GEMs
GOOD EVIDENCE MATTERS

GEMs of the Week

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What's in this week's issue?

Week of April 19 - 23, 2021

SPOTLIGHT: To lose or gain between pregnancy? That is the question.

- Empirical Anti-MRSA Therapy Does Not Reduce 30-Day Mortality Risk in Patients Hospitalized for Pneumonia

To lose or gain between pregnancy? That is the question.

Interpregnancy weight change and adverse pregnancy outcomes: a systematic review and meta-analysis

Oteng-Ntim E, Mononen S, Sawicki O, et al. Interpregnancy weight change and adverse pregnancy outcomes: a systematic review and meta-analysis. *BMJ Open*. 2018; 8(6):e018778.

KEY TAKEAWAY: Weight gain between pregnancies increases risk of cesarean section (CS), gestational diabetes mellitus (GDM), and birth too large for gestational age (LGA) infants, while lowering the risk of birth too small for gestational age (SGA) infants. Weight loss between pregnancy increases risk of birth to SGA infants and decreases risk of birth to LGA infants and GDM.

STUDY DESIGN: Systematic review and meta-analysis of 11 population-based observational cohort studies

LEVEL OF EVIDENCE: STEP 3

BRIEF BACKGROUND INFORMATION: The obesity epidemic is worsening in western countries and has an impact on many health outcomes. Some of these outcomes in pregnancy include risk of cesarean section, acquiring gestational diabetes, giving birth to large for gestational age infants, and infants with macrosomia. However, little research has been done on the effect of body mass index (BMI) change between pregnancies on adverse pregnancy outcomes.

PATIENTS: Women with singleton births

INTERVENTION: Interpregnancy weight change >3 BMI units

CONTROL: Women who remained in the same BMI +/- 2 units between pregnancies

OUTCOME: Large for gestational age, small for gestational age, macrosomia, gestational diabetes mellitus, cesarean section

METHODS (BRIEF DESCRIPTION):

- Inclusion Criteria: Women with singleton births from parity 0 to 1
- Exclusion Criteria: Women with previous diabetes diagnosis
- Substantial increase in BMI defined as >3 units BMI increase; moderate increase in BMI defined as 1–3 units BMI increase; decrease in BMI defined as >1 unit BMI decrease
    - If small number of studies for outcome, substantial and moderate increases were combined as increase in BMI
- When applicable, data divided based upon maternal BMI <25 kg/m^2 and ≥25 kg/m^2 to compare normal maternal BMI with overweight/obese maternal BMI

INTERVENTION (# IN THE GROUP): 925,065

COMPARISON (# IN THE GROUP): 925,065

FOLLOW UP PERIOD: Through the end of second gestation

RESULTS:

A substantial increase in interpregnancy BMI (>3 units increase in BMI) is associated with:

- Increased risk of LGA infants (adjusted odds ratio [aOR] 1.9; 95% CI, 1.7–2.0)
- Increased risk of GDM (aOR 2.3; 95% CI, 2.0–2.6)
- Increased risk of CS (aOR 1.7; 95% CI, 1.3–2.2)
- Increased risk of macrosomia (aOR 1.5; 95% CI, 0.94–2.5)
- Decreased risk of SGA infants (aOR 0.83; 95% CI, 0.70–0.99)

Decrease in interpregnancy BMI is associated with:

- Increased risk of SGA infants (aOR 1.3; 95% CI, 1.1–1.6)
- Decreased risk of LGA infants (aOR 0.70; 95% CI, 0.55–0.90)
- Decreased risk of GDM (aOR 0.80; 95% CI, 0.62–1.0)

LIMITATIONS:

- Heterogeneity is high, and therefore conclusions should be interpreted lightly
- Lack of generalizability of study findings as studies all conducted in high-income western countries
- Lifestyle modifications and breast feeding of mothers were confounders not accounted for in the analysis
- Outcomes such as perinatal mortality, preterm birth, pre-eclampsia were not included

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Empirical Anti-MRSA Therapy Does Not Reduce 30-Day Mortality Risk in Patients Hospitalized for Pneumonia

Empirical Anti- MRSA vs Standard Antibiotic Therapy and Risk of 30-Day Mortality in Patients Hospitalized for Pneumonia

Jones BE, Ying J, Stevens V, et al. Empirical Anti- MRSA vs Standard Antibiotic Therapy and Risk of 30-Day Mortality in Patients Hospitalized for Pneumonia: A Cohort Study. *JAMA Internal Medicine*. 2020; 180(4):552560.

KEY TAKEAWAY: Empirical anti-MRSA therapy is associated with a higher 30-day mortality compared to standard antibiotic therapy alone for patients hospitalized for pneumonia.

STUDY DESIGN: 5 year retrospective multicenter cohort study

LEVEL OF EVIDENCE: STEP 3

BRIEF BACKGROUND INFORMATION: The use of empiric broad- spectrum antibiotics to cover organisms such as MRSA in patients hospitalized for pneumonia has grown despite the lack of supporting evidence of its efficacy or reduction in 30-day mortality.

PATIENTS: Patients hospitalized with community-acquired pneumonia

INTERVENTION: Empirical anti-MRSA therapy only or anti-MRSA plus standard pneumonia therapy

CONTROL: Empirical standard therapy alone

OUTCOME: Risk of 30-day mortality

Secondary: Development of acute kidney injury and secondary infections

METHODS (BRIEF DESCRIPTION):

- 128,748 hospitalizations for pneumonia in the Veterans Health Administration healthcare system were identified
- 88,605 patients met inclusion criteria
- Patients were separated into primary exposure groups:
  - Patients receiving anti-MRSA therapy (vancomycin hydrochloride or linezolid) plus standard antibiotics (B- lactam and macrolide or tetracycline hydrochloride, or fluoroquinolone)
  - Patients receiving empirical anti-MRSA therapy only and no standard therapy
  - Patients receiving standard therapy alone
  - Note: Specific dosage, frequency, and duration of each therapy not provided

INTERVENTION (# IN THE GROUP): empirical anti-MRSA + standard antibiotics = 13,528
Empirical anti-MRSA antibiotics only = 20,104

COMPARISON (# IN THE GROUP): 54,973

FOLLOW UP PERIOD: 30 days

RESULTS:

Empirical anti-MRSA therapy was associated with a higher risk for:

- 30-day mortality (weighted adjusted risk ratio [aRR] 1.4; 95% CI, 1.3–1.5)
- Acute kidney injury (aRR 1.4; 95% CI, 1.3–1.5)
- *C. difficile* infection (aRR 1.6; 95% CI, 1.3–1.9)
- Vancomycin-resistant *Enterococcus spp* (aRR 1.6; 95% CI, 1.0–2.3)
- Secondary gram-negative rod detection (aRR 1.5; 95% CI, 1.2–1.8)

Marginal probabilities of 30-day mortality:

- Empirical anti-MRSA + standard therapy = 11.6%
- Empirical anti-MRSA + nonstandard therapy = 12.7%
- Standard therapy alone = 8.6%

LIMITATIONS:

- Decision to treat with anti-MRSA therapy may reflect higher perceived risk of infection and death, confounding results through unmeasured characteristics
- Since the study involved diagnostic codes placed at the end of hospitalization, it might include patients that were not initially diagnosed with pneumonia on admission
- 98% of the study population was men; women may have different outcomes
- 98% of anti-MRSA therapy utilized vancomycin; conclusions regarding use of linezolid are therefore limited

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