METABOLIC DISORDERS IN SUBSIDED CASES OF MULTIBACILLARY TYPES OF LEPROSY

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Introduction

Hepatic involvement is common in leprosy. Many descriptions are found in literature (Contreras F,J,R. et al., 1969; Kaur S. et al.,1974; Patnaik J.K. et al.,1989). Histopathological examination of the liver is abnormal in up to 90% in the patients with LL (Loginov V.K. et al.,1971: Job C.K. et al.,1994) Some of the hepatic lesions progressed to stellate fibrosis and early cirrotic changes. Functional derangement is the main feature in LL cases irrespective of the extent and duration of the disease. Cirri G.P. et al. (1968) Kaur S. et al. (1974) and Gupta M.C. et al. (1975) indicate that the liver is the unique organ where the leprosy-specific changes in the cells of the reticuloendothelial system persist for a long time, at least in some patients who have, apparently, specific metabolic prerequisites for creating such situation. Chronic hepatitis is one of the basic consequences of leprosy and long duration chemotherapy.
It is known, that oxygen species play a significant role in inflammation processes and damage of visceral organs and other tissues in leprosy (Sethi N.C. et al., 1996; Reddy Y.N. et al., 2003). It is also known, that protease–antiprotease imbalance plays a significant role in tissue injury.

Aim

To investigate oxidative stress indices and antiproteases level in subsided cases of multibacillary types of leprosy.
Materials

Fifty multibacillary leprosy patients with subsided leprosy after long duration of antibacterial multi drug therapy (MDT) were studied. The duration of illness (including relapsed leprosy cases) varied from 20 to 30 years. All patients were smear negative and had no histological evidence of inflammation on biopsies. Chronic hepatitis was observed in 14 from these patients. They showed significant clinical symptoms of hepatitis: pain in the right upper quadrant of abdomen, enlarged liver. Ultrasonography: liver surface irregular, paranchimal structure heterogenous. Hepatic dysfunction and damage was also noted by raised thymol turbidimetry, raised levels of serum transaminases (GOT and GPT) and low levels of total cholesterol.
Methods

Secondary products of lipid peroxidation (LPO) were determined in heptane-isopropanol extracts of blood plasma by ultraviolet spectroscopy method (278 nm). Malondialdehyde (MDA) levels by spectrophotometric assay of the thiobarbituric acid (TBA)-reactive substances in blood serum samples based upon light absorption at 535 nm were also investigated. Absorbance were analyzed in spectrophotometer Varian Cary Win UV (Australia). Results expressed as absorption units in milliliter of lipid extract (AU/ml) in both cases.
Concentration of α-1-antitrypsin (α1AT), α-1-acid glycoprotein(α1GP), α-2-macroglobulin (α2MG) and haptoglobin (HP) were determined in blood serum by immunoturbidimetric method (immunoturbidimetric test-systems «Human», Germany). Immunoturbidimetry performed on the photometer Humalyser 3000 (Germany). We have compared the significance in the mean ± standard deviation values of LPO, MDA and the levels of α1AT,α1GP,α2MG, HP using one way analysis of variance between leprosy patients with chronic hepatitis and other patients. The results were significant at P<0.05.
Results

Differences between groups of patients in optical density of LPO products in heptane lipid extracts of blood plasma were not statistically significant (P>0.05). The levels of LPO in isopropanol lipid extracts and MDA increased significantly (P<0.01) in leprosy patients with chronic hepatitis (0,505 ±0,02 AU/ml and 1,201±0,01 AU/ml) in comparison with other patients (0,250±0,01 AU/ml and 0,403±0,01 AU/ml) respectively. It means presence of high free radicals activity in patients with liver damage.

Concentrations of α1AT,α1GP,α2MG, and HP were also significantly (P<0.05) elevated in patients with chronic hepatitis (389,77± 21,5 mg/dl; 164,61± 30,20 mg/dl; 328,8 ± 64,66 mg/dl; 62,20± 17,40 mg/dl in comparison with other patients (298,40± 15,60 mg/dl; 75,20±7,00 mg/dl; 210,15 ± 14,64 mg/dl; 35,99±6.89 mg/dl) respectively.
Conclusion

High levels of lipid peroxidation products, malondialdehyde, α-1-antitrypsin, α-1-acid glycoprotein, α-2-macroglobulin and haptoglobin are of great diagnostic importance at subsided leprosy patients with chronic hepatitis and reflect a degree of oxidative stress and chronic hepatitis activity. It serves as a criterion for application suitable anti-oxidant therapy for these patients to prevent liver tissue injury. Usage of systemic enzyme therapy seems to be an actual line towards improvement of treatment of leprosy patients with damaged liver and deserves further and more extended studies.