OBSERVATIONS

# Type 2 Diabetes and Impaired Glucose Tolerance in Two Young Adults Infected With HIV Early in Life

Even though studies demonstrate improved insulin resistance following alterations in HIV antiretroviral therapy (ART) (1), there are no published reports documenting reversal of diabetes. We report on one HIV-infected youth who met criteria for diabetes and one HIV-infected young adult with impaired glucose tolerance (IGT), both of whom experienced significant improvements at 1 and 2 years after ART modification.

Case 1 is a 15-year-old Caucasian male with vertically acquired HIV. He had 12 years of cumulative ART exposure. Past medical history included Burkitt's lymphoma in remission for 5 years, transient IGT, and adrenal insufficiency related to megestrol acetate at age 10, hypertriglyceridemia treated with fenofibrate, and lipoatrophy. At age 15 years and 9 months, he was on lamivudine/stavudine/tenofovir/lopinavir/ritonavir (started at age 11 years) with well-controlled HIV. Fasting glucose was 98 mg/dL, and 2-h postchallenge glucose was 96 mg/dL.

At age 16 years and 3 months, fasting glucose was 139 mg/dL. At age 16 years and 7 months, his ART changed for concerns of diabetes and lipodystrophy. Tenofovir and stavudine were removed, and abacavir was added. One month later, he had total cholesterol of 243 mg/dL and triglycerides of 477 mg/dL. Diabetes was confirmed by oral glucose tolerance test 2-h glucose measurement of 230 mg/dL.

As a result of dyslipidemia and diabetes, a further change in ART was recommended. At age 17 years and 6 months, lopinavir/ritonavir was replaced with ritonavir-boosted atazanavir. At age 17 years 8 and months, his lipid profile was markedly improved, his fasting glucose was 95 mg/dL, and his 2-h glucose measurement was 121 mg/dL. Diabetes was not present at subsequent glucose testing at age 18 years 2 months.

Case 2 is a 24-year-old African American male with trisomy 21 and transfusion-acquired HIV. He had been on continuous ART since age 9 years. His medical history is significant for an atrioventricular canal repair, chronic thrombocytopenia, and lipoatrophy.

At age 24 years and 10 months, he was on stavudine/lamivudine (started at age 16 years). Fasting glucose was 94 mg/dL, and 2-h postchallenge glucose was 194 mg/dL. He was symptomatic of hyperglycemia with excess thirst and urination, and had hypertriglyceridemia and low HDL. His ART regimen was modified at age 24 years and 11 months; stavudine was discontinued. The new regimen was lamivudine/abacavir/nevirapine. By age 25 years and 11 months, his 2-h glucose had normalized (91 mg/dL). His lipid panel and lipoatrophy improved, symptoms of diabetes had resolved, and HIV remained well controlled. During follow-up testing at age 27 years and 9 months his fasting and 2-h glucose measurements remained normal.

This report provides insight into the potential influence of ART exposure and ART modification on metabolic disturbances in HIV (2). De Wit et al. (3) reported an association between diabetes and cumulative stavudine, didanosine, and zidovudine exposure. Both cases reported here had prolonged exposure to all three agents and were on stavudine at presentation. Here, following alterations in ART regimens, the patients no longer met criteria for diabetes or IGT by glucose tolerance testing. In case 1, the replacement of lopinavir/ritonavir with atazanavir/ritonavir may have contributed to improvements in both glucose and lipid parameters (1).

In summary, our findings show that modifying ART may ameliorate metabolic abnormalities such as diabetes in patients with well-controlled HIV infection. This report highlights the need for close monitoring of metabolic complications and consideration of ART adjustments when feasible.

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