Tenofovir Alafenamide Fumarate Induced Hypoglycemia in HIV Positive Patient with Insulin Dependent Diabetes

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Abstract

With the advances in highly active antiretroviral therapy, HIV is now considered a chronic disease. However, as the HIV population ages and have more co-morbidities, clinicians need to be increasingly aware about medication interactions. From our literature search, this is the first known case report of a patient switched from tenofovir disoproxil to tenofovir alafenamide and experienced improved renal proximal tubular function which we hypothesize led to improved insulin reuptake resulting in hypoglycemic episodes and subsequent need for insulin dose adjusting. Clinicians should be mindful of the potential for tenofovir alafenamide and insulin interactions and the need for vigilance when treating patients on high active antiretroviral therapy.

Keywords

Tenofovir alafenamide, Tenofovir disoproxil, Insulin, HIV, Proximal tubule

Case Presentation

A 51-year-old man with HIV and type 1 diabetes, being treated with darunavir/cobicistat with tenofovir disoproxil fumarate/emtricitabine and a Humalog insulin pump with stable dosing and an HbA1C of 9.3. His insulin dose had been unchanged by his endocrinologist for the prior four years and was 1.15 units per hour. Other comorbidities include hypertension and chronic kidney disease, hypogonadism, depression, erectile dysfunction. On 4/28/16 his urine protein/creatinine ratio was 218 mg/g, serum glucose was 183 mg/dl, urine glucose of 3+ on urinalysis, HbA1C of 9.3%, and serum creatinine was 0.85 mg/dl. He was switched from tenofovir disoproxil fumarate (TDF) to tenofovir alafenamide fumarate (TAF) in the setting of viral suppression in October of 2016. 2.5 weeks after switching TDF to TAF he presented to the clinic with a history of experiencing two separate hypoglycemic episodes at 39 mg/dl and 41 mg/dl and altered mental status changes which were successfully at home with oral glucose therapy. No obvious precipitating cause was found in the history. His Humalog was reduced to 0.85 units per hour and the hypoglycemic episodes subsided.
On 3/15/2017 his urine protein/creatinine ratio was 122 mg/g, his serum glucose was 205 mg/dl, urine glucose of 3+ on urinalysis, HbA1C was 9.8%, and creatinine was 0.95 mg/dl.

This possibly represents a case of improved proximal tubular function after switching from TDF to TAF causing increased Humalog reabsorption at the proximal tubule and thus a longer half-life triggering hypoglycemic episodes.

**Discussion**

Prescribers should be aware of patients regaining proximal tubular function in patients on insulin therapy as this may lead to prolonged insulin half lives and hypoglycemic episodes.

**References**