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Original Research

Serum Interleukin-12 Levels in Alcoholic Liver Disease

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ABSTRACT:

Aim: The study aimed to assess IL-12 serum levels in alcoholic patients. **Materials and methods**: The study included 50 patients with alcoholic liver disease and 30 healthy adults with no alcohol consumption as controls. The alcoholic patients consumed an average of at least 50 g of ethanol per day for over 5 years. Among the alcoholic patients, 25 were diagnosed with alcoholic cirrhosis. Data analysis was done using SSPS software. **Results:** IL-12 levels remained elevated in the cirrhosis group compared to the control group. Patients who continued alcohol consumption had higher serum IL-12 levels compared to those who abstained across the cirrhosis group. **Conclusion**: Significant association was seen among interleukin levels inpatients with Alcoholic Liver Disease.

Keywords: Alcoholic, Liver, Disease

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INTRODUCTION

Chronic alcoholism, with or without alcoholic liver disease (ALD), is known to induce significant immunological changes in various peripheral blood (PB) cell subsets.[1] The nature of these alterations is influenced not only by the presence of ALD but also by the amount of ethanol (EtOH) intake.[2] These immune system disturbances in alcoholism are believed to be driven by cell interactions, either through direct cell-to-cell contact or via soluble cytokines.

Interleukin-12 (IL-12), a cytokine with critical roles in immune regulation, has been shown to impact the functions of natural killer (NK) cells and T-cells. IL-12 can promote cell proliferation, enhance cytotoxic activity, stimulate cytokine production, and favour a Thelper-1 (Th-1) cell response over a Th-2 cell response.[3,4] Recent studies have highlighted associations between active EtOH consumption in chronic alcoholic individuals, both with and without liver disease, and alterations in the PB T-cell compartment as well as expansions in NK-cell populations, leading to increased NK cell activity[5].While the specific relationship between IL-12 and alcohol remains largely unexplored, it is hypothesized that elevated IL-12 levels could contribute to the observed changes in PB T and NK-cell subsets in chronic alcoholism[6,7]. This study aimed to assess IL-12 serum levels in alcoholic patients to investigate their correlation with EtOH intake and the presence of liver disease.

MATERIALS AND METHOD

The study included 50 patients with alcoholic liver disease and 30 healthy adults with no alcohol consumption as controls. The alcoholic patients consumed an average of at least 50 g of ethanol per day for over 5 years. Among the alcoholic patients, 25 were diagnosed with alcoholic cirrhosis.The study followed the patients for nine months, measuring serum IL-12 concentrations at each follow-up. The patients were advised on education and abstinence from alcohol, and regular follow-up tests were conducted to monitor alcohol abstinence.Serum IL-12 levels were measured using a commercial enzyme-linked immunosorbent assay.Data analysis was done using SSPS software.

RESULTS

In the study, patients with alcoholic liver cirrhosis were characterized by older age, greater daily alcohol intake, and longer duration of alcohol consumption compared to other patient groups. Serum IL-12 levels were found to be high in alcoholic liver cirrhosis group (112.6 pg/mL). IL-12 levels remained elevated in the cirrhosis group compared to the control group (significant differences).

Table 1: Clinical characteristics and serum interleukin-12 levels in controls and patients with alcoholic cirrhosis

	Controls (n=30)	Alcoholic cirrhosis (n= 25)
Age (yr)	**56.1**	**52.8**
Interleukin-12 (pg/mL)	**37.5**	**112.6**

DISCUSSION

Alcoholic liver disease is a term used to describe a range of liver conditions caused by excessive alcohol consumption. It encompasses various stages of liver damage, including fatty liver (steatosis), alcoholic hepatitis, and cirrhosis. Fatty liver occurs when excess fat accumulates in liver cells due to alcohol metabolism.[8,9] Cirrhosis is the advanced stage characterized by scarring of the liver tissue, leading to impaired liver function and potentially life-threatening complications. Alcohol abuse over time can significantly impact the liver's ability to function properly, ultimately resulting in alcoholic liver disease. Early detection and cessation of alcohol consumption are crucial in managing and potentially reversing the effects of this condition.[10]

Serum IL-12 levels were found to be high in alcoholic liver cirrhosis group (112.6 pg/mL). IL-12 levels remained elevated in the cirrhosis group compared to the control group (significant differences). Tung KH et al, aimed to explore the relationship between IL-12 serum levels and different stages of alcoholic liverdisease, alcoholic intake status and abstinence from alcohol.Mean serum IL-12 levels were higher in the alcoholic hepatitis group (163.1±57.8 pg/mL) than in the alcoholic livercirrhosis group (110.5±41.6 pg/mL) and alcoholic steatosis group (74.4±26.2 pg/mL). All of these 3 alcoholic groups hadhigher serum IL-12 levels than the control group (39.3±8.3 pg/mL; $p < 0.02$). Among the patients who abstained from alcohol, there was no difference in serum IL-12 levels between control and steatosis patients at the 9th month, but the serumIL-12 levels of the hepatitis and cirrhosis groups were still higher than in the control group ($p < 0.001$ and $p = 0.001$, respectively). In addition, the patients who continued to drink alcohol had higher serum IL-12 levels than those who abstained fromalcohol in the steatosis, hepatitis and cirrhosis groups. At the cut-off value of 54 pg/mL, IL-12 had good sensitivity andspecificity in the diagnosis of alcoholic liver disease.Serum IL-12 levels reflected the different stages of alcoholic liver disease and can represent the status ofcontinuous alcohol consumption.[11]Laso FJ et al analysed serum levels of interleukin-12 in alcoholic patients in order to explore the possible relationship between them and both the ethanol intake status and the existence of alcoholic liver disease. Their results show that interleukin-12 serum levels are significantly increased in AWLD patients as compared to normal controls ($p<0.05$). In patients with cirrhosis, interleukin-12 serum levels varied, depending on the ethanol intake status at the time of evaluation. Accordingly, as compared to normal controls, significantly increased concentrations of serum interleukin-12 were found in the alcoholic liver cirrhosis patients with active ethanol intake (ALCET group) ($p<0.01$), while in the cirrhotic individuals with at least 1 year of alcohol withdrawal interleukin-12 serum levels remained within the normal range. Only the cirrhotic patients had increased interferon-gamma serum levels. Among them, the highest levels were found for individuals from the ALCET group, the differences with respect to the healthy subjects being close to statistical significance ($p=0.05$). No significant differences were detected regarding interleukin-4 serum levels for any of the groups of patients analyzed compared to the control individuals. Their results showed the existence of a relationship between ethanol intake and increased interleukin-12 serum levels, suggesting that this cytokine may play an important role in the induction of the immunological abnormalities found in chronic alcoholism, independently of whether or not alcoholic liver disease is present.[12]

CONCLUSION

In conclusion, our findings establish a clear association between ethanol intake and heightened serum levels of interleukin-12, indicating a direct influence of alcohol consumption on immune factors in the body.

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