

Maternal and Fetal/Neonatal Complications of Obesity in Obstetrics

Resident Research

Atlantic Society of Obstetrics and Gynecology

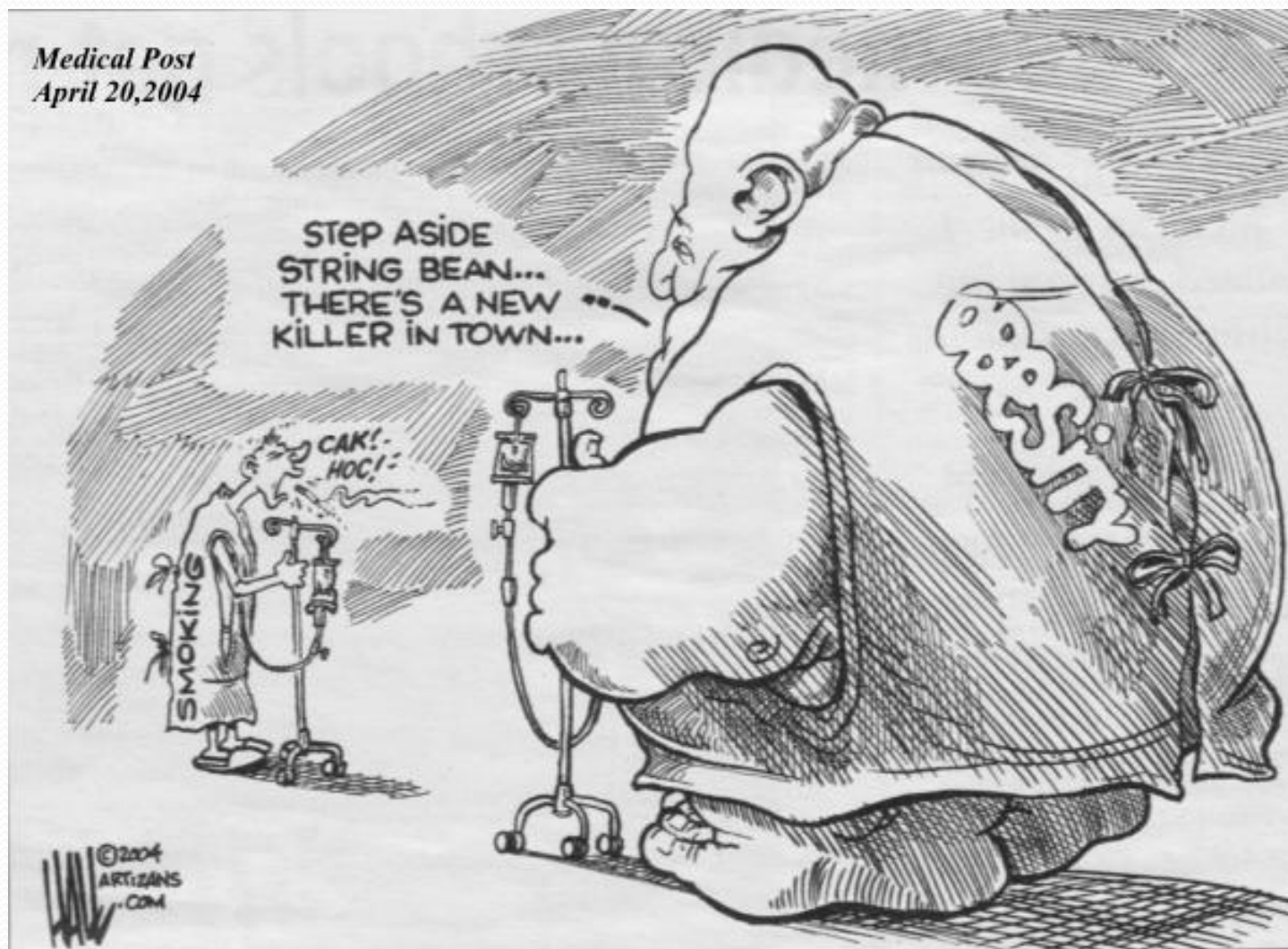
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Introduction

- Obesity an ever expanding problem....
- Multiple associations with maternal and neonatal complications of pregnancy
- Indicators suggest that percentages of overweight women in NL increasing:
 - 49.1% overweight of which 22.6% were obese*

* NLPPP

Objective

- Examine impact of prepregnant overweight and obesity on maternal and fetal outcomes in Newfoundland

Methods

- Extraction of data from Newfoundland and Labrador Provincial Perinatal Database
 - April 2001 – April 2006
 - Singletons
 - Including stillbirths
 - Residents of St. John's and surrounding area

Methods

- Data capture includes
 - Prenatal and L & D records
 - Maternal and neonatal inpatient information
 - *Admission around time of delivery*

Methods

- Retrospective cohort analysis stratified by weight classes
 - Normal weight: BMI 18.5-24.99
 - Overweight: BMI 25-29.99
 - Obese: BMI 30-39.99
 - Morbidly obese: BMI ≥ 40

Methods

- Height data in short supply! So...
 - Normal weight: 110-164 lbs
 - Overweight: 165-199 lbs
 - Obese: 200-274 lbs
 - Morbidly obese: ≥ 275 lbs

Variables Under Review

- Maternal

- Mode of delivery
- Gestational HTN
- Gestational DM
- Spont PTL
- Induction
- Augmentation
- Length of labor
- Perineal injury

- Fetal

- Birthweight
- Shoulder dystocia
- Apgars
- Need for NICU admission
- Structural anomalies
- RDS, NEC, IVH
- Mortality

Methods

- Statistical Analysis - SPSS 14.0
- Descriptive statistics
- Univariate analysis
 - Chi-squared (or Fisher's exact test) for categorical data
 - Student's t-test for continuous data
- Multivariate analysis
 - Logistic regression controlling for age, parity, smoking status, partnered status
- $p < 0.05$ considered significant

Results

- Initial pool of 9200 singleton births
 - 5769 with data to plot weight categories
- Increased weight groups – more likely:
 - Parous
 - Partnered
 - Prior C-section
 - Prior macrosomic infant
- Obese more likely to have pre-existing diabetes

Maternal Outcomes

- Overweight and obese women at increased risk of:
 - Gestational HTN
 - Gestational DM
 - Induction of labor
 - Prostaglandin use
 - Augmentation
 - OVD
 - C-section
 - Epidural usage

Maternal Outcomes (cont'd)

- Morbidly obese women and combined obese
 - Increased shoulder dystocia
- All obese women
 - LOS > 3 and > 5 days
 - Persistent when C-sections excluded

Neonatal Outcomes

- Significant increase in all weight groups:
 - Mean birth weight
 - Birthweight $\geq 4000\text{g}$
 - Birthweight $\geq 4500\text{g}$
 - Apgar < 7 at 1 min
 - Not persistent at 5 min
- Obese and combined obese
 - Higher rate of NICU admission
 - Bag and mask ventilation

Multivariate Analysis

- Controlled for age, nulliparity, smoking and partner status
- Compared to normal weight as control
- Obese groups – significantly increased rates:
 - Gestational HTN: OR 5.80 (4.59-7.33)
 - Gestational DM: OR 4.35 (3.09-6.12)
 - Induction: OR 2.43 (2.07-2.84)
 - Prostaglandin use: OR 2.92 (2.43-3.51)
 - Augmentation with oxytocin: OR 1.39 (1.17-1.66)
 - C-section: OR 2.33 (2.00-2.72)
 - Epidural use: OR 1.94 (1.64-2.19)

Multivariate Analysis

- Obese women significantly increased rates:
 - LOS* > 3 d: OR 1.83 (1.50-2.21)
 - LOS* > 5 d: OR 2.24 (1.64-3.05)
 - Birthweight $\geq 4000\text{g}$: OR 2.05 (1.71-2.45)
 - Birthweight $\geq 4500\text{g}$: OR 2.07 (1.43-2.99)
 - Apgar < 7 at 1 min: OR 1.45 (1.11-1.90)
 - Bag & mask ventilation: OR 1.51 (1.18-1.93)
 - NICU admission: OR 1.51 (1.19-1.91)

* Length of stay

Multivariate Analysis

- Similar trends seen in overweight women:
 - Gestational HTN: OR 2.57 (1.99-3.31)
 - Gestational DM: OR 1.72 (1.16-2.56)
 - Induction: OR 1.49 (1.28-1.73)
 - Augmentation: OR 1.19 (1.01-1.40)
 - C-section: OR 1.52 (1.30-1.77)
 - Epidural use: OR 1.23 (1.06-1.44)
 - Birthweight $\geq 4000\text{g}$: OR 1.51 (1.26-1.80)
 - Birthweight $\geq 4500\text{g}$: OR 1.60 (1.09-2.33)
 - NICU admission: OR 1.34 (1.06-1.69)

Discussion

- Prepregnant maternal overweight and obesity significantly contribute to a number of adverse maternal and neonatal outcomes with long-ranging implications

Discussion

- Increased maternal risks and complications:
 - Gestational HTN
 - Gestational DM
 - Induction of labor and use of prostaglandins
 - Augmentation of labor
 - Caesarean delivery
 - Epidural use
 - Shoulder dystocia
 - LOS greater than 3 and 5 days

Discussion

- Increased neonatal risks and complications:
 - Birthweight \geq 4000g and 4500g
 - NICU admission
 - Low 1 minute Apgar score
 - Need for bag and mask ventilation

Discussion

- Limitations of information
 - Raw data for prevalence of outcomes
 - Unable to qualify indications for
 - OVD, C-sections, NICU admission, LOS, inductions
 - Impact of gestational weight gain

Discussion

- Future areas of investigation
 - Ramifications of increased C-section rate
 - Antenatal admissions
 - Postpartum re-admission
 - Length of labor
 - Anesthetic complications
 - Difficulties/failure of regional anesthesia
 - Need for/difficulties with general anesthesia

Discussion

- Information to be used in counselling of patients
 - Ideally preconceptually
 - Infertility population
 - Early gestation
- Education of other health professionals
 - GPs
 - Nursing
- Public awareness
 - TV, radio, newspaper



Thanks!