SOUTHERN ILLINOIS UNIVERSITY EDWARDSVILLE

SCHOOL OF PHARMACY

Evaluation of the Effects of GIP/GLP-1 and GLP-1 Agonist Shortage on Patient Outcomes in Type 2 Diabetes Mellitus

Mallory Knolhoff, PharmD Candidate[1] & Sydnie Twillmann, PharmD[1,2]

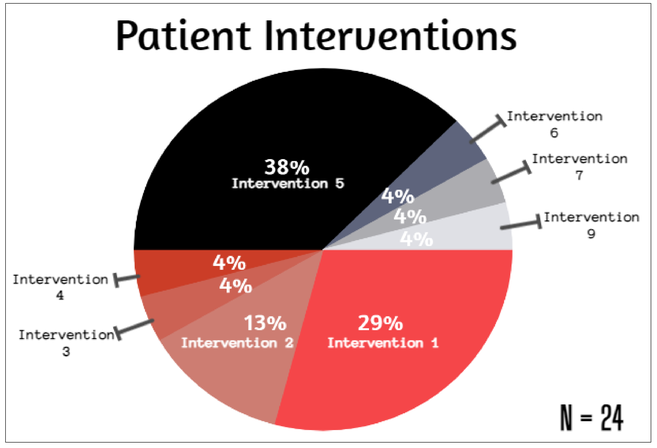
1. Southern Illinois University Edwardsville 2. HSHS Medical Group

BACKGROUND

- Glucagon-like peptide 1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP) are both insulin-dependent targets for treatment of type 2 diabetes.
- Studies show agonism of such targets reduces hemoglobin A1c in addition to cardiovascular risk and increased reno-protective properties.
- Newer research has proposed weight benefit.
- A shortage of this group of medications began in March 2022 due to increased use for cardiorenal or weight effects and misuse via improper prescribing.[1]

RESULTS

- Most patients were initially on dulaglutide (58%)
- Most patients received medication from a retail setting (n = 71%)



METHODS

- **Design:** Retrospective chart review of patients seen by pharmacists in four family medicine clinics
- **Primary Outcome:** Change in hemoglobin A1c
  - **Inclusion Criteria**
    - 18-89 years of age
    - Diagnosis of type 2 diabetes
    - On a GLP-1 or GIP/GLP-1 from 4/1/22 to 8/31/23
    - Documented "shortage" or "supply issue"
    - HbA1c before shortage and 3-6 months after
  - **Exclusion Criteria**
    - Diagnosis of type 1 diabetes
    - Pregnancy
    - Lack of prescribed GIP/GLP-1 or GLP-1 agent
- **Statistical Analysis:** Performed using SPSS 28.0 (IBM Corp., Armonk, NY)

Intervention	Type of Intervention
1	Switch to a different once-weekly GLP-1 or GIP/GLP-1
2	Switch to a different daily GLP-1 injection
3	Switch to oral GLP-1
4	Dose increase of current GLP-1 or GIP/GLP-1
5	Dose decrease of current GLP-1 or GIP/GLP-1
6	GLP-1 or GIP/GLP-1 held and current medications including insulin titrated
7	GLP-1 or GIP/GLP-1 held and current medications excluding insulin titrated
8	GLP-1 or GIP/GLP-1 held and addition of non-insulin medication
9	GLP-1 or GIP/GLP-1 held and addition of insulin medication

Diabetes Outcome		
	Patients (N)	Percent (%)
A1c Improvement	13	54.2
A1c Worsening	11	45.8

	1st A1c	2nd A1c
Mean ± SD	7.767±1.26	7.742±1.43
Two-sided p-value	0.921	

Diabetes Outcome	Numerical Intervention	
	1	2-9
	Number of Patients (N)	
A1c Improvement	1	12
A1c Worsening	6	5
One-sided p-value	0.012	

CONCLUSION

- **Limitations:**
  - No dose acknowledgement/guidelines
  - Variability in drawing of A1c level
  - Confounding variables (e.g. change in eating habits, exercise, etc.)
  - Small sample size, human error
- **Conclusions**:
  - Around half of the patients who were affected by the shortage/supply issue did see a worsening in their HbA1c despite lack of significance. However, those who underwent intervention 1 were significantly more likely to experience worsening of their HbA1c.

References

1. Current and Resolved Drug Shortages and Discontinuations Reported to FDA. FDA Drug Shortages. March 31, 2022.