per 1000	33 per 1000 (8 to 129)	OR 1.74 (0.40 to 7.60)	247 (3 studies)	⊕◯◯◯ very low[1,4]	

CHIRURGIE BARIATRIQUE ?

Secondary male factor infertility after Roux-en-Y gastric bypass for morbid obesity: Case report

Antonio Scotto di Frega[1], Brian Dale[1], Loredana Di Matteo[1,2] and Martin Wilding[1,3]

ARTICLE

Sperm parameters and male fertility after bariatric surgery: three case series

Nathalie Sermondade [a,b,c], Nathalie Massin [c,d], Florence Boitrelle [a,f], Jérôme Pfeffer [d], Florence Eustache [a], Christophe Sifer [b], Sebastien Czernichow [f], Rachel Levy [a,b]

Table 1 Follow up of patients with weight loss and consequences on sperm parameters and results of IVF procedures.

Time to treatment	Patient 1 (30 years old; sleeve gastrectomy)			Patient 2 (41 years old; bypass)			Patient 3 (30 years old; bypass)		
	−12 months	+10 months	+24 months	−12 months	+6 months	+15 months	−9 months	+3 months	+6 months
BMI (kg/m^2)	65.7	33.4	33.4	53.5	30.4	30.4	38.6	31.5	27.5
Sperm concentration (10^6/ml)	48	0.9	41	0.8	<0.01	0.2	6	0.9	0.3
Progressive sperm motility (a + b) (%)	35	10	40	25	0	10	6	4	7
Normal sperm morphology (%)[a]	7	6	8	13	NA	NA	1	0	0
Hormonal profile	Normal	Normal	NA	Normal	Normal	NA	NA	NA	Normal
Assisted reproductive treatment	None	2 ICSI	1 ICSI	None	None	1 ICSI	1 ICSI	Frozen–thawed embryo transfer	1 ICSI
Outcome	No pregnancy	No pregnancy	Clinical pregnancy	No pregnancy	No pregnancy	Clinical pregnancy	Spontaneous miscarriage	No pregnancy	In progress

BMI = body mass index; ICSI
[a]Morphology according to

Un effectif de cohorte plus important
Un suivi plus long

CONTROVERSE

ARTICLE

Effect of bariatric surgery on semen parameters and sex hormone concentrations: a prospective study

Sleeve
12 mois
46 patients

Figure 1 Changes in sperm … in the azoospermia group. … r bariatric surgery

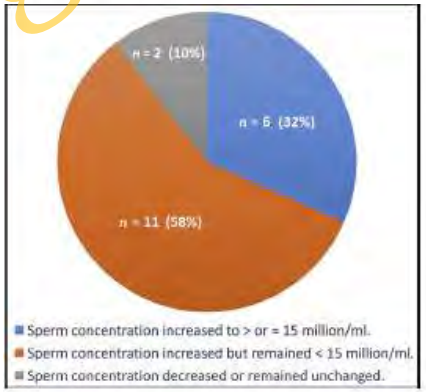


Figure 2 Changes in sperm concentration after bariatric surgery in the oligospermia group.

OBES SURG (2018) 28:69–76
DOI 10.1007/s11695-017-2802-7

ORIGINAL CONTRIBUTIONS

Massive Weight Loss Obtained by Bariatric Surgery Affects Semen Quality in Morbid Male Obesity: a Preliminary Prospective Double-Armed Study

Jinous Samavat[1] · Giulia Cantini[1] · Francesco Lotti[2] · Alessandra Di Franco[1] · Lara Tamburrino[2] · Selene Degl'Innocenti[2] · Elisa Maseroli[2] · Erminio Filimberti[2] · Enrico Facchiano[3] · Marcello Lucchese[3] · Monica Muratori[2] · Gianni Forti[1] · Elisabetta Baldi[2] · Mario Maggi[2] · Michaela Luconi[1]

Published online: 12 July 2017

Roux en Y Bypass
6 mois
31 patients

Table 2 Changes in the seminal parameters in the prospective longitudinal survey

Seminal parameter	Operated (OP) $n = 23$				Nonoperated (NOP) $n = 8$			
	T0	T1	P	Δ_{T1-T0}	T0	T1	P	Δ_{T1-T0}
Progressive motility (%)	38.9 ± 19.7	43.0 ± 21.1	0.231	4.8 ± 16.8	40.3 ± 21.2	38.7 ± 20.7	0.856	−1.7 ± 20.6
Total motility (%)	48.7 ± 19.3	55.2 ± 20.6	0.112	7.0 ± 18.1	47.7 ± 31.4	47.7 ± 17.8	0.835	2.5 ± 22.0
Morphology (%)	8.5 ± 7.8	5.0 ± 4.6	0.057	−3.3 ± 6.8	8.8 ± 4.7	4.0 ± 2.5	0.057	−4.8 ± 4.8
Viability (%)	68.6 ± 13.4	79.5 ± 10.3	**0.029**	10.6 ± 16.2	60.0 ± 33.4	79.2 ± 9.4	0.423	18.7 ± 32.3
Sperm number (millions)	130.0 ± 150.0	150.0 ± 230.0	0.632	20.5 ± 203.3	70.0 ± 77.0	70.0 ± 130.0	0.999	−0.065 ± 123.0
Sperm concentration (mil/ml)	83.0 ± 100.0	55.00 ± 63.0	0.100	28.4 ± 79.2	16.0 ± 19.0	16.0 ± 23.0	1.000	0.00 ± 6.7
Volume (ml)	2.2 ± 1.5	2.8 ± 1.4	**0.044**	0.6 ± 1.4	3.4 ± 1.7	3.2 ± 2.4	0.885	0.1 ± 1.75
pH	7.65 ± 0.21	7.57 ± 0.18	0.142	−0.08 ± 0.2	7.70 ± 0.41	7.55 ± 0.25	0.149	−0.19 ± 0.30
IL-8 (ng/ml)	8.85 ± 5.60	6.56 ± 5.31	0.245	−1.90 ± 5.61	7.0 ± 8.0	10.1 ± 8.6	0.351	2.42 ± 5.76
Brighter sDF (%)	24.4 ± 13.4	18.2 ± 7.1	0.325	−4.9 ± 17.1	27.5 ± 9.5	39.7 ± 28.9	0.669	21.7 ± 53.7
Dimmer sDF (%)	20.4 ± 15.3	13.7 ± 13.0	0.495	−4.2 ± 17.6	12.1 ± 3.6	17.6 ± 9.2	0.818	−0.7 ± 3.6
Total SDF (%)	44.8 ± 23.0	31.9 ± 15.7	0.223	−9.1 ± 26.6	39.6 ± 12.7	57.3 ± 23.7	0.659	21.0 ± 50.1

INTERVENTION PERICONCEPTIONNELLE : PLATEFORME WEB

JMIR MHEALTH AND UHEALTH Van Dijk et al.

Original Paper

Impact of an mHealth Platform for Pregnancy on Nutrition and Lifestyle of the Reproductive Population: A Survey

Matthijs R Van Dijk[1], MD; Nicole A Huijgen[1], MD; Sten P Willemsen[2], MSc; Joop SE Laven[1], MD, PhD; Eric AP Steegers[1], MD, PhD; Régine PM Steegers-Theunissen[1], MD, PhD

Evaluer la compliance, la facilité d'utilisation et l'efficacité d'une plateforme web pour l'amélioration des facteurs de vie en période périconceptionnelle :

« **mHealth platform, *Smarter pregnancy*** »

→Coaching personnel online de 6 mois

Apports adéquats quotidiens recommandés aux Pays Bas :

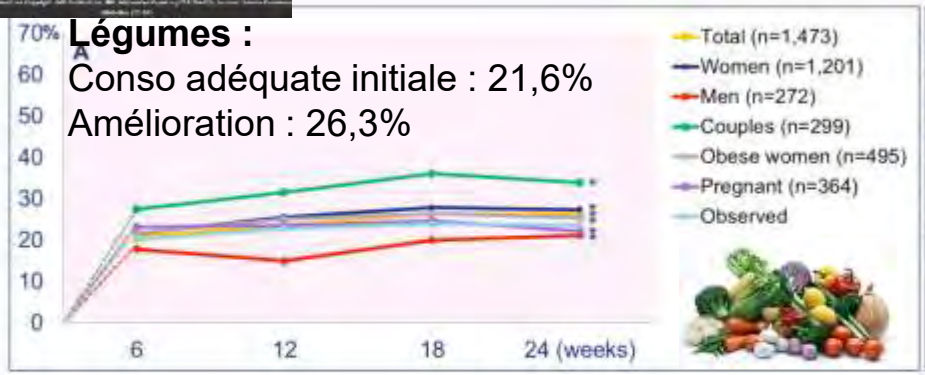
≥ 200g de légumes, ≥ 2 fruits, 400µg ac folique, pas de tabac, pas d'alcool

The Netherlands Nutrition Centre. 2015. Zwangerschap URL: http://www.voedingscentrum.nl/professionals/zwangerschap .

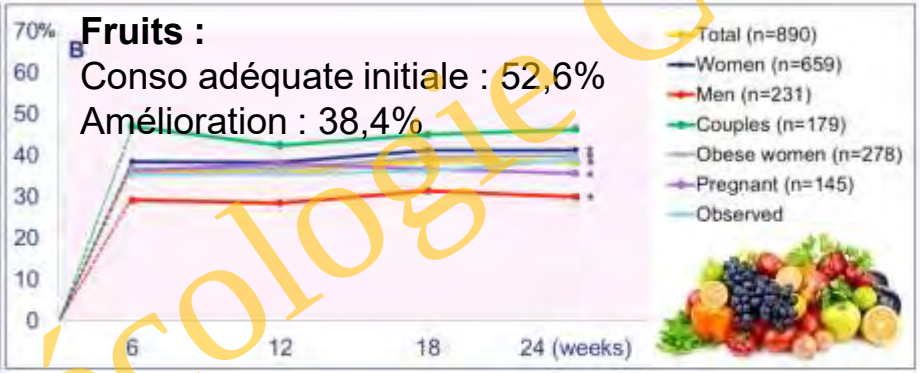
https://www.slimmerzwanger.nl/nl/

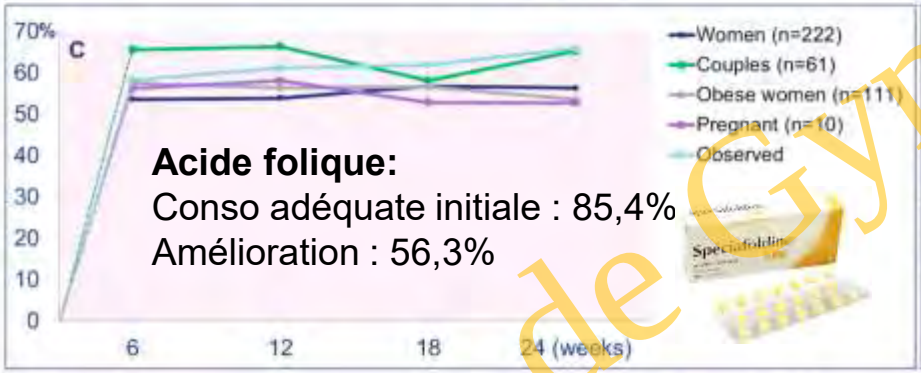
COACHING PERSONNEL ONLINE : RESULTATS A 6 MOIS

Légumes :
Conso adéquate initiale : 21,6%
Amélioration : 26,3%



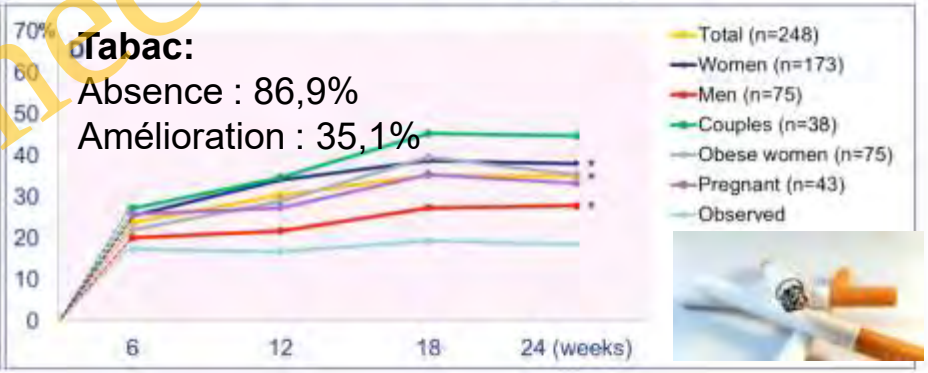
Fruits :
Conso adéquate initiale : 52,6%
Amélioration : 38,4%

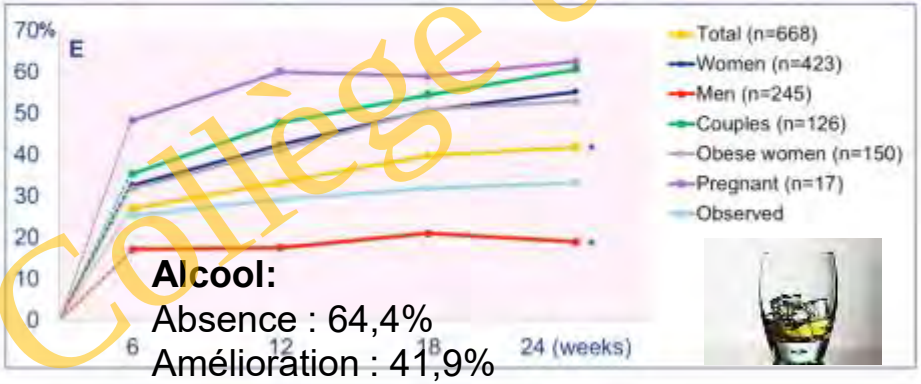




Acide folique:
Conso adéquate initiale : 85,4%
Amélioration : 56,3%

Tabac:
Absence : 86,9%
Amélioration : 35,1%





Alcool:
Absence : 64,4%
Amélioration : 41,9%

Compliance 54,7%

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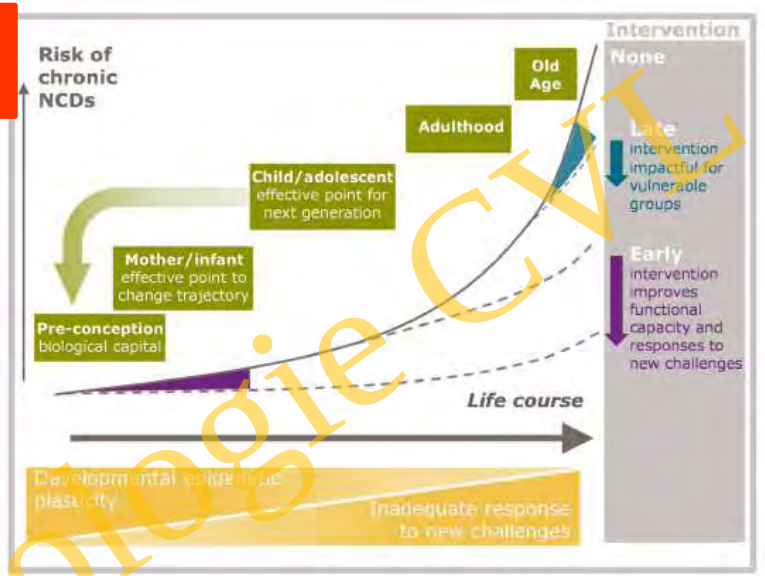

PARCOURS ENVIRONNEMENT PERICONCEPTIONNEL DU COUPLE INFERTILE

Prise en charge personnalisée globale du couple

Santé du couple et la qualité de leurs gamètes

Grossesse spontanée (DNC)

Qualité embryon et taux de naissance (AMP)

Santé de l'enfant

Evaluation médico-économique