Relationship between Obesity and IDD in an Ohio Telepsychiatry Clinic: A Retrospective Review

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Introduction

- Prevalence of overweight and obesity (OW/OB) are increasing
  - Obese adults in United States in 2020 – 41.9%[1]
  - Obesity in Ohio – 37.8% [2]
  - Intellectual/developmental disability (IDD), autism spectrum disorder (ASD) and overweight/obesity (OW/OB):
    - Often co-occurring[3] with complex medical and psychiatric histories
    - Important consideration in IDD psychiatric care[3]
- Study population: patients of the Ohio Telepsychiatry Project
  - Adult patients with varying severities of IDD
    - Various co-occurring psychiatric conditions, medications, socioeconomic status, geographic factors, living environments
- Aims of study:
  - Primary – estimate prevalence of OW/OB in study population
  - Secondary – identify factors associated with overweight, obesity
- Research motivations:
  - Improve understanding of comorbidities in OW/OB, IDD, ASD
  - Identify high-risk sub-groups
  - Better equip psychiatrists to prevent, target, and treat OW/OB sequelae in IDD patients

Methods and Materials

- Retrospective chart review
  - 605 patient charts through the Ohio Telepsychiatry Project/Access Ohio
- Inclusion criteria: age 18 years old or older, diagnosis of IDD or ASD, seen at least once by a psychiatric provider in 2021
- No exclusion criteria
- IDD and ASD diagnoses stratified by severity/ICD-10 code
- Data collected/managed in REDCap (Research Electronic Data Capture)
  - Used extracted data as variables for analyses, including:
  - Presence of IDD and/or ASD diagnoses
    - BMI, comorbid conditions and genetic disorders by ICD-10 category (neurological, gastrointestinal, etc.)
  - Current prescription medications categorized by drug class
  - Sex assigned at birth
- Primary analysis (est. and incl. 95% CI using continuity correction)
  - Prevalence of BMI in four intervals: OW, OB I/II/III
    - OW (overweight) $25 \leq BMI < 30$
    - OB I (obesity class I) $30 \leq BMI < 35$
    - OB II (obesity class II) $35 \leq BMI < 40$
    - OB III (obesity class III) $BMI \geq 40$
  - Prevalence of OW, OB I/II/III by IDD severity in 6 categories
- Secondary analysis
  - Estimated the adjusted/unadjusted odd ratios, 95% CI
  - Tested associations between each predictor and outcome (OW+ and OB)
  - Adjusted models: age, sex
- Also analyzed age as possible modifier in IDD, OW/OB association

Results

- Study population: 64.1% with IDD only
  - 11.4% had ASD only, 24.1% had both IDD and ASD
- Most IDD patients graded mild (31.8%) to moderate (28.4%) category
- Respiratory, cardiovascular, and endocrine comorbidities: ↑ as obesity ↑
- 96% of patients: 1 or more comorbid psychiatric diagnoses
  - **Most treated with second-generation antipsychotics (66.3%) or antidepressants (80.3%)**
- Study cohort = 78.4% (74.0, 82.2) overweight, 52.4% (47.5, 57.3) obese
  - Average BMI 31.7 kg/m2 (obese class I)
- **Primary Aim**:
  - **Significant inverse relationship (p<0.001) where obesity decreases with increasing IDD severity**
  - **Dose-response relationship (more severe IDD, lower odds)**
- **Secondary Aims**:
  - Odds of obesity = greatest in ASD alone (AOR 2.29, p .028) vs. IDD or both
  - Comorbidities with significantly ↓ odds of obesity
    - Digestive (AOR 0.56), genetic (AOR 0.46), and neurological comorbidities (AOR 0.54) incl. seizure disorders (AOR 0.38)
  - Cardiovascular comorbidities (AOR 1.84) significantly ↑ odds of OB
  - **Patients taking antidepressants = significantly increased odds (double) of obesity (AOR 2.03)**
- IDD severity × age interaction not significant for OW or OB

Table 1. Prevalence of overweight+ (BMI ≥ 25 kg/m²), obese+ (BMI ≥ 30 kg/m²), and obesity class II+ (BMI ≥ 35 kg/m²) by IDD severity.

IDD Severity	N	Overweight+ % (95% CI)	Obese+ % (95% CI)	Obese Class II+ % (95% CI)
None	47	83.0 (69.3, 91.3)	63.8 (49.1, 76.3)	27.7 (16.7, 42.2)
Other/Unspecified	38	81.6 (65.9, 91.0)	52.6 (36.8, 67.9)	42.1 (27.5, 58.3)
Mild	131	82.4 (74.9, 88.1)	61.1 (52.4, 69.1)	38.9 (30.9, 47.6)
Moderate	117	79.5 (71.1, 85.9)	49.6 (40.5, 58.7)	28.2 (20.7, 37.1)
Severe	61	72.1 (59.5, 82.0)	44.3 (32.3, 57.0)	11.5 (5.5, 22.3)
Profound	18	44.4 (23.8, 67.2)	5.6 (0.8, 31.2)	5.6 (0.8, 31.2)

Discussion

- Results support hypothesis: study pop. ↑ OB prevalence vs. OH/USA
  - 52.4% prevalence of OB in study pop. of 412 participants w/ IDD and/or ASD
- Secondary findings:
  - Significant inverse relationship between OB severity and IDD severity
  - Variable distribution of patients of differing IDD severity, age, and living environments prompts exploration of these variables as potential modifiers
    - Living environment may influence diet, activity level, access to care, and adherence to treatment
    - More severe IDD may mean higher level/more specialized care, perhaps less independence regarding food choices
  - Odds of OB greatest in ASD alone vs. IDD or both
  - OB and antidepressants: literature reinforces finding that OB may ↑ risk of developing depression and vice versa[5]
- Limitations:
  - Study cohort race/ethnicity either unknown or mostly white
  - Unreliability of BMI accuracy given telepsychiatry setting
    - BMI = questioned as indicator of health in broad terms, also evidence IDD patients have unique anthropometry vs non-IDD[6]
  - Zip codes an insufficient proxy for socioeconomic status and future study must consider housing type (independent, group home, etc.)
- Future directions:
  - Age as modifier, place of living as mediator in IDD vs. OB
  - Explore high prevalence of antidepressant, antipsychotic use in IDD patients

Conclusions

- Consider extrapolating these trends to other rural, underserved communities
- Study supports antidepressant use increases odds of OW/OB
  - Future studies to evaluate whether this is causal or correlational
- Inverse relationship between OW/OB prevalence and IDD severity
  - Further research to examine caretaking, independent function, physical activity, diet and mobility factors
- Higher OW/OB prevalence in ASD alone vs. IDD or IDD/ASD
  - Signal to monitor, call to action for early screening and awareness

The odds of obesity decrease with increasing IDD severity, while antidepressant use doubles odds of obesity.

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