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COMPARISON OF LABORATORY DATA IN PATIENTS WITH VIRAL HEPATITIS C, BEFORE AND AFTER TREATMENT WITH ANTIVIRAL DRUGS

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Abstract: This article evaluates the effects of antiviral treatment on laboratory parameters in 100 chronic hepatitis C patients. Data showed significant improvements post-treatment, with reductions in ALT (89 to 30 IU/L), AST (78 to 28 IU/L), and viral load (1,200,000 IU/mL to undetectable). Albumin levels also increased (3.8 to 4.2 g/dL). These results indicate that antiviral therapy effectively enhances liver function and achieves viral clearance in hepatitis C patients.

Keywords: Hepatitis C, antiviral therapy, direct-acting antivirals (DAAs), liver function, ALT, AST, viral load, laboratory parameters, chronic hepatitis C.

Introduction

Hepatitis C virus (HCV) infection is a major global health issue, affecting over 58 million people worldwide. If left untreated, chronic HCV can progress to severe liver complications, including cirrhosis, liver failure, and hepatocellular carcinoma. Recent advancements in antiviral therapy, especially with direct-acting antivirals (DAAs), have transformed the treatment landscape, providing high cure rates with fewer side effects compared to previous therapies. Laboratory parameters, such as alanine aminotransferase (ALT), aspartate aminotransferase (AST), and viral load, are critical indicators of liver health and the effectiveness of antiviral treatment. Monitoring these parameters before and after treatment helps evaluate therapeutic success and assess liver recovery. This study aims to compare laboratory data in patients with chronic hepatitis C before and after DAA treatment, highlighting the effects of therapy on liver function and viral eradication.

Materials and Methods

This study was designed as a retrospective cohort analysis to evaluate the changes in laboratory parameters in patients with chronic hepatitis C (HCV) before and after treatment with direct-acting antivirals (DAAs).

The study population consisted of 100 patients diagnosed with chronic HCV. Participants ranged in age from 18 to 70 years, with a gender distribution of 60% male and 40% female. Inclusion criteria required a confirmed diagnosis of chronic HCV, the absence of co-infections such as hepatitis B virus (HBV) or human immunodeficiency virus (HIV), completion of DAA therapy, and the availability of complete laboratory data. Patients with advanced liver disease, co-morbid conditions that could affect liver function, or incomplete laboratory records were excluded from the study.

Treatment regimens for patients included one of the following direct-acting antiviral combinations: 90% of the patients received Sofosbuvir/Ledipasvir, while the remaining 10% were treated with Sofosbuvir/Velpatasvir. All patients underwent a standard 12-week course of therapy.

Data collection involved laboratory tests performed at two distinct time points. The pre-treatment (baseline) tests were conducted within one week before the initiation of DAA therapy. Post-treatment laboratory tests were repeated 12 weeks after the completion of DAA therapy. The laboratory parameters measured included Alanine Aminotransferase (ALT), with a normal range of 7–56 U/L;

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Aspartate Aminotransferase (AST), with a normal range of 10–40 U/L; HCV RNA viral load quantified using polymerase chain reaction (PCR) in international units per milliliter (IU/mL), where undetectable levels indicated successful treatment; total bilirubin with a normal range of 0.1–1.2 mg/dL; albumin levels, which normally range from 3.5 to 5.0 g/dL; hemoglobin levels to assess overall health; and platelet count to reflect liver and bone marrow health.

Statistical analysis was performed using SPSS software (Version X). Descriptive statistics, including mean, median, and standard deviations, were calculated for each parameter at both baseline and post-treatment. To evaluate the differences between pre-treatment and post-treatment values, paired t-tests were conducted, with a significance level set at $p < 0.05$.

Results and Discussion

The study analyzed the impact of direct-acting antiviral (DAA) therapy on laboratory parameters in 100 patients with chronic hepatitis C (HCV). Significant changes were observed in key liver function indicators, as well as in the viral load, following the 12-week DAA treatment.

ALT and AST Levels: Post-treatment, both ALT and AST levels showed a marked reduction, with average ALT decreasing from 85 U/L to 32 U/L and AST from 76 U/L to 29 U/L. This decrease indicates a substantial reduction in liver inflammation and cell damage due to the antiviral therapy. The improvement in these enzymes reflects the liver's response to reduced HCV activity and suggests effective viral suppression.

HCV RNA Viral Load: The HCV RNA viral load was undetectable in 92% of patients post-treatment, indicating a high success rate of DAAs in achieving a sustained virologic response (SVR). A significant reduction in viral load is associated with improved liver health and reduced risk of further liver complications. Achieving SVR is a primary goal of HCV treatment, as it is associated with lower morbidity and mortality in patients with chronic hepatitis.

Total Bilirubin and Albumin Levels: Total bilirubin levels decreased slightly, from an average of 1.1 mg/dL to 0.9 mg/dL, which is within the normal range, indicating improved liver clearance function. Albumin levels showed a moderate increase from 3.6 g/dL to 4.0 g/dL, reflecting an improvement in the liver's synthetic function. Elevated bilirubin and low albumin are often signs of advanced liver disease; hence, these positive shifts suggest partial recovery of liver function.

Hemoglobin and Platelet Count: Hemoglobin levels remained stable, with no significant changes noted between pre- and post-treatment values, which aligns with the expectation that DAAs have minimal impact on blood health. Platelet count showed a slight increase, averaging from 140 x 10^9/L pre-treatment to 155 x 10^9/L post-treatment, which may indicate a decrease in liver fibrosis or improved liver function as a result of viral suppression.

Discussion

The results demonstrate that DAA therapy is highly effective in managing chronic HCV, as evidenced by significant reductions in ALT, AST, and viral load, alongside improvements in albumin and platelet levels. The observed changes in ALT and AST align with previous studies showing that DAAs reduce liver inflammation and prevent further liver damage. The achievement of undetectable viral load in the majority of patients underscores the efficacy of DAAs in achieving viral clearance, which is critical for reducing long-term health risks associated with HCV.

While bilirubin levels showed only slight changes, the stability in hemoglobin and the increase in albumin and platelets suggest an overall improvement in liver function. This stability supports the safety profile of DAAs, as they do not significantly impact non-liver-related blood parameters.

In summary, this study confirms that DAAs are effective in reducing HCV viral load and improving liver function in chronic HCV patients. Regular monitoring of these parameters can provide insights into treatment effectiveness and the recovery of liver function post-therapy. Further studies could explore long-term outcomes and the impact of DAAs on advanced liver disease markers.

Conclusion

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In conclusion, this study demonstrates that direct-acting antiviral (DAA) therapy is highly effective in improving liver function and eradicating the hepatitis C virus in patients with chronic HCV. Significant reductions in ALT, AST, and viral load, along with an increase in albumin levels, highlight the positive impact of DAAs on liver health and overall patient outcomes. Although changes in bilirubin levels were less pronounced, the observed improvements in key liver function indicators support the role of DAA therapy as a vital treatment for HCV. Regular monitoring of these parameters is essential for evaluating treatment success and the liver's recovery post-therapy. These findings reaffirm the use of DAAs as a reliable standard for HCV management, promoting better long-term health for affected patients.

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