



# Too Much of a Good Thing

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## Introduction

Syncope is a common presenting symptom for a wide range of illnesses. This case illustrates an unusual scenario that clinicians will likely encounter more frequently in the future.

## Case

### History

A 72-year-old man with type 2 diabetes, chronic lower extremity edema presented with a fall after using then standing from the toilet. The patient has been dizzy on standing for three weeks, with associated nausea, constipation and decreased oral intake over the three days.

A year prior the patient was started on empagliflozin, then six months later semaglutide was added on. Since then, the patient lost nearly 30 pounds with an associated A1C reduction from 8.3% to 6.3%.

### Physical

T 96.9 F, Pulse 64, RR 16

Blood pressure:

0 min lying: 219/58, HR 80

5 min standing: 78/58, HR 86

10 min standing: 89/46, HR 102

GEN: NAD, lying on bed, conversational.

HEENT: Dry mucous membranes

CV: NRR no MMG

Lungs: CTAB. Moving air comfortably and appropriately.

Abdo: Soft, nontender, nondistended.

Neuro: Strength intact no focal deficits noted

### Labs and Imaging

CBC shows mild leukocytosis

BMP bicarbonate 16, anion gap 29, glucose 133

VBG pH 7.32

UA 4+ ketonuria, negative serum ketones

EKG, telemetry, CT head, CXR all unremarkable

## Diagnosis

Given the anion gap metabolic acidosis, 4+ ketonuria, and a normal serum glucose in the setting of T2DM this is most concerning for euglycemic DKA

## Learning Point 1

Differential:

- 1) Starvation ketoacidosis (SKA)
- 2) Alcoholic ketoacidosis (AKA)
- 3) SGLT-2 inhibitor induced ketoacidosis<sup>1</sup>.

This patient had a combination of SKA and SGLT-2i induced ketoacidosis. The GLP-1a created a carbohydrate deficiency (figure 1) and SGLT-2i precipitated ketoacidosis through renal glucose loss (figure 2)

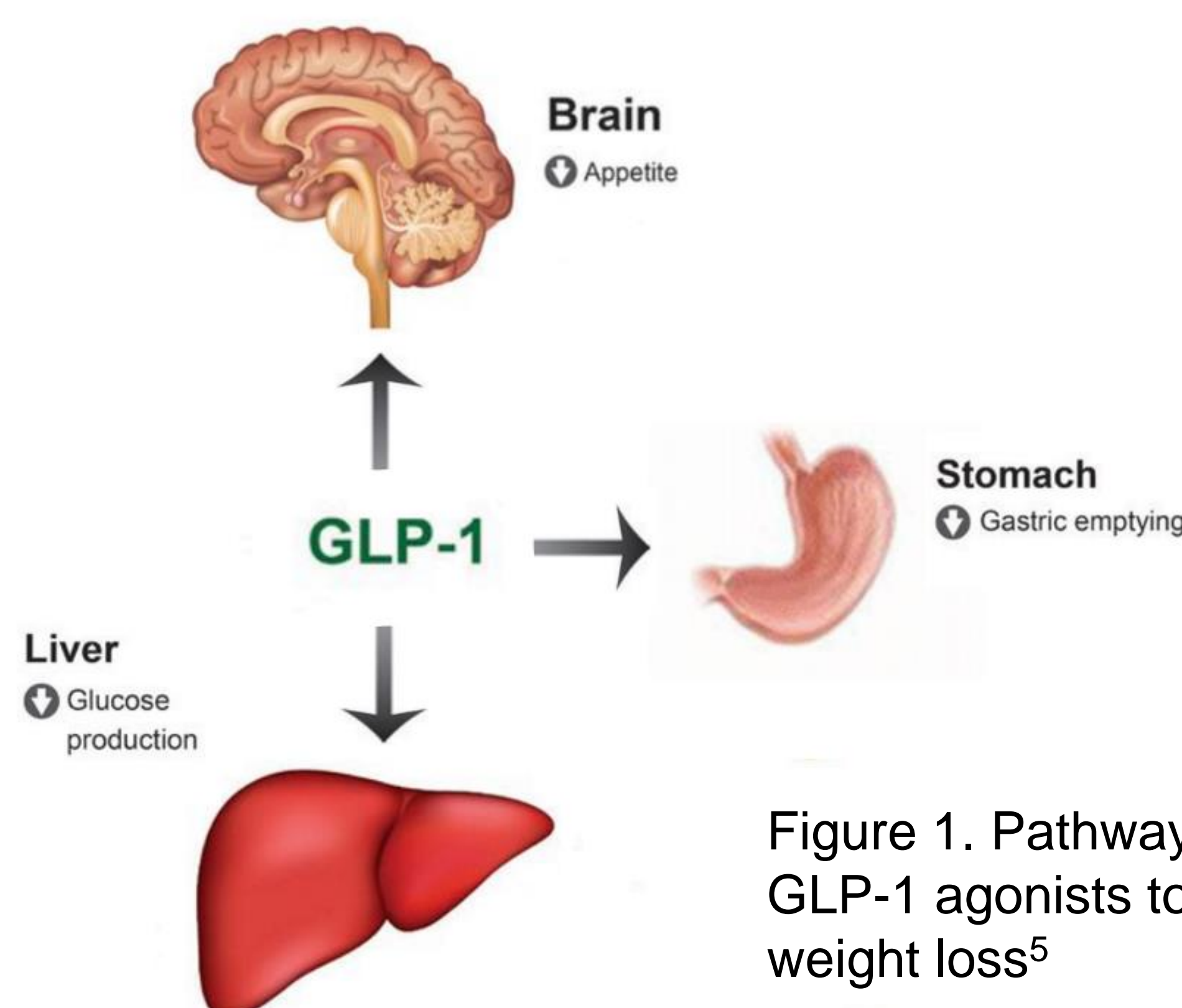


Figure 1. Pathways for GLP-1 agonists to cause weight loss<sup>5</sup>

## Learning Point 3

Fluid resuscitation is the cornerstone of treatment for euglycemic DKA regardless of etiology. Consider insulin administration carefully to prevent hypoglycemia<sup>4</sup>. SGLT-2i's increase risk of DKA in type 2 diabetics by 7 fold<sup>2</sup>

## Conclusion

- a) SGLT-2 inhibitors and GLP-1 agonists are newer medications increasing in popularity and accessibility
- b) Providers must carefully consider their unique side-effect profiles.
- c) Volume resuscitation is the cornerstone of euglycemic DKA treatment.

## Learning Point 2

The diuretic effect of SGLT2-i's are significant and are synergistic with loop diuretics which caused a severe dehydration in this patient<sup>3</sup>. Figure 2 illustrates this effect.

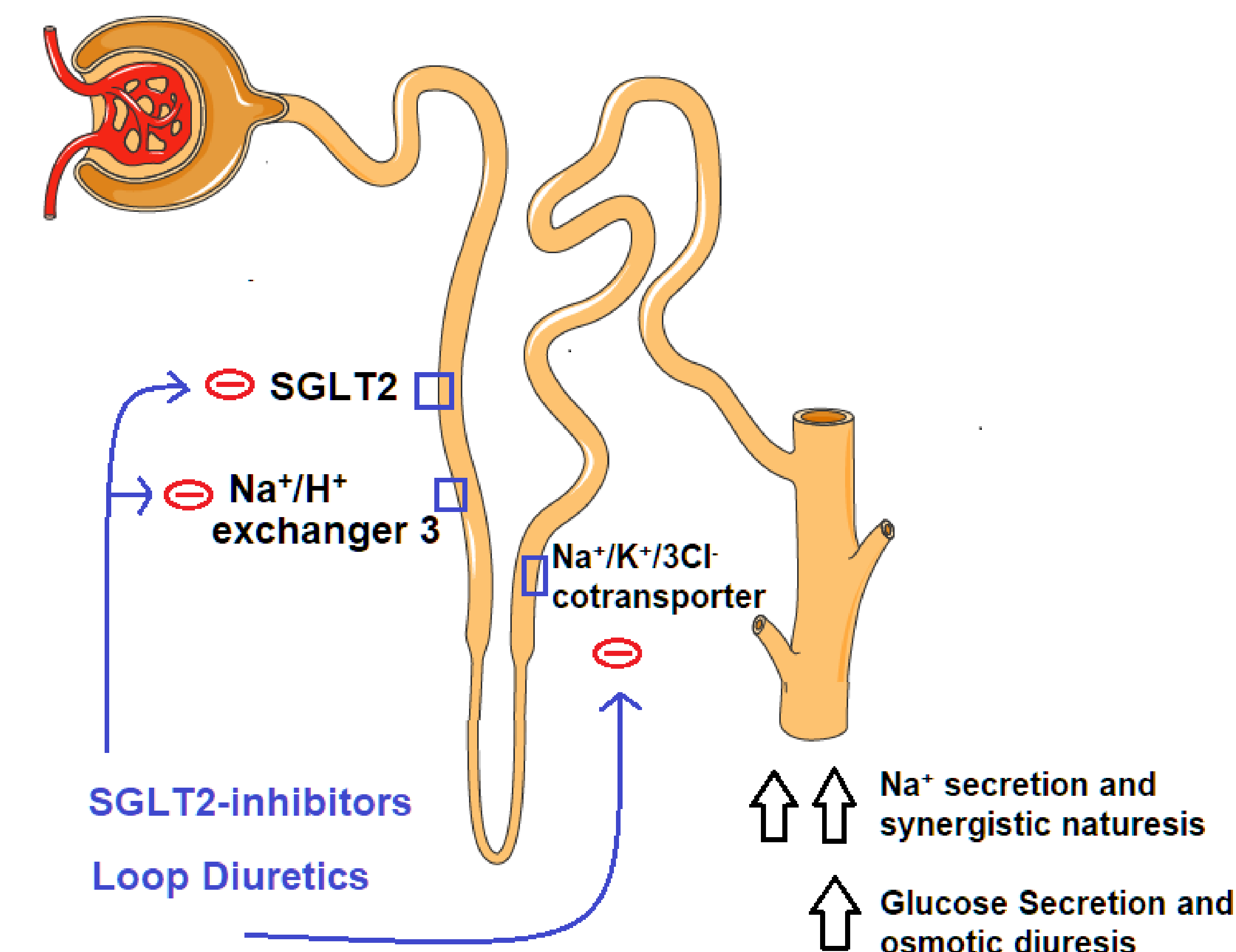


Figure 2. Two medication classes work synergistically to cause diuresis

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