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Hepatic insulin resistance in HIV-associated lipodystrophy syndrome

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BACKGROUND: It has been suggested that an impaired hepatic glucose production (HGP) may be of significance to the insulin resistance in patients with HIV associated lipodystrophy syndrome (HALS).

OBJECTIVE: This study examined HGP in patients with HALS, including the possible impact by the duration of antiretroviral treatment with nucleoside reverse transcriptase inhibitors (NRTI) and protease inhibitors (PI).

METHODS: Eighteen male patients with HALS (cases) and 18 male HIV patients without lipodystrophy (controls) were studied. All patients received highly active antiretroviral therapy (HAART) during more than 12 months prior to the study. HGP was determined after an overnight fast, using adjusted rimed-continuous ³H-glucose infusion, and was calculated using Steele's non-steady-state equations. Peripheral glucose disposal rate was measured by an euglycemic hyperinsulinemic clamp (40 mU/min/m²).

RESULTS: Despite increased fasting insulin level in HALS patients [84±12 versus 4h12 pM (mean±sEM), *P*=0.002] at normoglycaemia in both groups (5.0±0.2 versus 4.9±0.1mM), the fasting HGP did not differ in-between groups (cases: 82±3; controls: 80±3 mg glucose/min/m²). The peripheral glucose disposal rate was decreased in HALS patients (cases: 165±14; controls: 238±15 mg glucose/min/m², *P*=0.002). The duration of the NRTI treatment (cases: median 40 months, range 13-111; controls: median 33 months, range 3-97) did not correlate with fasting HGP (cases: *r*=0.01, *P*=0.96; controls: *r*=0.08, *P*=0.76, and pooled cohorts: *n*=36, *r*=0.02, *P*=0.89, respectively). Similarly, we did not find any correlation between the duration of the PI treatment (cases: median 36 months,

range 0-58; controls: median 22 months, range 0-54) and fasting HGP (cases: $r=0.09$, controls: $r=0.11$, and pooled cohorts: $r=0.12$, respectively].

CONCLUSIONS: The finding of a similar HGP in between groups, in spite of increased fasting levels of insulin in HALS patients, strongly suggests hepatic insulin resistance in the latter group. However, the peripheral insulin resistance is at least equally important to the defective insulin action in HALS, in view of the impaired peripheral glucose disposal rate in such patients. The data did not indicate any effect on HGP by the duration of the therapy with NRTI or with PI.

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