Serum Liver Enzyme Levels: A Hospital-Based Observational Study from Kashmir

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ABSTRACT

Background: Liver disorders are one of the most common causes of health problems all over the world owing to evolving lifestyles and dietary patterns. In this retrospective study, we aimed to explore the impact of dietary habits on liver enzymes among the Kashmiri population.

Methods: A total of 18462 patients were registered in the outpatient/Inpatient sections of the tertiary care hospital of Kashmir for various investigations from March to November 2020. In the liver function profile, a total of 7715 samples were tested for Aspartate transaminase (AST), 12084 for Alanine transaminase (ALT), 12573 for total bilirubin, 131472 for albumin, Alkaline phosphatase for 12762, and 12181 for Lactate dehydrogenase (LDH) parameters.

Results: The average value documented for aspartate transaminase (AST), alanine transaminase (ALT), total bilirubin, total protein, and albumin were 39.06 U/L, 38.81 U/L, 0.91 mg/dL, 7.31 g/dL, and 4.22 g/dL respectively which are considered normal. However, ALP and LDH were found to be little elevated among various liver function parameters. Alkaline phosphatase (ALP) and Lactate dehydrogenase (LDH) had average values of 148.66 and 260.25 U/L, respectively.

Conclusion: Our findings revealed the rising levels of alkaline phosphatase (ALP) and Lactate dehydrogenase (LDH), this paradigm shift could be attributed to a sedentary lifestyle and unique dietary habits.

Keywords: LFT, Kashmir, Biochemical investigations, Liver disease.

1. Introduction

Liver disease rates are steadily increasing over the years and about 2 million people die each year from liver disease, 1 million from cirrhosis, and 1 million from viral hepatitis and hepatocellular carcinoma (HCC)¹ and representing them the 11th and 16th most common causes of death, respectively.

They are responsible for 3.5 percent of all deaths on the globe. The burden is likely to be higher when acute hepatitis and alcohol-use disorders (AUDs) are considered. In the United States, liver diseases are the second leading cause of death among all digestive diseases². Non-alcoholic fatty liver disease (NAFLD) is a major health problem in Western countries, affecting 30% of the adult population and 60%-80% of patients with diabetes mellitus and/or obesity³. According to the 2011 survey of National Health and Nutrition, the incidence of NAFLD, obesity, and diabetes mellitus have all risen in unison since the 1988-1994 study revealing that NAFLD is a connecting link with obesity and diabetes⁴.

India's liver disease-related deaths have reached 259,749 per year. It accounts for 2.95 percent of all deaths. India ranks 63rd in the world with a death rate of 22.93 per 100,000 of population⁵. With the global epidemic of obesity, hypertension, and type II diabetes, there is a rise in the incidence and prevalence of NAFLD in India^{6, 7}.

Kashmir is known for its unique dietary habit of having a rich fat diet and a special Kashmiri cuisine called wazwan, comprising of 7 to 36 dishes of meat or beef and chicken. Ethnic meat products are high in calories, saturated fatty acids, and cholesterol. High animal fat diets are associated with several types of disorders such as obesity, hypertension, cardiovascular diseases, and coronary heart diseases^{7, 8}. According to some of the studies,

Kashmir is at the brim of liver disease mainly NAFLD due to the diet which is heavily loaded with fat⁹. In Kashmir, the overall prevalence of NAFLD was 7.2% with the highest prevalence in the age group of 16-18¹⁰.

Since there is limited data available on the incidence and prevalence of liver diseases in Kashmir. This study aimed to find out whether there is an impact of dietary pattern on liver function parameters among the Kashmiri population who visited the main tertiary care hospital, Sher-I-Kashmir Institute of Medical Sciences, Soura Srinagar, for various ailments. This hospital is the valley's largest tertiary care hospital, providing the best healthcare management for patients from all over the valley.

2. Materials and Methods

This retrospective study included all subjects who visited SKIMS hospital from all districts of Kashmir valley for clinical advice after being diagnosed with a variety of ailments and were recommended to undergo various Biochemistry investigations by doctors of various specialties from the OPD/IPD. The analysis on different biochemical parameters was performed by the Department of Clinical Biochemistry, Sher-I-Kashmir Institute of Medical Sciences from March 2020 to November 2020. The patient's serum biochemical tests were performed on auto-analyzers (BECKMAN COULTER AU5800) using commercially available reagent kits from Beckman Coulter Ireland Inc. AST, ALT, LDH, and ALP were measured by the IFCC Reference method. Bilirubin and albumin were evaluated by DPD and Bromocresol Green method respectively.

Statistical data analysis was performed on version 16 of the STATA software (STATA Corp., College Station, TX, USA). The study was interpreted as Mean±Standard deviation.

3. Results

Clinicians from various specialties of the hospital recommended 18462 patients for different biochemical parameters like Kidney function and Liver function test parameters. Some were recommended whole LFT panel and some few parameters. Among all, the AST, ALT, TBIL, TP, Albumin, ALP, and LDH were documented. Except for ALP and LDH, all liver parameters were found within the acceptable range. However, ALP and LDH were recorded as 148.66±131.86 and 260.25±50.25 respectively. This data is summarized in Table 1.

Table 1. Mean value of liver function parameters

Parameter	Normal Range	Number	Mean (±)SD	Min	Max
AST	0-45	7715	39.06± 31.0	02	392
ALT	0-45	12084	38.81±37.8	01	458
TBIL	0.3-1.5	12573	0.91±0.45	0.01	82.85
TP	5.5-8.5	12622	7.31±0.789	0.03	13.2
Alb	3.5-5.2	13147	4.22±0.817	0.19	8.7
ALP	30-141	12762	148.66±131.86	32	1257
LDH	25-248	12181	260.25±50.25	27	1325

Table 2. Percentage of Normal, Elevated and Low liver biochemical parameters

Variable	N	Percentage
AST		
Normal	6059	79
Elevated	1656	21
ALT		
Normal	9219	76
Elevated	2865	24
Total Bilirubin		
Normal	11040	88.09
Elevated	1156	9.22
Low	377	3
Total Protein		
Normal	12169	96.41
Elevated	267	2.11
Low	186	1.47
Albumin		
Normal	10808	82.20
Elevated	513	3.90
Low	1826	13.88
ALP		
Normal	8014	62.79
Elevated	4748	37.2
LDH		
Normal	7187	59
Elevated	4994	41

On a superficial look, the percentage of normal, elevated, and low liver biochemical were illustrated in Table 2.

4. Discussion

The major findings of this study were that LDH and ALP were a little higher to some extent among the Kashmiri population. Although both enzymes (LDH and ALP) are the liver enzymes indicating liver damage¹¹, apart from this they are the biomarkers of the diversity of diseases^{12,13}. LDH is a well-known biomarker for myocardial Ischemia hence associated with the risk of coronary artery diseases¹⁴. The clinical studies have shown that LDH is elevated in the COVID-19 patients¹⁵. Mudassar et al., also reported elevation of LDH in patients with COVID-19

among the Kashmiri population¹⁶. ALP is also associated with heart diseases as a diagnostic marker to assess stroke^{17,18,19}. The increased serum ALP is directly associated with the risk of cardiovascular stroke.

It has been seen that the people of Kashmir are consuming a more fat-rich diet (wazwan)¹⁰, junk food that contains saturated fats and more sugar that might have effects on these biochemical parameters like ALP and LDH. Most clinicians recognize intake of fat-rich dietary habits with heart disease.

There is also a limitation in this study as it was an observational study with no follow-up with the participants.

5. Conclusion

Our data revealed that the biochemical parameters like AST, ALT, total bilirubin, total protein, albumin were normal but the ALP and LDH were increased to some very less extent. One of the reasons for the increased levels of these two parameters could be the diet intake of more saturated fats.

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Declarations

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Competing Interests Statement

The authors declare no competing financial, professional and personal interests.

Ethical Approval

Ethical approval for this research was given based on institutional guidelines.

Consent to participate

The consent to participate in this research was sought for and approved by the subjects to be used

Consent for publication

We declare that we consented for the publication of this research work.

Availability of data and material

Authors are willing to share data and material according to the relevant needs.

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