

Pregnancy Weight Gain for Obese Women

- New Recommendations



FERNANDEZ
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Health Care for Women & the Newborn

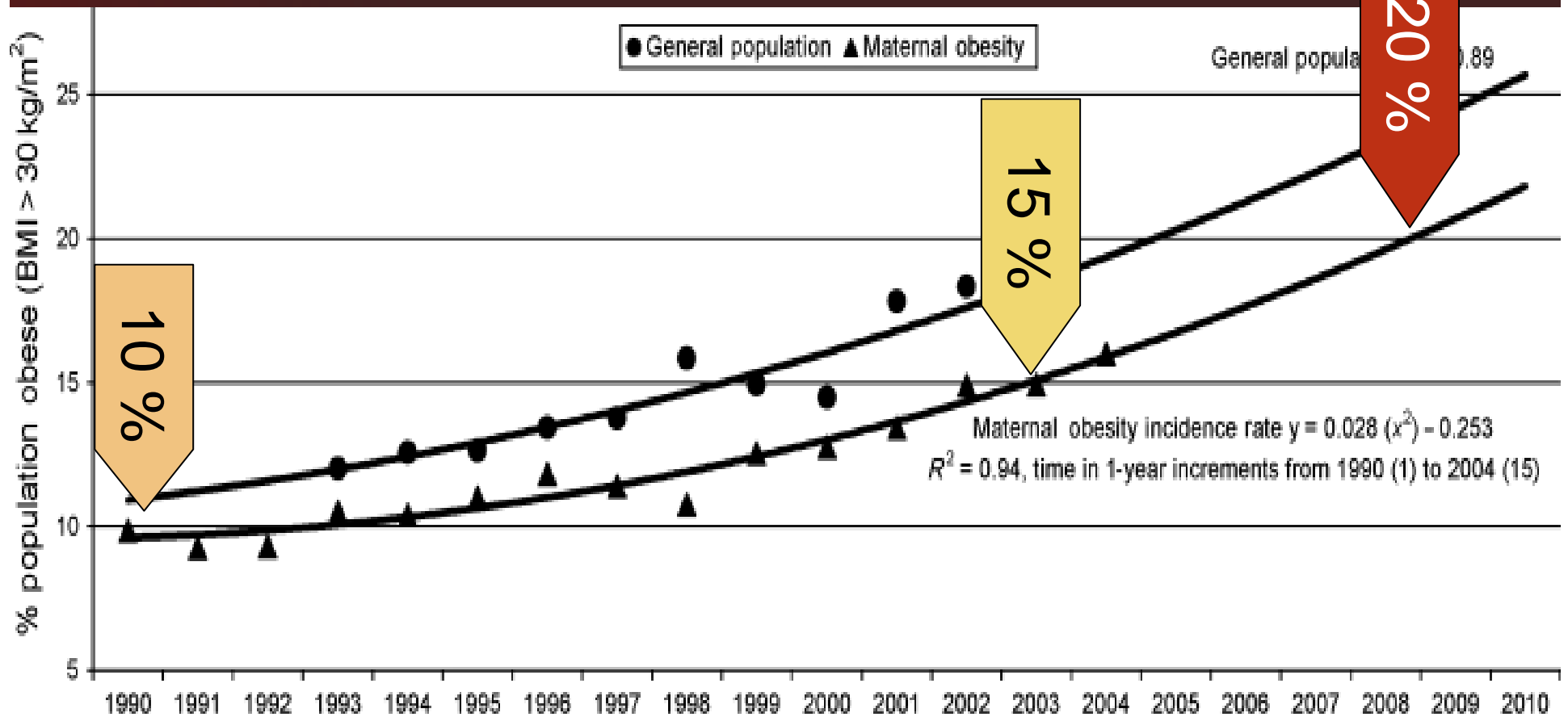
www.fernandezhospital.com



Global Paradox

**malnutrition / obesity
in the
same country**

WHO, 2004



BJOG 2007;114:187-194

THE HINDU

Online edition of India's National Newspaper

Monday, Dec 08, 2008

[ePaper](#) | [Mobile/PDA Version](#)

Other States

Ads by **Google**

[Int. Diabetes Monitor](#)

Keep abreast of current literature on clinical diabetes.

[InternationalDiabetesM](#)

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Obesity high among rural population: study

Staff Reporter

Educational , socio-economic status showed positive association in obesity and abdominal obesity



The Indian Stats, Obesity

South India, Rural women	21.8 %
Abdominal Obesity	30.9 %
National Data, Rural women	7 %

Study: 1,076 adults aged 20 years and above in Ramanathapuram and Thuthipet villages under the JIPMER Institute rural health centre 2006-2007

Maternal Obesity has Major Implications

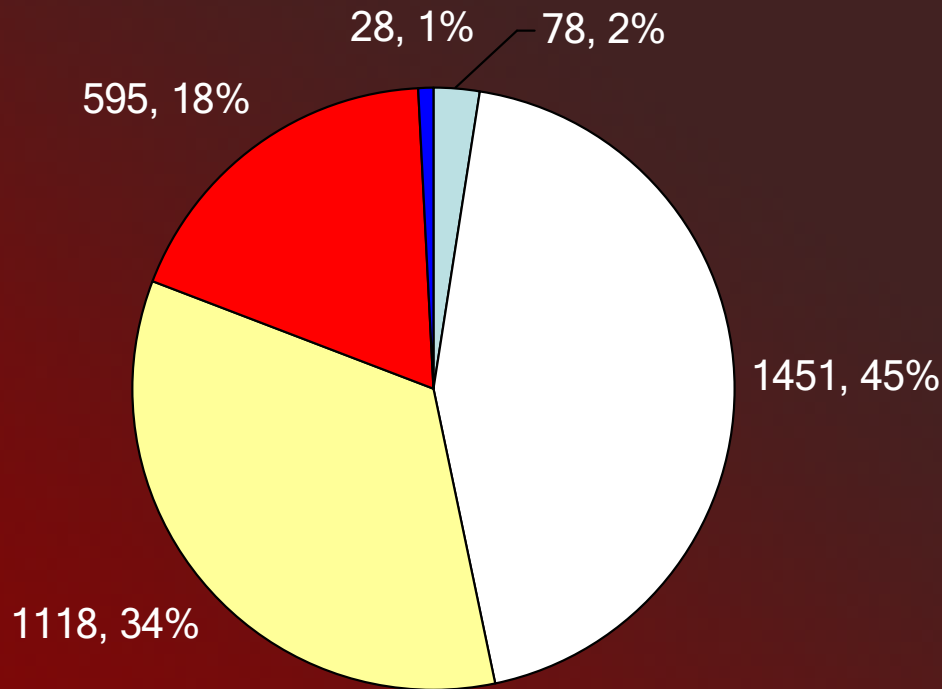
- Health care services
- Costs
- Psychological health of the mother

* Public health issue

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Statistics, Year 2007

4524 Births



19% of mothers had BMI > 30

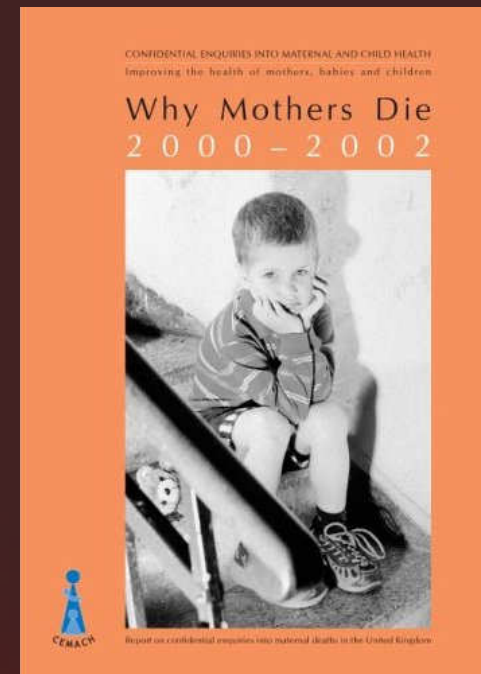
53% of mothers were either overweight or obese



Obesity - a risk factor

35% of

maternal deaths



**52 % of women
who died had
BMI > 25**



2003 - 2005

What is Obesity?

Excess body fat accumulation
with multiple organ - specific
pathological consequences

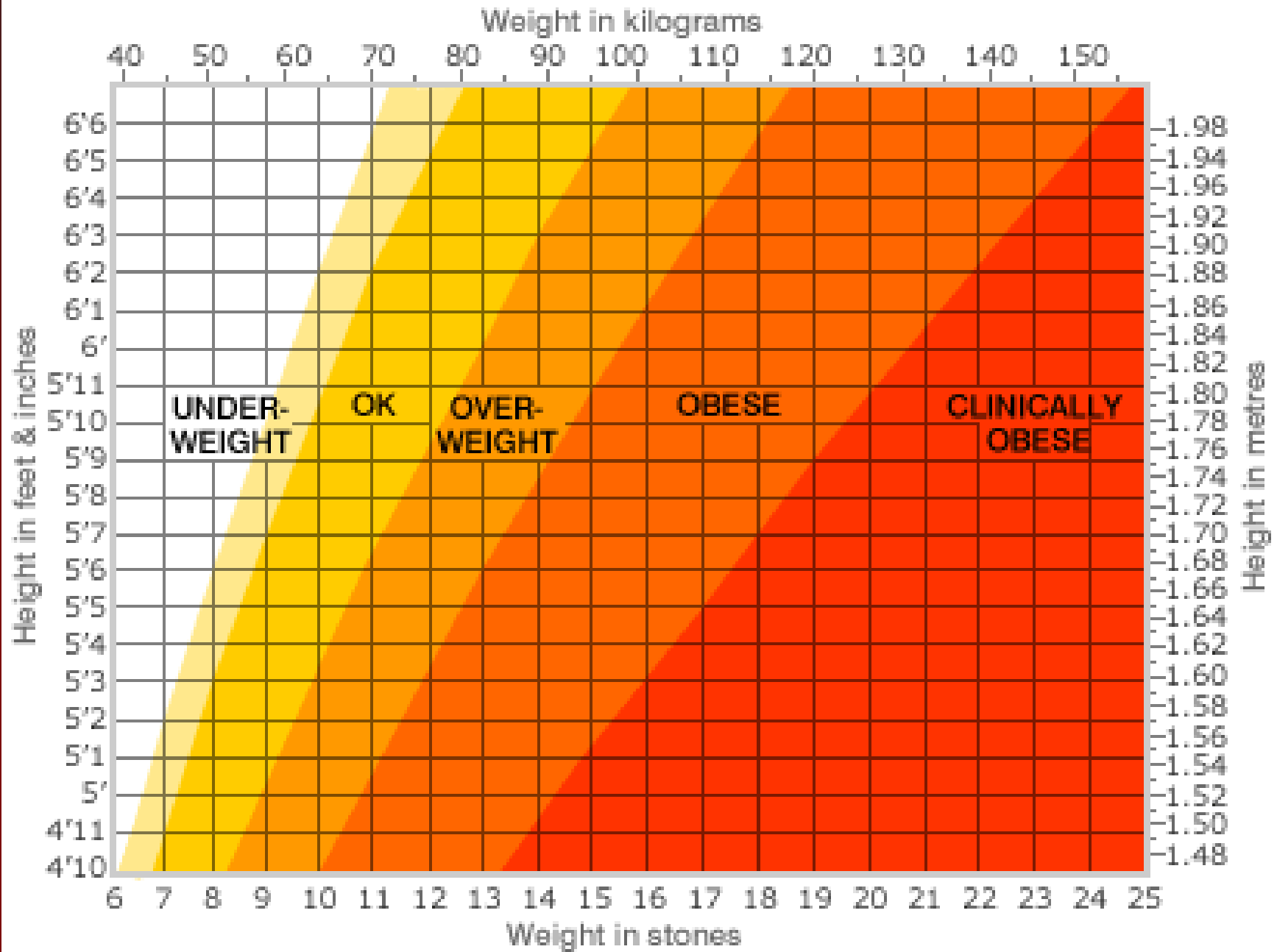


Definition

BMI = Body Mass Index

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height}^2 \text{ (m}^2\text{)}}$$

BMI > 30



BMI Distribution

Lean	< 18
Normal	18 - 24.9
Over weight	25 - 29.9
Obese	30 - 39.9
Morbidly obese	> 40

Measure of Obesity

- Waist Circumference
- Waist Hip Ratio
- Cut off: 80 cm for women
- Represents fat
 - Metabolically active fat
 - Intra abdominal



Waist circumference > 80 cm at 16 weeks,
Sattar et al, Obstet Gynecol 2001; 97: 268 -291

Pregnancy and Regional Fat Distribution and Central Adiposity

- During pregnancy : FAT is preferentially deposited in the femoral and abdominal regions
- Obese women developed more central obesity by 6 / 12 postpartum

Consequences of Obesity Obstetrics

Early Pregnancy

Miscarriage, Anomalies

Antenatal Period

HTN, GDM, VTE

Intrapartum Period

IOL, Cesarean Section

Postpartum Period

PPH, Infection, OASI

Fetal Effects

Stillbirths, LGA, Injuries

Long Term Effects

Baby & Mother

Infertility / Miscarriage

- Decreases the chances of spontaneous conception with normal ovulation
- Every BMI unit > 29 , probability of pregnancy decreases by 4%

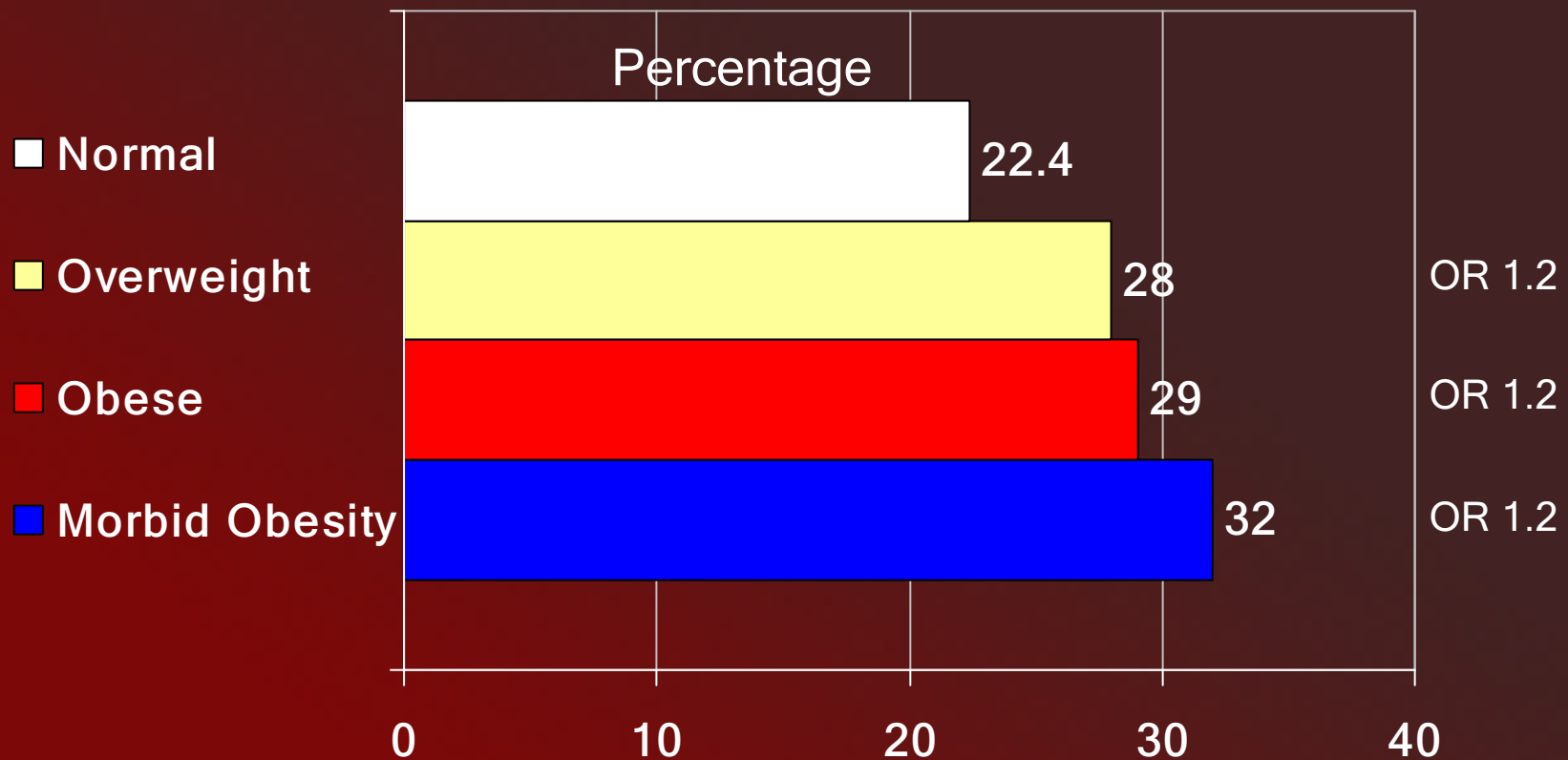
Maternal Age > 30 with obesity

Risks Associated with Maternal Obesity

- Increased risk of first trimester and recurrent miscarriage

Hum Reprod 2004;19:1644-6

History of Miscarriage



Mantel-Haenszel ORs adjusted for age

Maternal Risk

- Antenatal
 - Abdominal palpation
 - USG Assessment
 - BMI > 90th Centile : Significant decrease in prenatal diagnosis of birth defects

Obstet Gynecol 1990 ;76:339-42

Fetal Complications, BMI > 31

Increased Defects

- Neural tube
- CNS
- Great vessels of the heart
- Intestinal
- Ventral wall

Maternal Risk

- GDM
- Hypertensive disorders

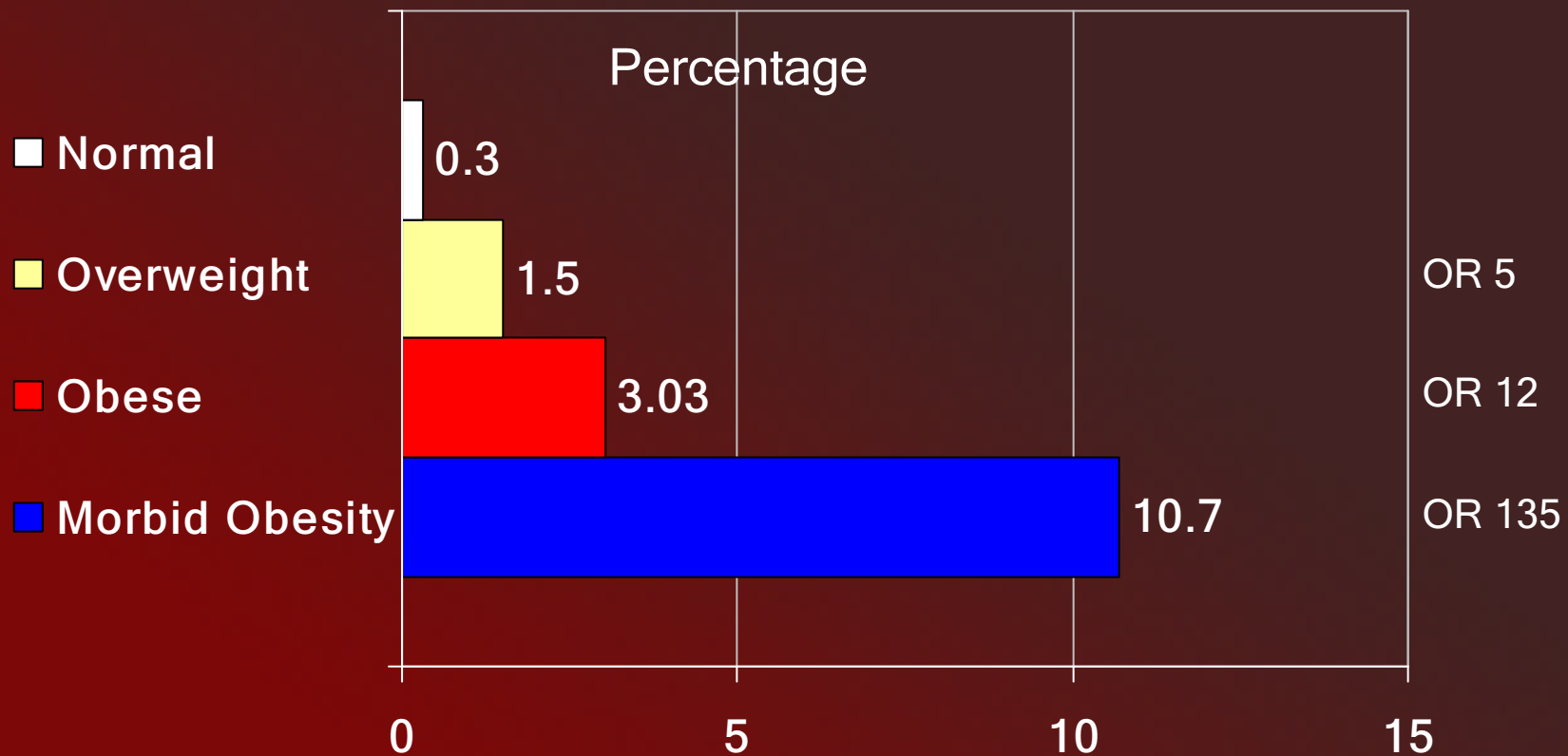
*** Risk escalates with degree of obesity**

J Obstet Gynaecol 1999; 19:474 - 6

Hypertension

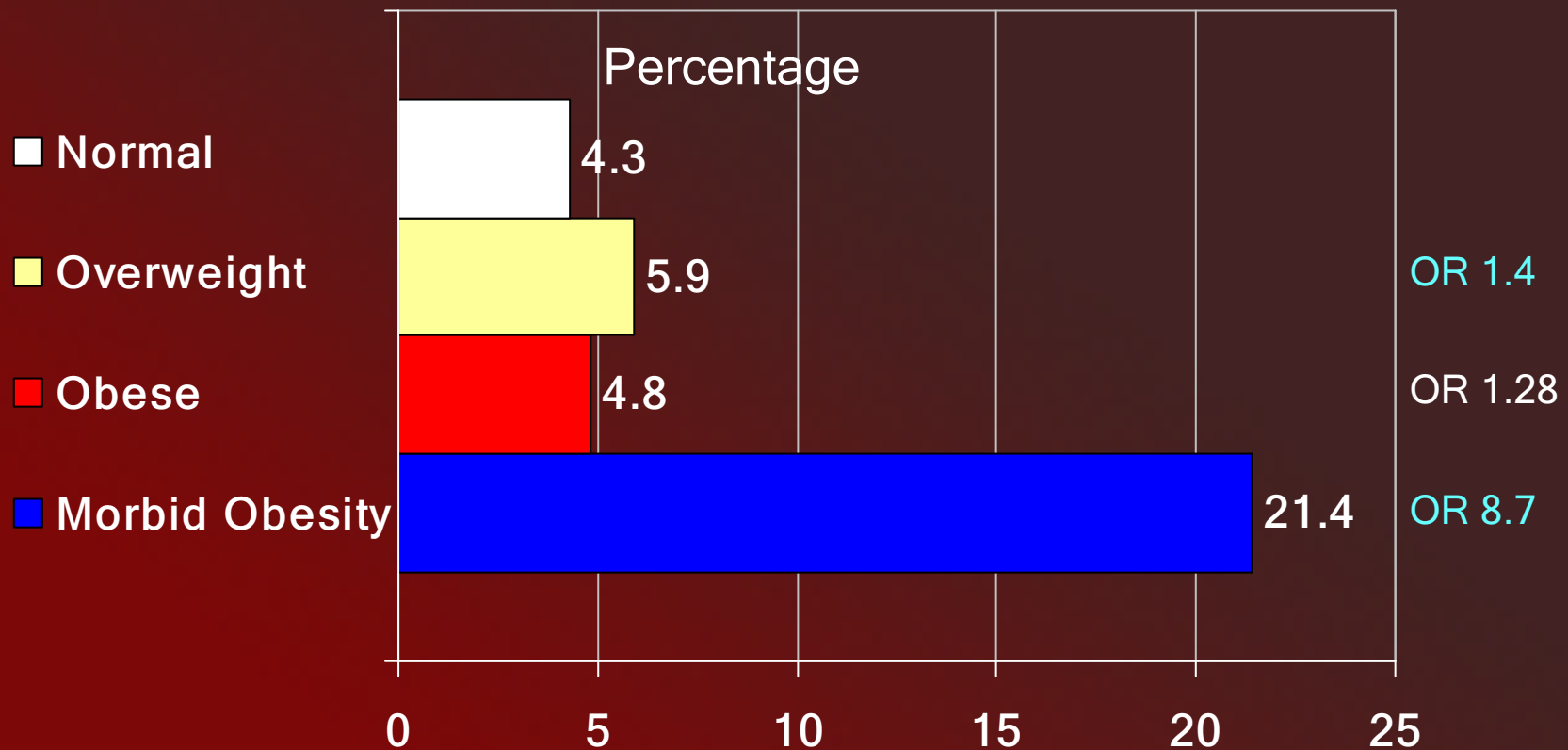
5 - 7 kg / m² increase in BMI	Risk Doubled
Waist Circumference > 80 cm at 16 weeks	OR 2.7 Pre Eclampsia

Waist circumference > 80 cm at 16 weeks,
Sattar et al, Obstet Gynecol 2001; 97: 268 -291



The trend of odds was also highly significant, p value 0.0000

Medical Disorders Severe Pre eclampsia



The trend of odds was also significant, p value 0.03

Obesity and GDM

BMI	Odds Ratio
< 25, Normal	1
25 - 29, Overweight	3.4
> 30, Obese	15.3

Obstet Gynecol, 2005; 105: 537 - 42

Diet, Obesity and Defects

- BMI > 29 + High glycemic index diet
- Increased risk of NTDs, GDM and PE
- Undetected Type II Diabetes
- Lower circulating folate levels

Am J Clin Nutr 2003; 78 : 972 - 8

Weight Gain Change in Risk of GDM

**BMI 23, gains 3 kg between pregnancy
1 unit increase in BMI**

Risk of GDM : ↑ 30 %

**Gains 6 kg : BMI now 29
(Overweight)**

Risk of GDM : ↑ 100 %

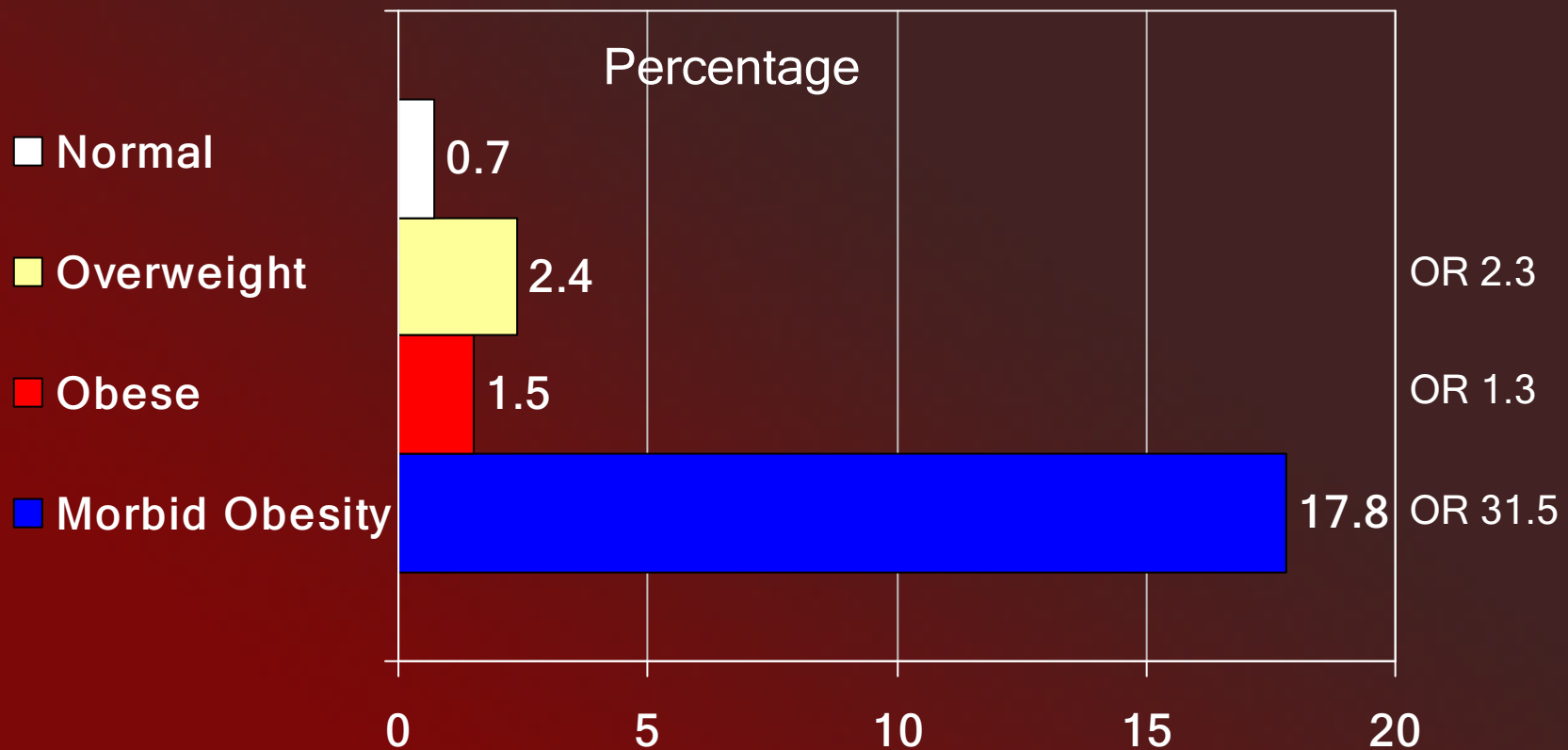
**Gains 8 kg : BMI now 31
(Obese)**

Risk of GDM : ↑ 200 %

Long Term Effects

- GDM : A major risk for Type 2 Diabetes
 - Time lag depends on ethnicity
 - Max risk in first 5 years
 - Life style interventions decrease risk

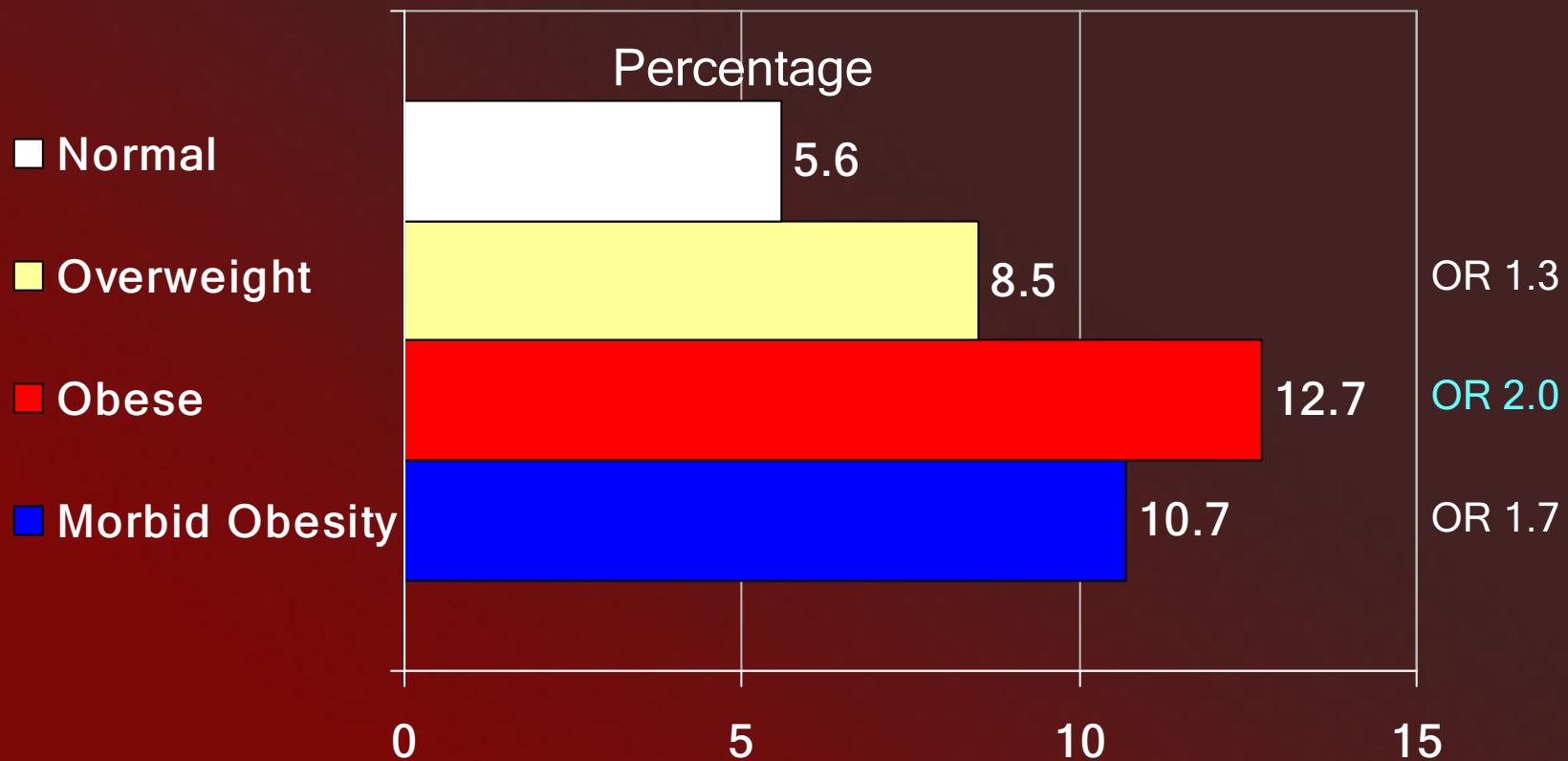
Medical Disorders Pre-Gestational Diabetes



Mantel-Haenszel ORs adjusted for age

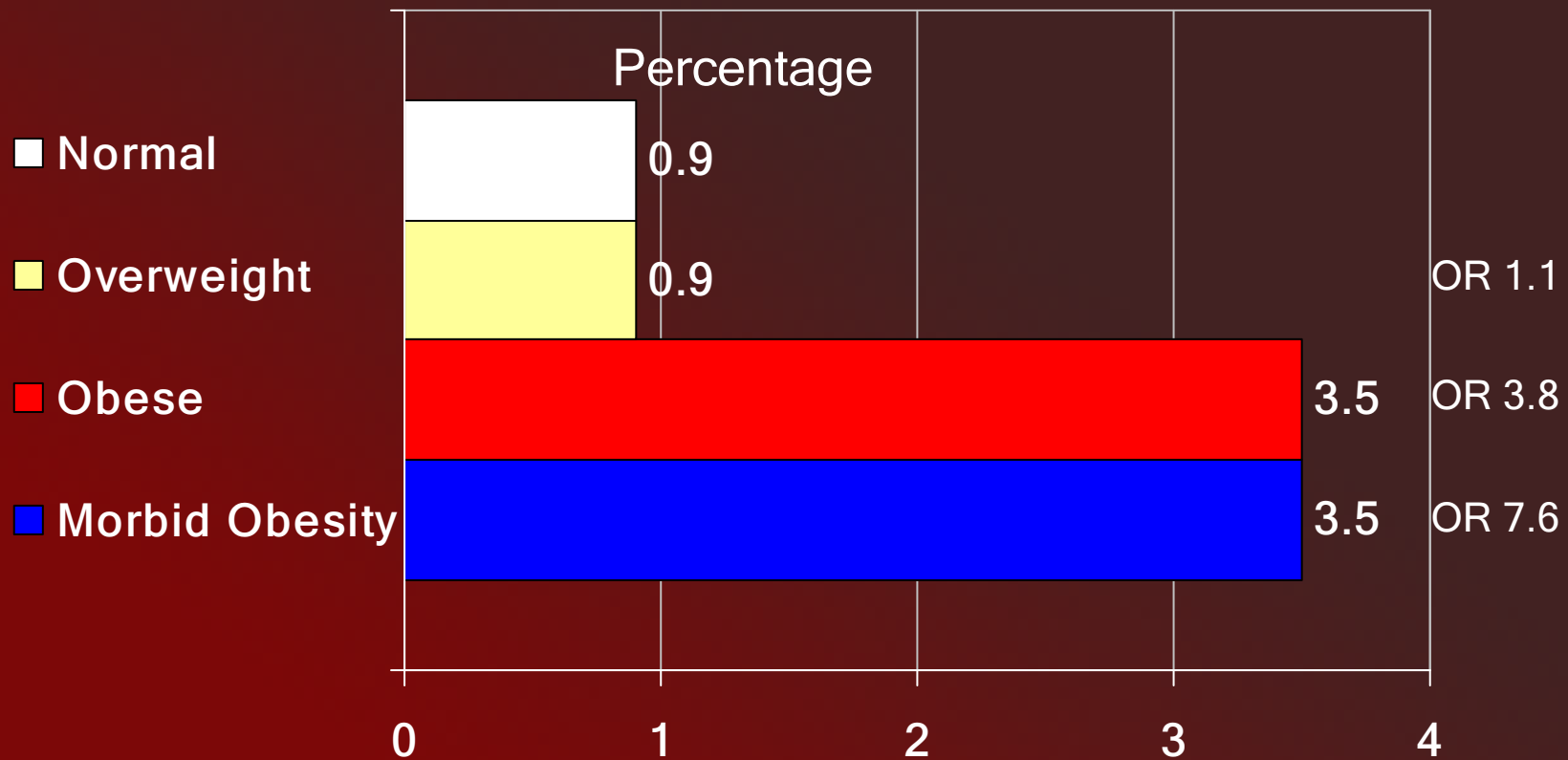
Medical Disorders

Gestational Diabetes



The trend of odds was also significant, p value 0.0001

Macrosomia, More than 4000 gm



Fishers Exact p value = 0.000

Intrapartum Risks

- Increased risk of
 - Induction of labour / fetal monitoring
 - Caesarean section
 - Failed instrumental delivery
 - Postpartum haemorrhage

BJOG 2005;112:768-72

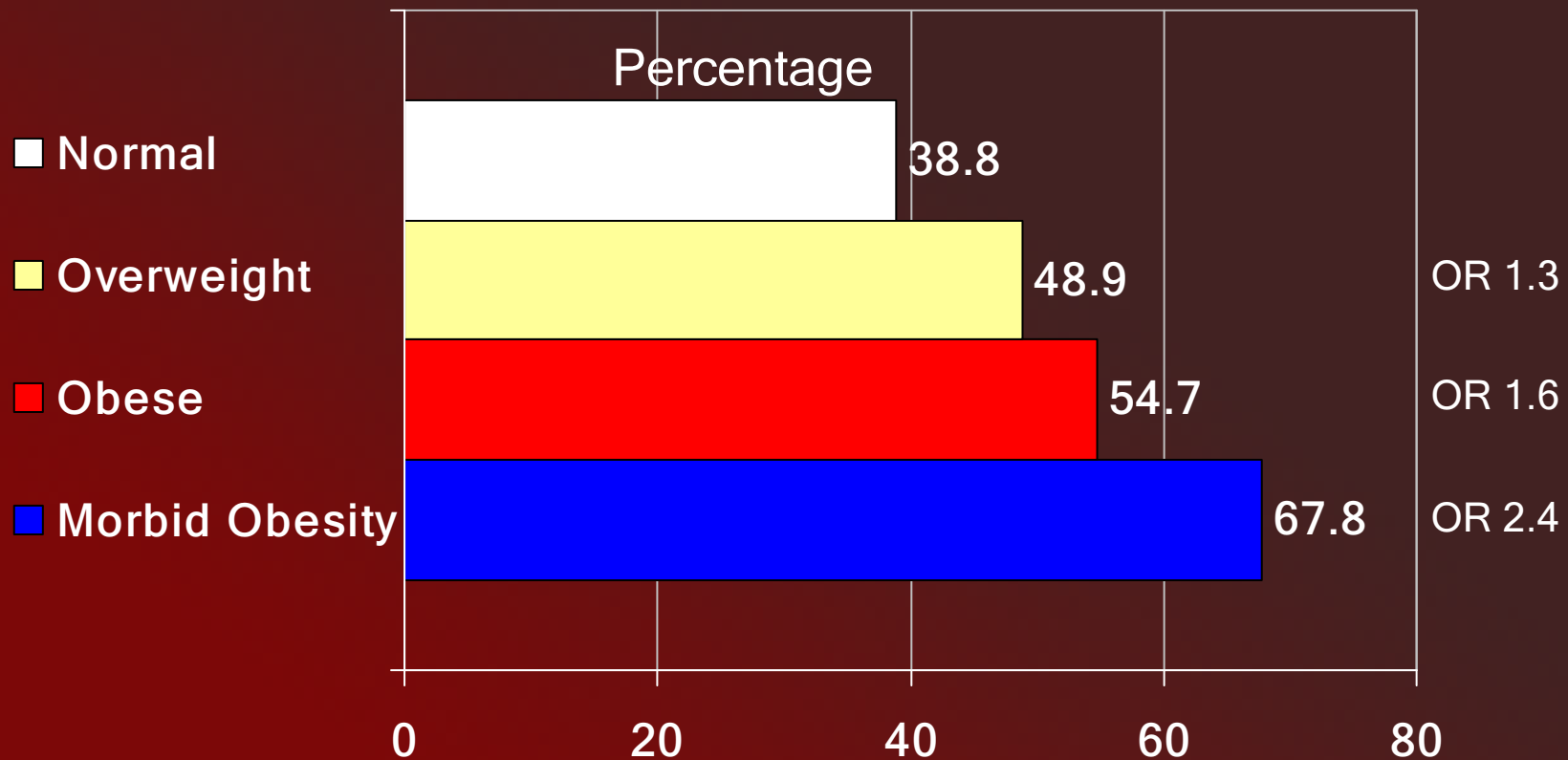
Obesity & Cesarean Section

- Increase in emergency CS
- Obese women: Two fold risk

CSR in Multiparous Obese Women

Control	Obese	Morbidly Obese
20.7%	33.8%	47.4%

Caesarean Section Rate



The trend of odds was also significant, p value, $\chi^2 = 0.0000$

Intrapartum Risks

- Decreases success of VBAC
- 50 % less successful (p value - 0.043)

*** Weight gain > 18 Kg**

Obstet Gynaecol 2005;106:741-6

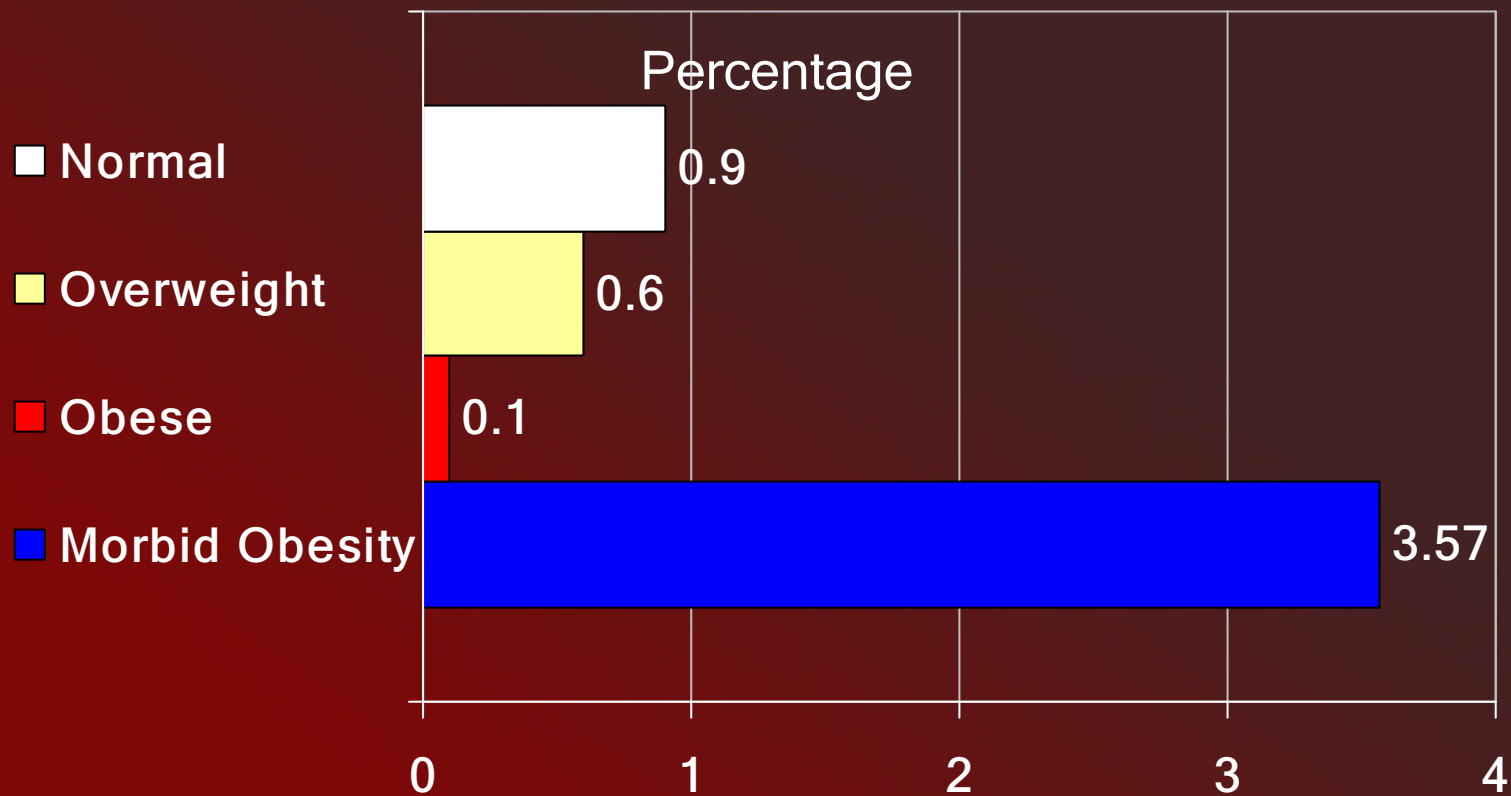
Perineal Tears

- Increased risk
- Hospital stay increased
- Danish / UK - studies

Obstet Gynaecol 2005;105:537-42

BJOG 2005;112:768-72

Obstetric Anal Sphincter Injury



Fisher's exact 0.070

Anaesthetic Risks

- Failed Regional Blocks
- Difficult Intubation
- PE and Diabetes increased risk
- Hypoxic Risks: upward shift of diaphragm

* OT Table / Trolley

Anaesthesia 2004;59:743-9

Obesity and Anesthesia

- IV access
- Intubations
- Epidural / Spinal
- HDU / ICU

*** Senior Personnel**

OT Logistics



- Gowns
- Stockings
- Beds
- OT table
- BP Cuff

Post Operative Morbidity

- Pneumonitis is common
- Thrombo-embolism

* Early ambulation

* Physiotherapy

Maternal Complications with BMI > 30

	OR
Chest Infection	1.34
Genital Tract Infection	1.30
Wound infection	2.24
Urinary Tract Infection	1.39
Pyrexia of unknown origin	1.29
Prolonged postnatal stay	1.48

Risks to Fetus and Infant

- 3 fold increase in still birth

Obstet Gynaecol 2004;103:219-24

- Late fetal deaths

- Nulliparous :
 - Doubled with normal BMI
 - Tripled with Overweight
 - Quadrupled with obese

N Eng J Med 1998;338:147-53, Epidemiology 2004; 15: 733 - 7

Comparing with CEMACH

	CEMACH	Fernandez Hospital
Incidence of Obesity	11-20%	18%
Pre eclampsia	Increased	Increased
Gestational Diabetes	Increased	Increased
Caesarean Rate	Increased	Increased
Stillbirths	Increased	Not increased

Breast Feeding

- Decreases frequency
- Latching on
- Positioning
- Decreased prolactin response

Breast feed Rev 2000; 8: 29 - 33

Pediatric 2004; 113

Lactation Failure

Formula feeds which leads to
childhood obesity

Paediatrics 2004;113:465-71

**Is obesity
during pregnancy
child abuse**

Mike Adams

www.naturalnews.com

Children of Obese Mothers

- Serious birth defects
- Kidney disease
- Heart disease
- Obesity

* Lifestyle choice

Long Term Risks

- Retain weight gain
- Increased mortality and morbidity
 - Coronary heart disease
 - Diabetes
 - HTN
 - Stroke
 - Cancers

*** Self esteem low**

What Can Be Done ?

British Fertility Society Consensus Views

53rd Study Group on Obesity and Reproductive Health

- Fertility treatment not offered if BMI > 35
- Aim for BMI of 20 - 25
- Pre Pregnancy 5 mg folic acid



News

Press Release

[home](#) > [news](#) > press release > Guidelines on the effect of obesity on female repro

British Fertility Society issues new guidelines on the effect of obesity on female reproductive health

2007, Guidelines

- Waist measurement
- Information
- Weight reduction Programme
- Defer Treatment if BMI > 35

Normal Weight Gain in Pregnancy

Inst. of Medicine

Pre Pregnancy BMI		Recommended Weight Gain (Kg)
Underweight	<18.5	12 - 18
Normal Weight	18.5 - 24.9	11 - 16
Overweight	25 - 29.9	7 - 11
Obese	> 30	5 - 9

Institute of Medicine. Weight Gain During Pregnancy: Reexamining the Guidelines. Washington, DC: The National Academies Press. May 28, 2009

Overweight / obese women
before a **FIRST** pregnancy, tend
to retain or gain more weight

Int J Obes Relat Metab Disord 2004
28: 525 – 35, Gunderson EP et al, CARDIA Study

Weight gain

before }
during } pregnancy
after }

may be a **PRIMARY** contributor
for future obesity

Obesity 2008; 16 (5) : 1078 – 84

Gunderson EP et al

Three Outcome Measures

- 1.** Average weight change (retention)
- 2.** Substantial postpartum weight retention
(> 5 kg above pregravid weight)
- 3.** Incidence of overweight / obesity after
pregnancy BMI > 26 : 1 – 2 years

Am J Epidemiol 2008 : 167:178-87

Gunderson EP et al

Gestational Weight Gain and Long-Term Weight Status

- Overweight / Obese : 2 - 6 times more likely to exceed weight gain recommendation
- Gestational weight < 15 lb in obese women may lower risk of LGA infants

Gestational Weight Gain and Long-Term Weight Status

- Excessive weight gain above recommended levels : **threefold** higher risk of becoming over weight after pregnancy

Postpartum Weight Retention

- Average weight change from preconception to first year postpartum (0.5 - 1 kg)
 - Primiparity
 - Pregravid BMI

Pregravid Weight Size and Pospartum Retention

- Strong influence
- Early (six weeks) PP loss
 - Placenta and amniotic fluid
 - Contraction of maternal blood volume
 - Loss of non-adipose tissue

Similar among all BMI groups

- Obese women **gain** weight after six weeks

Substantial Weight Retention

(> 5 kg above pregravid after one year)

- Pregravid weight
- High gestational weight gain
- Primis
- Black race
- Low socio economic status
- Smoking cessation
- < 5 hours of sleep / day

Summary

- Primiparity is associated with **higher** weight gain among women already overweight before pregnancy
- Higher postpartum weight retention seen with **high pregravid BMI**

Summary

- **Substantial** weight gain associated with childbearing is an important risk factor for development of obesity in women during midlife

Exercise Interventions for Overweight / Obese Women

- Nutrition
- Exercise - walking with pedometer

80% did NOT gain excessive weight

MoHolla et al, Med Sci Sports Exerc 2009, 2nd Ed.

Physical Activity Guidelines for Americans for HEALTHY Women

(PAGA)

150 mins - 2 hours and 30 mins
of moderate - intense aerobic activity / week

- * PARmed - X for pregnancy (prescreening)
- * FITT (principles for Frequency, Intensity, Time and Type of exercise) after prescreening

American College of Sports Medicine

Target heart rates

- 110 – 131 bpm : 20 – 29 years
- 108 – 127 bpm : 30 – 39 years

*Talk Test

Appl Physiol Nutr Metab 2008 : 33 : 984 - 9

How Can We Make Pregnancy Safe ?

- Accept as “high risk”
- Tertiary unit
- Multidisciplinary approach



FAMILY

**CALLS for
Change
at all
LEVELS**



Obesogenic Society

**CALLS for
Change
at all
LEVELS**

NOW!





**National,
Political
Will**