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Inappropriate glycated haemoglobin values and haemolysis in HIV-infected patients

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OBJECTIVES: To test the accuracy of glycated haemoglobin values (HbA1c) to predict mean glycaemia in HIV-infected patients.

METHODS: We analysed data related to 1350 consecutive HbA1c measurements performed in our biochemistry department (1238 from non-HIV-infected and 112 from HIV-infected patients, all devoid of any haemoglobinopathy) in a retrospective, transversal study. Mean fasting glycaemia measured during 6 weeks preceding the HbA1c assay (Measured-Gly) and HbA1c-estimated glycaemia (in mM=1.85×(%HbA1c)–4.78) (HbA1c-Gly) were compared. For HIV-infected patients, mean Hb, red cell volume, serum creatinine, CD4+ cell count, and HIV-viral load, were assessed during the 6 weeks preceding the HbA1c assay. Due to the results, we prospectively measured serum haptoglobin and orosomucoid in 296 other consecutive HIV-infected subjects. In all of them, we collected the same biological data and the medications used at the time of blood testing.

RESULTS: Measured-Gly was not significantly different in non-HIV-infected (6.95±3.23mM) and in HIV-infected patients (6.62 ±2.42 mM), and was correlated with HbA1c-Gly in both groups of samples. HbA1c-Gly was significantly decreased in HIV-infected (6.29±2.87mM) as compared with non-HIV-infected patients (7.29±3.41mM; $P<0.005$). HbA1c slightly overestimated Measured-Gly (mean 0.2%) in the non-HIV-infected patients while it undervalued it by 12.3% on average in the HIV-infected group. The difference between Measured-Gly and HbA1c-Gly was positively correlated with the red cell volume ($P=0.0001$) in the HIV-infected group. To explain these results,

we searched for the presence of haemolysis in HIV-infected patients. Indeed, in prospectively-studied 296 HIV-infected subjects, we showed that low haptoglobin (<0.5g/l), a biological marker of haemolysis, was frequent (22% of patients) and negatively correlated with the red cell volume. Treatment with the nucleoside analogues zidovudine, stavudine and lamivudine were associated with macrocytosis, while only lamivudine was significantly associated with low haptoglobin values.

CONCLUSIONS: HbA1c should be interpreted with caution in HIV-infected patients. Its under-evaluation of mean fasting glycaemia could be due to haemolysis, associated with lamivudine treatment. Further study is needed to specifically explore this hypothesis.



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