

# MATERNAL WEIGHT GAIN IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE

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## STUDY AIMS

- **Primary:** To determine the prevalence with which women with IBD are meeting the 2009 IOM guidelines for weight gain in pregnancy
- **Secondary:** To examine the association between inadequate, adequate and excessive weight gain in women with IBD and pregnancy complications
- **Tertiary/Exploratory:** To explore pregnancy outcomes according to non-BMI based nutritional parameters in women with IBD

## NUTRITION AND IBD

- Weight loss and low BMI are common in patients with Inflammatory Bowel Disease
  - IBD patients admitted to the hospital have a higher prevalence of protein-calorie malnutrition compared to non-IBD inpatients
- Poor nutritional status appears to be highly prevalent among patients with both newly diagnosed and established IBD

Kugathasan S, Nebel J, Skelton JA, et al. Body mass index in children with newly diagnosed inflammatory bowel disease: observations from two multicenter North American inception cohorts. Clin Gastroenterol Hepatol 2006; 4:1118-1123.  
 Nguyen GC1, Munsell M, Harris ML. Nationwide prevalence and prognostic significance of clinically diagnosable protein-calorie malnutrition in hospitalized inflammatory bowel disease patients. Inflamm Bowel Dis. 2008 Aug;14(8):1105-11.

## NUTRITION AND IBD

- BMI and serum albumin are the most commonly used markers for malnutrition
- BMI may not be the best indicator of nutritional status
  - Study by Mijac et al showed a discordance between BMI, percentage of ideal body weight, and the degree of micronutrient deficiencies
    - Especially iron, vitamin B6, and vitamin D
  - Suggests that even patients with IBD who appear to be well-nourished based on BMI are still at risk for vitamin and mineral deficiencies

Mijac et al. Nutritional status in patients with active inflammatory bowel disease: prevalence of malnutrition and methods for routine nutritional assessment. European Journal of Internal Medicine. 2010 Aug;21(4):315-9.

## NUTRITION IN PREGNANCY

- During pregnancy, nutritional requirements are increased
- In 2009, Institute of Medicine updated guidelines on recommended weight gain during pregnancy

Baseline Weight		Weight Gain in Pregnancy	
Ideal BMI	51.3%	Within guidelines	30.8%
Underweight	3.9%	Below guidelines	16.7%
Overweight/Obese	44.8%	Above guidelines	52.6%

Johnson et al. [Pregnancy outcomes with weight gain above or below the 2009 Institutes of Medicine Guidelines](#). *Obstetrics and Gynecology*. 2013 May;121(5):969-975.  
 Simas et al. [Impact of updated Institute of Medicine guidelines on prepregnancy body mass index categorization, gestational weight gain recommendations, and needed counseling](#). *Womens Health (Larchmt)*. 2011 Jun;20(6):837-44. doi: 10.1089/jwh.2010.2429. Epub 2011 Apr 21  
[Awanarunrat E. Outcomes of gestational weight gain outside the Institute of Medicine Guidelines](#). *J Med Assoc Thai*. 2014 Nov; 97(11):1119-25.

## PREGNANCY AND IBD

- Women with IBD are at increased risk for several adverse pregnancy outcomes
  - Low birth weight (< 5lbs 8 oz or <2500 gm)
  - Small for gestational age (SGA)
  - Pre-term birth (<37 weeks)
  - Cesarean section

Mahadevan U. *Gut* 2006;55:1198-1206  
 Dominitz JA et al. *Am J Gastroenterol* 2002;97:641-8  
 Cornish J et al. *Gut* 2006, 0:1-8.

## PREGNANCY, NUTRITION AND IBD

- Retrospective, single-center study of 75 women from Israel
  - 27% of women with UC and 33% of women with Crohn's disease did not meet IOM weight gain recommendations
  - Weight gain of less than 12 kg was associated with increased risk for adverse pregnancy outcomes
  - Limitations of study: did not use validated measure of disease activity or account for pre-pregnancy BMI

Oron et al. [Inflammatory bowel disease: risk factors for adverse pregnancy outcome and the impact of maternal weight gain](#). Journal of Maternal Fetal Neonatal Medicine. 2012 Nov;25(11):2256-60

## METHODS

### STUDY POPULATION

- Subjects enrolled in the PIANO registry at UW
  - 67 patients enrolled at UWHC (5<sup>th</sup> highest enrolling site)
- Women enrolled at any stage of pregnancy
  - Contacted every trimester, at time of delivery, and then at pre-defined time points until child reaches age 4
  - Maternal characteristics, disease characteristics, pregnancy outcomes and complications, and newborn complications are recorded
- Data extracted from PIANO registry and medical record
- Analysis
  - Descriptive statistics calculated

## RESULTS

Table 1: Subject characteristics

Characteristic	
Mean age (SD)	30.1 (3.95)
Race (N, %)	
• Caucasian	66 (94%)
• Hispanic	1 (1%)
• African American	1 (1%)
• Other	2 (3%)
IBD subtype (N, %)	
• Crohn's disease	41 (59%)
• Ulcerative colitis	26 (37%)
• Indeterminate colitis	3 (4%)
History of smoking (N, %)	18 (26%)
Disease activity during pregnancy (N in remission, %)	35 (85%)
• Crohn's disease (HBI)	21 (81%)
• UC (SCCAI)	
Disease duration (mean years, SD)	7.5 (6.9)

## RESULTS

Table 2: Pre-pregnancy BMI

BMI	Study population	General population
Ideal	43 (61%)	51.3%
Underweight	4 (6%)	3.9%
Overweight/ Obese	23 (32%)	44.8%

## RESULTS

Table 3: Nutritional parameters in pregnancy

Parameter	N (%)
Albumin, abnormal	10/32 (31%)
Vitamin D, abnormal	11/34 (32%)
Vitamin B12, abnormal	6/20 (30%)
Folate, abnormal	6/33 (18%)
Iron, abnormal	5/18 (28%)
TIBC, abnormal	3/18 (17%)
Ferritin, abnormal	6/19 (32%)

## RESULTS

Table 4: Weight Gain in Pregnancy

Parameter	Mean (SD)
Total weight gained (lbs)	
• Mean (SD)	30.5 (13.3)
• Range	-10 to +70

  

	Study Population (n=63)	General Population
Ideal	19 (30%)	30.8%
Below Guidelines	17 (27%)	16.7%
Above Guidelines	27 (43%)	52.6%

## RESULTS

■ Table 5: Pregnancy Outcomes

Outcome	N (%)
Pre-term birth	4 (6%)
Low birth weight	2 (3%)
Cesarean section	30 (43%)
Pregnancy complication*	32 (46%)

\* Includes infection, gestational diabetes, pre-eclampsia, bleeding, assisted deliveries

## RESULTS

■ Table 6: Weight Specific Pregnancy Complication Rates

Weight gain based on guidelines	Total (n=63)
Ideal	6 (8%)
Below guidelines	11 (15%)
Above guidelines	15 (21%)

## DISCUSSION

- Overall, in this cohort of patients with inflammatory bowel disease, pregnancy appears to be reasonably safe and without a disproportionate rate of complications
  - >80% of the study population was in remission throughout pregnancy
  - Pre-pregnancy BMI was largely within ideal range and degree of weight gain was similar to the general population.
- Nutritional deficiencies appear to be fairly common in this cohort despite the fact that most patients were not underweight by BMI at the start of pregnancy
- Weight gain outside of guidelines (above & below) appears to be associated with a slightly higher rate of pregnancy complications

## FUTURE DIRECTIONS

- Women with IBD and documented pregnancies not enrolled in PIANO have been identified by a heat ticket query (n=65)
  - Data regarding disease location, activity, pre-pregnancy BMI & weight gain, and nutritional parameters will be extracted from the chart
- Stepwise linear regression will be performed to evaluate the association between maternal weight gain and pregnancy complications in the entire cohort
- We will further examine nutritional parameters to identify the prevalence of nutritional deficiencies in this population and association with abnormal weight gain and/or pregnancy complications



## REFERENCES

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