Liver Enzymes as Biomarkers for Hepatotoxicity of Statins in Patients with Dyslipidemia

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Abstract

Various chemical agents or pharmaceuticals as drugs administered into the body in increased concentrations for a long time may have hepatotoxic or carcinogenic effect. In human biomonitoring are used different biomarkers, which can confirm the presence of various chemical agents in the body and their effects on cells or molecules. The aim of the study is to biomonitoring of the hepatotoxic effects of statins (atorvastatin and rosuvastatin) as a chemical agents or drugs in therapy of patients with dyslipidemia, using biochemical biomarkers as liver enzymes. Materials and methods: Follow-up laboratory tests (AST, ALT, GGT, ALP, cholesterol, and triglycerides) were evaluated with biochemical analyzer Cobas Integra 400 Plus, after 6 months of treatment with statins. The study included 28 subjects, aged 28–84 years (the mean 63.7), 15 women and 13 men, mainly patients with confirm dyslipidemia. Results: The observation of total serum transferases confirmed that 20 of the subjects (71.42%) have a normal serum transferases (AST and ALT) but 8 of the subjects (28.58%) (Groups 1 and 2) have a abnormal level of serum transferases. Subjects in Group 1 (5 subjects with atorvastatin therapy) have an abnormal level of serum transferases (AST and ALT), the mean value of AST was 43.6 U/L and for ALT 73.6 U/L. Subject in Group 2 (3 subjects with rosuvastatin therapy) has >10 times more of the level of AST and ALT (the mean value of AST was 580.3 U/L, and ALT 1802.3 U/L). In the Group 2 we reported older patients (with the ages after 60) with long time therapy with rosuvastatin (more than 6 months) who demonstrated significant elevation of ALT according with other chronical diseases as a cardiovascular diseases, diabetes mellitus type 2, acute pancreatitis and in alcohol abusers. Conclusions: We want to emphasize the importance of biomonitoring of liver enzymes as biomarkers which associates hepatotoxicity. Statins therapy (on patients with dyslipidemia) combined with other metabolic drugs and inhibitors, might increase the risk of liver injury. Individual differences, such as sex, age, sensitivity and immune ability, affect the degree of hepatotoxicity of various drugs (in our study statins) as a chemical agents present in the body.

Keywords

Statins • Dyslipidemia • Liver enzymes • Hepatotoxicity • Biomonitoring

1 Introduction

Biological monitoring is a set of activities which can confirm the toxic effects of different substances present in the body. Most of these activities use the qualitative (cytological and histopathological) or quantitative methods (by determining the concentrations of different substances and their metabolites in biological media such as blood, urine, serum, specific tissues, etc.). In addition, biomonitoring can confirm or exclude the cytotoxic or genotoxic effect of various physical and chemical agents present in the body, especially in the conditions of its chronical exposure. It means that various chemical agents or pharmaceuticals as drugs administered into the body in increased concentrations for a long time may have toxic or carcinogenic effect. In human biomonitoring are used different biomarkers, which can confirm the presence of various chemical agents in the body and their effects on cells or molecules. The term "marker" define any substance or change in the cells or tissues that can

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