



The Obesity Epidemic and Women's Health

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ASOG

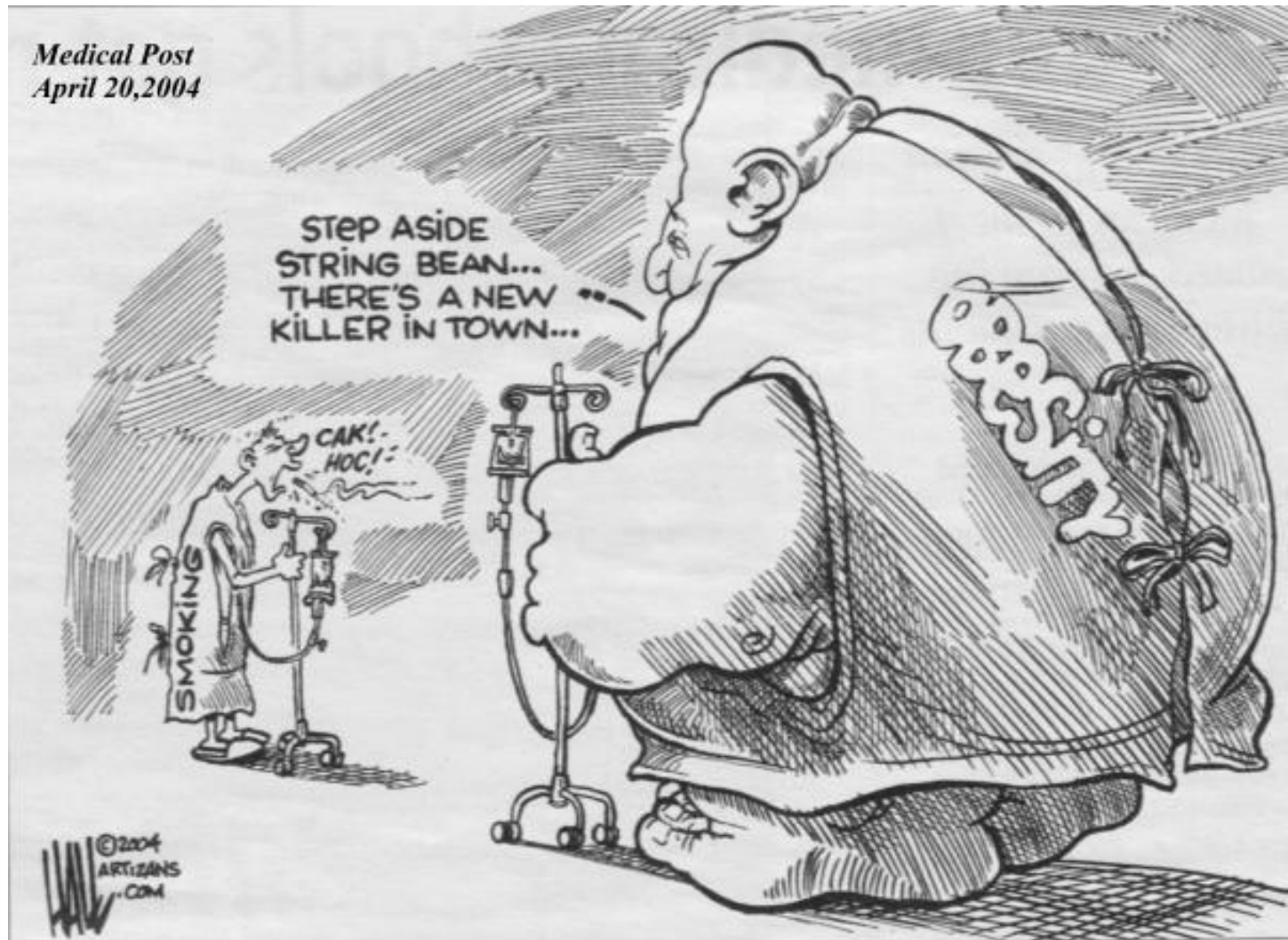


Objectives

- Review epidemic
- Affects on Pregnancy
- Affects on Fertility
- Affects on General Health



Medical Post
April 20, 2004





My experience

- Frequently see patients with BMI > 50 (My patient 5'1" / 262 lbs)
- Patients informed bad outcomes with morbid obesity
- Offered fertility drugs only if lost 5% body weight
- 2003 my patient died
- 26 years old



Definition

- BMI currently standard for definition
 - ? waist / hip ratio
- $Wt(kg) / ht(m)^2$
- <18.50 underweight
- $18.50 - 24.99$ acceptable
- Overweight $25.0 - 29.99$
- Obese ≥ 30.0
- ? Morbid obesity



Risks of Obesity



-
- Infertility
 - First trimester and recurrent miscarriage
 - GHT and Pre-eclampsia
 - GDM
 - LGA >4000 gm, >4500 gm
 - C/S
 - Infection
 - Blood loss
 - Lower breast feeding rate



Risks of Obesity

- CVD
- BP
- Hyperlipidemia
- Diabetes
- PE
- Sleep Apnea
- Chronic fatigue
- Insomnia
- Endometrial Hyperplasia
- Arthritis
- Knee replacement
- Cholecystectomy
- Surgical risk
- False positive mammograms



Obesity and Pregnancy

- Studies worldwide
- Europe
- North AM
- Middle East
- All discuss major concern



Cedergren

Sweden, OG, Feb 2004

Data base 805,275 singletons prospective database, 2001

Compared 3480 BMI > 40; 12698 BMI 35.1 – 40; 535,900 BMI 19.8 – 26

Morbidly obese

- 4.82 pre-eclampsia
- 2.79 ante-partum SB
- 2.69 C/S
- 1.34 operative delivery
- 3.14 shoulder dystocia
- 2.85 meconium aspiration
- 2.52 fetal distress
- 3.41 early NN death
- 3.82 LGA

BMI 35.1 – 40

- 3.90 pre-eclampsia
- 1.99 ante-partum SB
- 2.32 C/S
- 1.18 operative delivery
- 2.82 shoulder dystocia
- 2.87 meconium aspiration
- 2.13 fetal distress
- 2.09 early NN death
- 3.11 LGA (>2 SD)



Lacoursiere, Utah

- Data base compared 1991-2001
- 40.2% ↑ pre-preg overweight and obesity
- If C/S 1 in 7 attributable to obesity
- Same increase complications noted



Other studies similar

- Murakmi, Japan, BMI >25
 - GDM 7.94, Pre-eclampsia 8.13, CS 2.42
- Jensen, Denmark, glucose tolerant,
 - BMI >30 sig ↑pre-eclampsia, PIH , CS, induction labour (not induced for ↑ BP)
- Kiran, Wales, BMI ≤30 vs > 30
 - Postdates, Induction, C/S, LGA, shoulder dystocia, failed instrumental delivery, ↑ blood loss >500ml, UTI, NN admissions



Robinson, Halifax

- 1988-2002 obesity 5 % - 10%
- Pre-preg, <90 kg NO,
90-120 kg MO, >120kg SO
 - 198 lbs, 6ft = BMI 27.5, 5ft9in = BMI 30
- sig ↑ post term, macrosomia, shoulder dystocia, asphyxia, RDS(1.45), phototherapy, SCN admission, SB(1.44)
- Sig ↓PTB, LBW



Kristensen, Denmark

BJOG, April 2005, vol 112, pp.403-408

- Risk SB and NND
- BMI <18.5, 18.5-24.9, 25.0-29.9, 30.0+
- SB OR 2.8, NND OR 2.6
- Still sig when BP and diabetes assessed



Obesity and Diabetes in pregnancy

- Lombardi, San Antonio, Texas
 - GDM patients, if obese, needed insulin to achieve outcomes similar to GDM without obesity despite similar glycemic control with diet
- Clausen, Denmark
 - Outcome GDM worse than type I despite similar glycemic control.



Other outcomes

- Cedergren, Sweden
 - BMI >29 oral facial clefts 1.30 OR
- Cedergren, Sweden
 - CVDefects
 - BMI > 29 1.18 overall, 1.23 severe
 - BMI > 35 1.40 overall, 1.69 severe
- Ray, Toronto
 - NTD OR 1.4 obese,
 - after flour fortification, OR 2.8
- Honein, Atlanta
 - Obesity + sub-fertility OR 8.5 renal defects



Effects of gestational weight gain and BMI on obstetric outcome

Cedergren, International Journal of O&G (2006) 93, 269-274

- 245,526 singleton term Jan 1,1994 – Dec 31,2002
- 5 categories BMI
- 3 weight gain categories
- Adjusted for age, parity, smoking, year of birth
- 2 fold inc pre-eclampsia



245,526 with pre-preg ht & wt and also gest weight change

- < 8kgs
 - 8-16 kgs
 - >16 kgs
 - BMI <20, Under wt
 - 20-24.9, ave
 - 25-29.9, over wt
 - 30-34.9 obese
 - ≥ 35 morbid obesity
- 368,063 /
652,034 (57%)
had normal BMI



Obstetric and Neonatal outcomes of women with gestational weight gains of less than 8kg according to each BMI class

Outcome	Body Mass Index				
	<20	20-24.9	25-29.9	30-34.9	≥35
	OR ^a	OR ^a	OR ^a	OR ^a	OR ^a
Preeclampsia	0.90	0.73	0.64	0.52	0.63
LGA	0.43	0.53	0.48	0.66	0.54
SGA	2.35	1.99	1.75	1.68	1.71
Cesarean section	1.07	0.98	0.88	0.81	0.75
Instrumental Delivery	0.89	0.88	0.85	0.75	0.83
Post-term (>41 weeks)	0.66	0.86	1.08	1.23	1.25
Fetal Distress	1.05	1.06	0.96	1.21	0.59
Low Apgar Score	1.01	1.05	1.05	0.92	0.84

Gestational weight gain of 8 -16 kg was set as reference.

^aAdjustments were made for maternal age, parity, smoking in early pregnancy, and year of birth.



Table 4 Obstetric and neonatal outcomes of women with gestational weight gain of less than 8 kg according to each BMI class

Outcome	Body mass index				
	<20	20–24.9	25–29.9	30–34.9	≥ 35
	OR ^a (95% CI)	OR ^a (95% CI)	OR ^a (95% CI)	OR ^a (95% CI)	OR ^a (95% CI)
Preeclampsia	0.90 (0.55–1.48)	0.73 (0.61–0.89)	0.64 (0.54–0.76)	0.52 (0.42–0.62)	0.63 (0.51–0.79)
LGA	0.43 (0.24–0.75)	0.53 (0.47–0.61)	0.48 (0.43–0.53)	0.66 (0.59–0.75)	0.54 (0.46–0.63)
SGA	2.35 (1.92–2.88)	1.99 (1.77–2.23)	1.75 (1.48–2.07)	1.68 (1.26–2.25)	1.71 (1.03–2.85)
Cesarean section	1.07 (0.89–1.29)	0.98 (0.92–1.05)	0.88 (0.82–0.95)	0.81 (0.73–0.90)	0.75 (0.66–0.87)
Instrumental delivery	0.89 (0.71–1.11)	0.88 (0.80–0.96)	0.85 (0.76–0.95)	0.75 (0.63–0.88)	0.83 (0.65–1.03)
Post-term (>41 weeks)	0.66 (0.27–1.63)	0.86 (0.64–1.16)	1.08 (0.87–1.42)	1.23 (0.84–1.79)	1.25 (0.66–2.37)
Fetal distress	1.05 (0.54–2.03)	1.06 (0.81–1.40)	0.96 (0.70–1.32)	1.21 (0.79–1.85)	0.59 (0.28–1.25)
Low Apgar score	1.01 (0.60–1.69)	1.05 (0.87–1.27)	1.05 (0.85–1.29)	0.92 (0.69–1.24)	0.84 (0.57–1.24)

Gestational weight gain of 8–16 kg was set as reference.

^a Adjustments were made for maternal age, parity, smoking in early pregnancy, and year of birth.



Obstetric and Neonatal outcomes of women with gestational weight gains of more than 16 kg according to each BMI class

Outcome	Body Mass Index				
	<20	20-24.9	25-29.9	30-.34.9	≥35
	OR ^a	OR ^a	OR ^a	OR ^a	OR ^a
Preeclampsia	2.23	2.31	1.88	1.65	1.50
LGA	3.26	2.73	2.14	2.24	1.54
SGA	0.50	0.50	0.57	0.61	0.50
Cesarean Section	1.29	1.24	1.23	1.22	1.27
Instrumental Delivery	1.28	1.19	1.14	1.09	1.04
Post-term (>41 weeks)	0.88	0.87	0.82	0.78	1.11
Fetal Distress	0.86	1.08	1.31	1.02	2.15
Low Apgar Score	1.38	1.02	1.00	0.83	1.02

Gestational weight gain 8 -16 kg was set as reference.

^a Adjustments were made for maternal age, parity, smoking in early pregnancy, and year of birth



Table 5 Obstetric and neonatal outcomes of women with gestational weight gain of more than 16 kg according to each BMI class

Outcome	Body mass index				
	<20	20–24.9	25–29.9	30–34.9	≥35
	OR ^a (95% CI)	OR ^a (95% CI)	OR ^a (95% CI)	OR ^a (95% CI)	OR ^a (95% CI)
Preeclampsia	2.23 (1.83–2.71)	2.31 (2.15–2.49)	1.88 (1.72–2.06)	1.65 (1.43–1.92)	1.50 (1.17–1.92)
LGA	3.26 (2.76–3.86)	2.73 (2.60–2.88)	2.14 (2.01–2.28)	2.24 (2.00–2.51)	1.54 (1.24–1.90)
SGA	0.50 (0.41–0.61)	0.50 (0.45–0.56)	0.57 (0.47–0.68)	0.61 (0.40–0.93)	0.50 (0.20–1.24)
Cesarean section	1.29 (1.17–1.43)	1.24 (1.19–1.29)	1.23 (1.17–1.30)	1.22 (1.10–1.35)	1.27 (1.05–1.52)
Instrumental delivery	1.28 (1.15–1.43)	1.19 (1.14–1.25)	1.14 (1.06–1.23)	1.09 (0.93–1.27)	1.04 (0.77–1.40)
Post-term (>41 weeks)	0.88 (0.56–1.39)	0.87 (0.74–1.03)	0.82 (0.66–1.03)	0.78 (0.50–1.21)	1.11 (0.51–2.41)
Fetal distress	0.86 (0.57–1.29)	1.08 (0.92–1.26)	1.31 (1.05–1.53)	1.02 (0.65–1.62)	2.15 (1.10–4.20)
Low Apgar score	1.38 (1.07–1.79)	1.02 (0.91–1.14)	1.00 (0.84–1.17)	0.83 (0.60–1.15)	1.02 (0.63–1.69)

Gestational weight gain of 8–16 kg was set as reference.

^a Adjustments were made for maternal age, parity, smoking in early pregnancy, and year of birth.



Inter-pregnancy weight change and risk of adverse pregnancy outcomes

Villamor, Cnattingius, LANCET 2006;368:1164-70

- Dept nutrition and epidemiology, Harvard
 - Swedish birth registry, change in pre-preg weight from 1st to 2nd pregnancy
 - Risk of adverse outcomes
151,025 women 1992 –2001
change in 3 or more BMI units vs
–1.0 to 0.9 units w odds ratios
 - Pre-eclampsia 1.78 (1.52-2.08)
 - GHT 1.76 (1.30-2.23)
 - GDM 2.09 (1.68-2.61)
 - C/S 1.32 (1.22-1.44)
 - SB 1.63 (1.20-2.21)
 - LGA 1.87 (1.72-2.04)
 - Linearly related to amt of weight change
 - Present even if healthy pre-pregnancy BMI for both pregnancies
- at 5'5½" 3 BMI units =18lbs**



Lactation

- Studies linking maternal obesity to failure to initiate breast feeding and childhood obesity
- Lack of breast feeding which can help with weight loss.



Anaesthesia

- Saravanakumar, Birmingham
 - Obesity and Obstetric Anaesthesia
 - Review article Anaesthesia, 2006, **61**, 36-48



Obesity and CS

- Dempsey, Seattle
 - >25 RR 2.09
 - >30 RR 3.05
- Sheiner, Israel
 - BMI <30 vs >30
 - FTP first stage OR 3.1, C/S OR 3.2
- Vahratian, Michigan C/S
 - 1.4 RRatio 1.4, 26.1-29.0;



Risk wound infection

Schneid-Kofman et al, Israel

- Obesity OR 2.2
- Hypertensive disorders 1.7
- PROM 1.5
- DM 1.4
- Emergency C/S 1.3
- Twins 1.6
- Combined obesity and diabetes 9.3



ACOG

- Communiqué ACOG outlining magnitude of problem.
- CDC and ACOG produced 3 documents for guidance
 - Exercise during pregnancy and postpartum period
 - Obesity in pregnancy
 - The role of the Obstetrician - Gynecologist in the assessment and management of Obesity



The role of the obstetrician – Gynecologist in the assessment and Management of Obesity

- Obesity independent risk factor for:
 - Spontaneous abortions (both after spontaneous pregnancies and infertility tx)
 - Complications previously discussed
- Operative and anaesthetic complications
- Record ht/wt first PN visit,
 - gain 25-35 lbs if normal, 15-25 lbs if overweight , 15 lbs if obese
- Offer nutrition consult, encourage exercise program
- Continue as above to lose weight before next pregnancy
- Consider screen for GDM at presentation and repeat 3rd trim
- Anaesthetic consultation
- Discuss difficulty with:
 - Estimating fetal weight even with US
 - Ext monitor FH
 - Toco
 - Performing C/S



ACOG committee opinion

- Pre or intra-partum early anaesthetic consult
- Antibiotic prophylaxis even if elective C/S
- Consider closure sub-cutaneous layers (works)
- Sub-cutaneous drains (maybe)
- Compression stockings, hydration, early mobilization during and after
- PP heparin (maybe)
- Consider extra resources (such as large OR table)
- VBAC rate very low



Bariatric Surgery

- Reports GI bleeding, IUGR, NTD, more recent OK
- Advise may become pregnant unexpectedly after surgery
- Delay pregnancy until 12-18 months to avoid rapid weight loss stage
- Gastric band may need to be adjusted
- Evaluate for nutritional deficiency and supplement vitamins



Infertility

- Recently studied
- ↓ Fertility if ovulatory dysfunction
- ↓ Fertility if not ovulatory dysfunction
- ↑ Pregnancy loss
- ART cannot overcome



Pregnancy losses

- Lashen, Sheffield
 - Database, all women having first baby
- Data re obstetric hx and BMI
 - (miscarriages only after 6 weeks) OR 1.2
- BMI 19-24.9 vs ≥ 30
- Early OR 1.2, Late OR 1, RPL OR 4
- GDM OR 13.05



Wang, Adelaide

- SA after ART tx
 - Overall risk 20%,
 - BMI:
 - <18.5 17%
 - 18.5 - 24.9 18%
 - 25 - 29.9 22%
 - 30 - 34.9 27%
 - ≥ 35 31%
- 36% in 40 =years
 - 35% if RPL previously



Fedorcsak, Oslo

- IVF, ICSI cycles + preg test
- BMI <25 or ≥ 25
- Obese fewer oocytes (8 vs 10)
- 22% vs 12% early ab , < 6 wks
- 63% vs 75% live birth rate



Bellver, Spain

- Donor egg cycles, good embryos, no uterine path, no APL or RPL
- Preg rate 50.6 %,
- Overall SA 15.8%
- BMI < 30 no differences found
- BMI \geq 30 SA rate 38.1%
- Trend to lower pregnancy and implantation rate in obese



Ferlitsch, Vienna

- Studied day 3 FSH and BMI pre IVF
- Also LH, E2, prl, endo thickness, protocol
- ↑ BMI 1 unit OR .84
- ↑ FSH 1unit OR .77



Linsten, Netherlands

- Compare delivery rate OR BMI < 27 vs ≥ 27 , smoking, sub-fertility cause, UI baseline
- Male OR 0.70
- Tubal OR 0.86
- Smoking OR 0.72 (16% vs 21% SA) rate
- Obesity OR 0.67
- Smoking and obesity \downarrow similar with age \uparrow 20 - 30 years



Message

- 50 % pregnancies not planned
- Pre-conceptual counseling should include everyone
- Proactive, don't wait to be asked or when they are ready to try
- Meds, drugs, Smoking, weight
- Rubella, folic acid



Recommendations

- Program for exercise and healthy eating in pregnancy
- If obese lose weight before referral
 - Might get pregnant and still morbidly obese !!!
- Weight loss program & gym fees tax deductible?
 - If weight loss sustained and documented by HCP
- ? Decreased insurance premiums



Second opinion
or
A different opinion ???!

"Hey, I came to you for a second opinion, and all I hear is what the first doctor told me!"

