

FOOD INSECURITY AND HYPOGLYCEMIA AMONG SAFETY NET PATIENTS WITH DIABETES

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Introduction

- More than 14% of Americans are food insecure, or at risk of going hungry because of an inability to afford food. The average food insecure household experiences 7 episodes of food scarcity annually.
- Among patients with diabetes, control of blood sugar levels within a tight range requires a careful balancing of dietary intake and medication use.
- Hypoglycemia leads to traumatic accidents and reduced quality of life. It is one of the most common adverse drug events leading to ER visits.
- Cyclic availability of food in food insecure households may cause fluctuations in blood sugar levels among patients with diabetes.

Specific Aim

Determine whether food insecurity is associated with severe hypoglycemic episodes

Methods

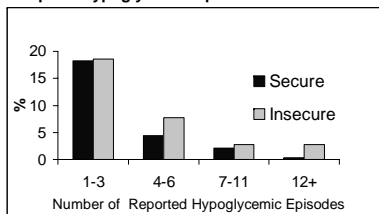
- **Sample:** Convenience sample of patients with diabetes (n=711) receiving care in safety-net clinics
- **Design:** Cross-sectional survey
- **Independent variable:** Food Security Survey Module, 6 item scale (cut size of meals, hunger, etc. *because there wasn't enough money for food*)
- **Dependent variable:** Number of severe hypoglycemic episodes ("passing out or needing help to treat the reaction")—0, 1-3, 4-6, 7-11, or 12+
- **Analysis:** Logistic regression controlling for sociodemographic characteristics and risk factors for hypoglycemia (age, insulin, renal disease, alcohol abuse, medication and glucose monitoring adherence, comorbid illnesses, hypoglycemia knowledge)

Results

Baseline Characteristics

| | Food Insecure (45.7%, n=325) | Food Secure (54.3%, n=386) | p-value |
|----------------------------|------------------------------|----------------------------|---------|
| Age, mean | 52.5 | 56.2 | <0.001 |
| Female, % | 51.4 | 49.2 | 0.6 |
| Race, % | | | 0.03 |
| Latino | 57.5 | 55.7 | |
| African-American | 24.3 | 31.6 | |
| White | 18.2 | 12.7 | |
| Education, % | | | 0.1 |
| <High school degree | 46.5 | 39.1 | |
| High school degree | 27.4 | 33.9 | |
| > High school degree | 26.5 | 26.9 | |
| Annual household income, % | | | <0.001 |
| <\$10,000 | 41.4 | 27.2 | |
| \$10,000-\$14,999 | 39.2 | 43.0 | |
| \$15,000-\$24,999 | 12.0 | 24.6 | |
| \$25,000-\$99,999 | 7.4 | 5.2 | |

Food Insecure Participants Report More Frequent Hypoglycemic Episodes



Odds of Severe Hypoglycemia by Food Security Status

| | | | Unadjusted | | Adjusted* | |
|---|------------------|----------------|---------------------|---------|---------------------|---------|
| | Food Insecure, % | Food Secure, % | OR (95% CI) | p-value | OR (95% CI) | p-value |
| Severe hypoglycemic episodes in last year | | | | | | |
| 0 | 68.9 | 75.1 | 0.73 (0.53-1.02) | 0.07 | 0.80 (0.55-1.17) | 0.2 |
| 1-3 | 18.5 | 18.1 | 1.02 (0.70-1.50) | 0.9 | 0.90 (0.59-1.38) | 0.5 |
| 4+ | 12.6 | 6.7 | 2.00 (1.19-3.35) | 0.008 | 2.12 (1.15-3.91) | 0.02 |
| Among those with a severe hypoglycemic episode (n=197), attributes hypoglycemia to the inability to afford food | | | | | | |
| | 43.2 | 6.8 | 10.4 (4.45-24.6) | <0.001 | 19.2 (5.51-66.8) | <0.001 |

* Adjusted model includes as covariates age, race/ethnicity, tobacco use, English proficiency, income, educational attainment, body weight, insulin, renal disease, adherence to medication and blood glucose testing, comorbid conditions, hypoglycemia knowledge, and alcohol abuse.

Better Glycemic Control Does Not Explain Increased Risk of Frequent Hypoglycemia Among Food Insecure

| | Food Insecure | Food Secure | p-value |
|-------------|---------------|-------------|---------|
| HbA1c, mean | 8.5% | 8.1% | 0.007 |

Limitations

- Unable to confirm self-reported episodes of severe hypoglycemia.
- Results may not be generalizable to settings outside of safety net.
- Unable to determine causality from cross-sectional study.

Conclusions

• Almost half of patients with diabetes seeking care in urban, safety-net clinics are food insecure.

• Food insecurity is an independent risk factor for frequent and severe hypoglycemic episodes.

Implications

• Food insecurity is an important patient safety issue among patients with diabetes.

• To reduce socioeconomic disparities in diabetes complications, clinicians should assist food insecure patients with frequent hypoglycemic episodes to obtain reliable access to food, rather than relax glycemic targets.

• Interventions implemented in low-income communities to improve glycemic control should include:

- self-management education regarding appropriate medication reduction during food scarcity.
- emphasis on diabetes medications with shorter half-lives (thus decreased hypoglycemia risk).



Center for Vulnerable Populations

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This poster is available at the Diabetes Information Resource Center (DIRC), www.caldiabetes.org