Describing a United States Appalachian bariatric surgery patient population

Makenzie Barr1, Melissa Olfert1, Lawrence Tabone2, Nova Szoka2, Cassie Brode3, Stephanie Cox3, Laura Davission3
1Davis College of Agriculture, Natural Resources, and Design, West Virginia University, Morgantown, United States; 2School of Medicine, West Virginia University, Morgantown, United States

Abstract
Background: Limited data exist on those who receive bariatric and metabolic surgery in a rural population such as Appalachian America. Objectives: Characterize an Appalachian bariatric and metabolic surgery population seeking care within a large, academic tertiary medical center. Methods: A retrospective electronic medical record (EMR) data extraction was performed on 569 patients who underwent bariatric and metabolic surgery at an academic medical center in West Virginia between 2013-2017. Researchers extracted demographics, health and family medical history, nutrition/dietary habits, psychological questionnaire scores, and anthropometric data from EMRs. Data were then entered into a HIPAA compliant survey database. Results: The sample was predominately female (79.1%), Caucasian (92.1%), mostly West Virginia residents (73.1%), with commercial insurance (n=153). Nearly 37% received a high school diploma or less, over 60% were married, and over 70% received Roux-en-Y gastric bypass surgery. Average preoperative weight of patients was 299.2±62.8 pounds (n=585) with a BMI of 48.3±1.1 kg/m² (n=584); preoperative EBW was 144.5±53.4 pounds (n=585). Most common medical comorbidities in this population included prediabetes (n=207, 35.2%), Type 2 diabetes (n=188, 32%), sleep apnea (n=242, 41.2%), high blood pressure (n=338, 55.4%), high cholesterol (n=222, 37.6%), gastroesophageal reflux disease (n=170, 28.9%), clinical depression (n=267, 45.4%), and diagnosed clinical anxiety or panic disorder (n=169, 29.7%). Validated psychological questionnaires identified the following: average Beck Depression Inventory scores were 10.1±8.6, and Beck Anxiety Inventory scores were 6.1±4.8, falling within normal limits. Average scores on a measure of binge eating, Gormally Bingo Eating scale (11.8±7.7), were within normal limits, along with scores on AUDIT-C (3.7±9.3), an alcohol screening measure. Dietary behaviors prevalent in this population included highest percentages of eating in front of the TV, rarely keeping meals, eating 2-3 times per day, a meal duration between 5-15 minutes (i.e., rapid eating), and eating in response to emotions 2-4 times per week. Conclusions: The current descriptive data underscore the importance of identifying factors that are salient and unique to an Appalachian population in order to improve and inform future lifestyle interventions.

Methods
- Researcher Meetings
  - Data extraction training
  - Chart Reviews
  - Questionnaires
  - Provider notes

Follow-up
- Over 20 researchers and medical professionals at WVU
  - Multi-disciplinary research intervention to determine nutritional behaviors, lifestyle behaviors, psychological determinants, and health history to define a population of individuals with health problems known to be worse than most of the surrounding United States
  - Researchers were trained on data extraction from Electronic Medical Records
  - All pertinent health information and behaviors entered into a patients medical chart will be entered into a secure survey for data analysis
  - Total 2013-2017 patient population
    - n=673
  - Over 600 data points per patient chart
    - Demographics, nutrition questionnaire, health history, psychological questionnaires (Beck’s Anxiety Inventory, Beck’s Depression Inventory, AUDIT-C, Gormally Bingo Eating, Three Factor Eating, and Brief COPE), and lifestyle behaviors.
  - Repeated anthropometric measures
    - Weight, BMI, EBW, %EWL, Blood pressure, labs

Results

<table>
<thead>
<tr>
<th>Baseline</th>
<th>n=547</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>38.2 (11.7)</td>
</tr>
<tr>
<td>Gender</td>
<td>Female 55.6%</td>
</tr>
<tr>
<td>Race</td>
<td>Caucasian 92.5%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>White 79.3%</td>
</tr>
<tr>
<td>BMI</td>
<td>45.2 (11.1)</td>
</tr>
<tr>
<td>Weight</td>
<td>454.1 (98.5)</td>
</tr>
<tr>
<td>Duration</td>
<td>11.1 yrs old</td>
</tr>
<tr>
<td>Medical Comorbidities</td>
<td></td>
</tr>
</tbody>
</table>
  - 31.8% Diabetes
  - 75.8% Bypass
  - 47.3% Chart Listed Depression

Collaborations
Researchers from West Virginia University and WVU Hospitals WVU Medicine are in collaboration for the completion of this project.
Areas of disciplines include:
- Davis College of Agriculture, Natural Resources, and Design
- WVU School of Medicine Exercise Physiology
- WVU Hospital Bariatric Surgery Clinic
- WVU Medicine Chestnut Ridge Center

Objective
- Research is lacking in the Appalachian region amongst bariatric surgery patients
- Preliminary EMR data will inform a future study on a lifestyle behavior change intervention among bariatric surgery patients in this Appalachian area
- Foremost, understanding the population demographic and characteristics as well as the need for an intervention

Background
Health issues in the Appalachian region are more prominent than other areas of the United States. Issues such as diabetes, depression, and especially obesity. Specifically, morbid obesity plays a large role with influencing other comorbidities.

Little work has been done in the Appalachian bariatric population. Due to the large realm of comorbidities that are associated with obesity, the Appalachian region is a prime area for research among bariatric surgery populations.