



A Female Case with Alcohol-Associated Liver Disease (ALD) and Medical and Psychological Problems

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Abstract

Current case is a 54-year-old female with alcohol-associated liver disease (ALD). She suffered from depression, panic disorder, and self-harm in her 30's, and has recently drunk more. The blood chemistry in 2023 showed AST 144 U/L, ALT 22 U/L, gamma-glutamyl transpeptidase (GGT) 1117 U/L, uric acid (UA) 12.2 mg/dL, and mean corpuscular volume (MCV) 115 fL, and then she was hospitalized and treated. Furthermore, she was diagnosed with psoriasis, probably related to alcoholism. She recently showed improvement in blood tests, and fatty liver, gallstones, and a pancreatic cyst by abdominal CT scan. Elevated AST/ALT ratio may indicate the advance of liver fibrosis.

Keywords

Alcohol-Associated Liver Disease, Mean Corpuscular Volume, Psoriasis, AST/ALT Ratio, Gamma Glutamyl Transpeptidase

Abbreviations

ALD: Alcohol-Associated Liver Disease; MCV: Mean Corpuscular Volume; GGT: Gamma Glutamyl Transpeptidase

Introduction

Across the world, alcohol-associated liver disease (ALD) has been crucial for many years [1]. It influences medical, psychological, social, and economic matters [2]. Among them, several alcohol-related biomarkers have been discussed in various studies for liver function tests [3]. To detect the risk for ALD, several non-invasive tests (NITs) can be used for decreasing the burden [4]. They include aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyl transpeptidase (GGT), and so on.

Furthermore, medical problems of ALD include other biomarkers, such as carbohydrate-deficient transferrin (CDT) and mean corpuscular volume (MCV). MCV is a non-specific biomarker that may be influenced by age, smoking, liver disease, malnutrition, and hypothyroidism [5]. When a case with elevated MCV is discovered, various backgrounds will be investigated for chronic alcoholism, liver disorder, malabsorptive disorders, dietary deficiency, and others [6].

Authors et al. have continued clinical research and

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practice in the primary care situation [7]. We happened to encounter a female patient who has an ALD problem. Several detailed evaluations were conducted, and then her medical progress with some perspectives will be described in this article.

Case Presentation

The patient is a 54-year-old female with current medical problems including hypertension, heavy alcohol consumption, and blood tests showing hyper-GTP and macrocytic anemia. As for her medical history, she underwent surgery for appendicitis at the age of 10. From the age of 30, she developed depression and panic disorder and was mentally unstable, including engaging in self-harm. She has been receiving medication at a psychiatric hospital for many years. At the age of 35, she was diagnosed with high blood pressure and was taking anti-hypertensive drugs, but she had some episodes of not taking them for several months.

In 2015 (44 years old), she was unsteady, fell, and broke her right ankle, and was hospitalized. Since the summer of 2022, she has had no appetite and was drinking more than before. She drank about 3.5 glasses of shochu (Japanese sake, 1 glass = 180 mL, alcohol content 25%) or more per day. In August 2023, she

began to feel unsteady, and exanthema appeared on her scalp, face, left upper limb, right ankle, and other parts of her body. In September 2023, she was hospitalized for two weeks to abstain from alcohol.

Physicals and Exams

Her vital signs were within normal limits with normal speech and communication. On her physical exam, she did not show any particular abnormalities in the head, chest, abdomen, and neurological findings. Unremarkable changes were found in the chest X-ray and electrocardiogram (ECG). Concerning biochemistry, the liver function test showed extremely abnormal values of GGT, more than 1000 U/L. Furthermore, an elevated AST/ALT ratio had persisted for years. The changes in the biochemical data for years are summarized in (Table-1).

Abdominal ultrasound (US) showed that the liver was enlarged overall, with strong hepatorenal contrast, unclear vascular structure, and no SOL. There was no CBD expansion, no thickening of the gallbladder wall, and gallstones were present. There was no swelling or obvious abnormality in the pancreas, and the spleen was enlarged. Abdominal CT scan showed fatty liver, hepatomegaly, gallstones, and pancreatic cyst (Fig-1).

Table-1: Progress of Biochemistry Data

	2022	2023				2024	2025	Units	Normal Range
	Dec	Jan	Sept	Oct	Nov	Dec	July		
Admit Tx									
			Admit & Treat						
Liver									
T-Bil			2.5	0.8	3.1			(mg/dL)	
TP			8.3			7.6		(g/dL)	
AST	267		144	94	100	100	196	(U/L)	
ALT		33	22	41	32	23	26	(U/L)	
GGT		1519	1117	422	533	963	838	(U/L)	
ALP	302		183			145	163	(U/L)	38-113
LD	351		231		234	171	301	(U/L)	124-222
ChE		174	200					(U/L)	213-501
Amm					103			(µg/dL)	30-130
Pancreas									
Amy							44	(U/L)	38-136
Renal									
UA			12.2	7.0		7.6	9.5	(mg/dL)	
BUN					9	6	5	(mg/dL)	
Cre			0.42	0.48	0.51	0.48	0.45	(mg/dL)	
Na	138		138	139				(mEq/L)	

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Cl	95		96	100				(mEq/L)	
K	3.3		3.3	4.6				(mEq/L)	
Lipids									
HDL						50	36	(mg/dL)	
LDL						119	86	(mg/dL)	
TG	171					164	128	(mg/dL)	
Diabetes									
Glucose			123		106	113		(mg/dL)	
HbA1c			4.9			4.9		(%)	
CBC									
WBC	118		83	73	70	78	74	(x10 ³ /μL)	
RBC	388		351	385	407	404	341	(x10 ⁴ /μL)	
Hb	14.2		13.1	13.9	13.6	13.7	11.9	(g/dL)	
Ht	42.4		40.3	44.0	41.0	41.7	35.8	(%)	
MCV	109		115	114	101	103	105	(fL)	
MCH	36.6		37.3	36.1	33.4	33.9	34.9	(pg)	
MCHC	33.5		32.5	31.6	33.2	32.9	33.2	(%)	
PLT	17.3		8.9	21.3	10.5	14.3	14.9	(x10 ⁴ /μL)	

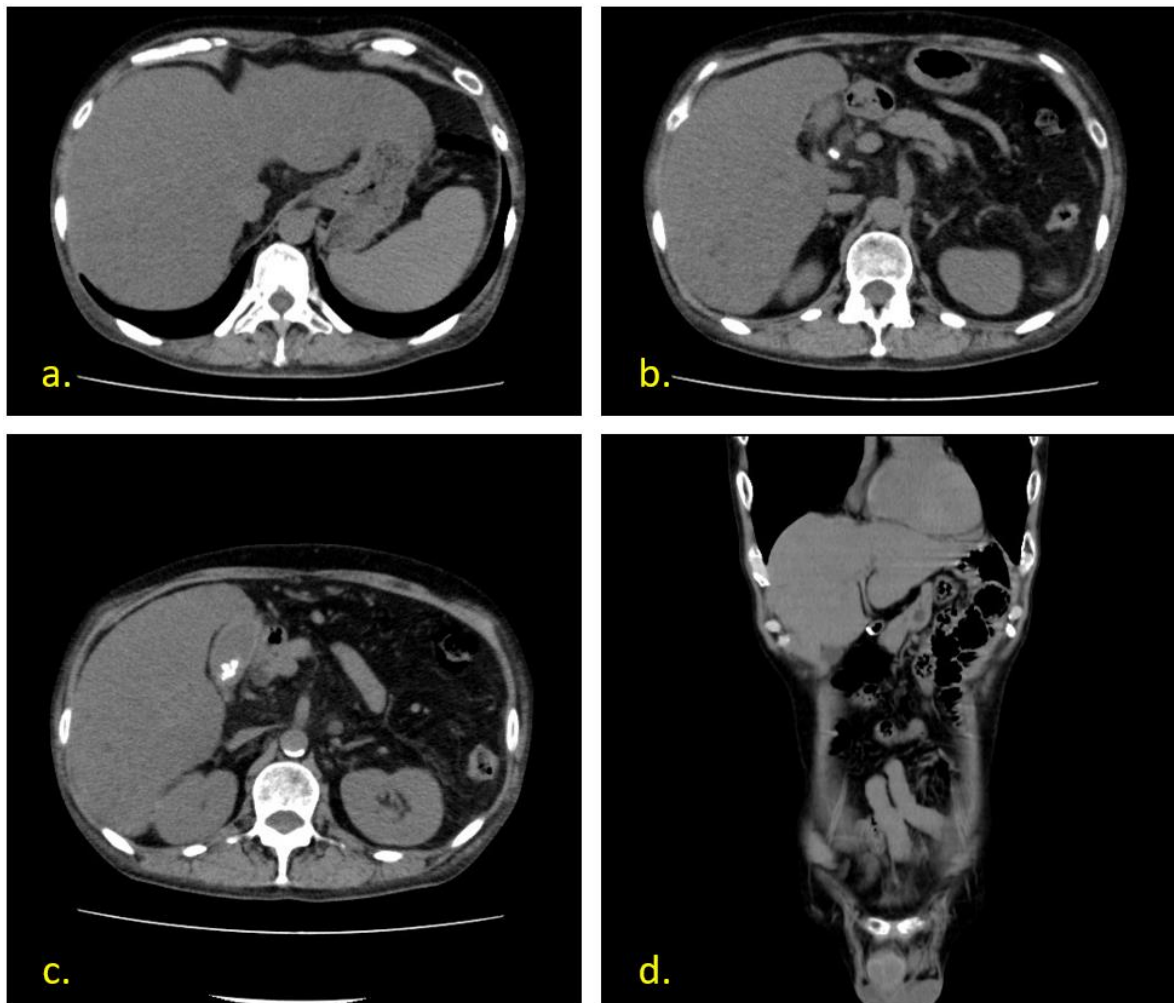


Fig-1: Findings of Abdominal CT Scan

a. Fatty Liver with Hepatomegaly; b. Gall Stone is Observed; c. Multiple Gall Stones are Found; d. Galls Stone and Pancreatic Cyst

Clinical Progress

By restricting alcohol consumption during her hospital admission, her symptom of general malaise decreased, and the liver function tests showed improvement from 1117 U/L to 42 U/L for GGT and from 144 U/L to 94 U/L for AST. After that, her clinical progress in the outpatient clinic has been rather stable. Current medication is summarized as amlodipine 2.5 mg, febuxostat 20 mg, and suvorexant 15 mg. Furthermore, she has complained of chronic generalized itching for years, and then she was introduced to a dermatologist. She was diagnosed with psoriasis and treated with Freprednate 10 g and Restamin Ointment 20 g.

Ethical Standards

This patient complied with the guideline of the Declaration of Helsinki [8]. The principle was along with the ethical regulation. The guideline is from the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Health, Labor and Welfare. The authors established an ethical committee in the hospital that included the president, physicians, nurse, nutritionist, pharmacist, and legal professional. The staff discussed the protocol enough and agreed. Informed consent was taken from the case in document form.

Discussion

Concerning this case, several medical problems include: i) alcohol consumption for years, ii) elevated GGT value as a liver function test, iii) elevated AST/ALT ratio, iv) probable alcoholic fatty liver, v) hyperuricemia due to alcoholism, vi) elevated MCV with possible macrocytic anemia, vii) psoriasis as a dermatologic problem, and viii) psychosomatic problems such as insomnia and unstable mental status.

These problems are interrelated: excessive alcohol consumption causes many problems, including elevated MCV, psoriasis, and psychological problems.

The current case showed an extremely high ratio of AST/ALT, with fatty liver findings by abdominal CT scan. These results showed ambiguous aspects of liver cirrhosis and fatty liver from excessive alcohol consumption. As a general tendency, AST/ALT ratio

would be high for liver cirrhosis and low for fatty liver [9]. A recent study of patients with fatty liver (n=120) showed 70% for ALD and 30% for non-alcoholic fatty liver disease (NAFLD) [10]. AST/ALT ratio was found to be 0.99 ± 0.70 and 1.18 ± 0.53 , respectively. Further, A/G ratio was 1.49 ± 0.45 and 1.79 ± 0.38 , respectively. A significant difference was observed in the ratios of AST/ALT, A/G, and TG/HDL. Another report analyzed data from the National Health and Nutrition Examination Survey (NHANES) (n=4753) [11]. Detailed biomarkers of NAFLD cases such as ALT/AST (inverse ratio of AST/ALT) showed positive correlation with the degree of liver fibrosis and steatosis. This link showed a robust tendency for females, adolescents, and children.

The association between alcohol consumption and psoriasis has been discussed so far. To investigate this relationship, a systematic review and meta-analysis was conducted for 48 studies (n=1.7 million from 24 countries) [12]. As a result, alcohol consumption amount showed a positive association with psoriasis with an odds ratio (OR) of 1.47. Further, OR for psoriasis increased by 4% with an increase of alcohol by 1 gram daily. This tendency was more prominent for cases drinking >45 g alcohol a day, equivalent to 3.2 alcoholic drinks daily. Generally, patients with psoriasis tend to develop liver fibrosis more, but it remains equivocal. To evaluate the relationship, a systematic review and meta-analysis was performed [13]. From detailed analyses, 9.66% of psoriasis cases showed high risk for advancing liver fibrosis, while 77.79% showed low risk. When cases are aged >50 years, have diabetes, obesity, dyslipidemia, hypertension, and/or metabolic syndrome (Met-S), they have an increased risk of developing liver fibrosis.

Vitamin B₁₂ (cobalamin) is a cofactor for the enzyme that transfers the carbon group from tetrahydrofolate [14]. Deficiency in either B₁₂ or folate may disrupt the division of erythrocytes to their normal size. Then, erythrocytes discontinue dividing due to deficient pyrimidines, leading to enlarged cells. A recent report showed that higher MCV may contribute to venous thromboembolic disease by some related mechanisms [15].

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Concerning ALD, AST/ALT ratio has played a crucial role in the diagnosis. When AST/ALT ratio becomes more than 2:1, acute liver disease (ALD) may classically present. For its mechanism, alcohol-induced deficiency of vitamin B₆ (pyridoxine) leads to low ALT, while mitochondrial damage may increase AST preferentially [16].

Some limitations may exist in this report. This case has several problems such as alcohol consumption, elevated AST/ALT ratio, increased MCV, psoriasis, and others. In such situations, the case will be carefully followed up with several routine biomarkers, such as GGT, AST/ALT ratio, bilirubin, MCV, and Prothrombin Time-International Normalized Ratio (PT-INR) [16].

In summary, this report showed a 54-year-old female with several problems and perspectives among them. Excessive alcohol consumption for years has developed several unbeneficial situations. It is required that she be treated with adequate advice on daily habitual lifestyle by a medical team of various staff.

Conflict of Interest

The authors have read and approved the final version of the manuscript. The authors have no conflicts of interest to declare.

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References

- [1] Mirowski K, Balicka-Ślusarczyk B, Hydzik P, Zwolińska-Wcisło M. Alcohol-associated liver disease - a current overview. *Folia Med Cracov*. 2024 Sep 15;64(2):93-104. [PMID: 39324682]
- [2] Hernández-Évole H, Jiménez-Esquível N, Pose E, Bataller R. Alcohol-associated liver disease: Epidemiology and management. *Ann Hepatol*. 2024 Jan-Feb;29(1):101162. [PMID: 37832648]
- [3] Harris JC, Leggio L, Farokhnia M. Blood Biomarkers of Alcohol Use: A Scoping Review. *Curr Addict Rep*. 2021 Dec;8(4):500-508. [PMID: 37274945]
- [4] Israelsen M, Rungratanawanich W, Thiele M, Liangpunsakul S. Non-invasive tests for alcohol-associated liver disease. *Hepatology*. 2024 Dec

1;80(6):1390-407. [PMID: 38607723]

[5] Kaferle J, Strzoda CE. Evaluation of macrocytosis. *Am Fam Physician*. 2009 Feb 1;79(3):203-208. [PMID: 19202968]

[6] Chiang MH, Yang CY, Kuo YJ, Cheng CY, Huang SW, Chen YP. Inverse Relationship between Mean Corpuscular Volume and T-Score in Chronic Dialysis Patients. *Medicina (Kaunas)*. 2022 Mar 30;58(4):497. [PMID: 35454336]

[7] Bando H, Wood M, Ebe K. The Latest topics of Standards of Care in Diabetes 2025: Focusing on GLP-1RA. *Asp Biomed Clin Case Rep*. 2024 Dec 31;8(1):34-37.

[8] General Assembly of the World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *J Am Coll Dent*. 2014 Summer;81(3):14-18. [PMID: 25951678]

[9] Lai X, Chen H, Dong X, Zhou G, Liang D, Xu F, Liu H, Luo Y, Liu H, Wan S. AST to ALT ratio as a prospective risk predictor for liver cirrhosis in patients with chronic HBV infection. *Eur J Gastroenterol Hepatol*. 2024 Mar 1;36(3):338-44. [PMID: 38251454]

[10] Manish A, Bharosay A, Negi K, Srivastava R. TG: HDL, AST: ALT, A:G Ratios in Alcoholic and Non-alcoholic Fatty Liver patients. *Journal of Research in Applied and Basic Medical Sciences* 2024; 10 (3) :279-84.

[11] Xuan Y, Wu D, Zhang Q, Yu Z, Yu J, Zhou D. Elevated ALT/AST ratio as a marker for NAFLD risk and severity: insights from a cross-sectional analysis in the United States. *Front Endocrinol (Lausanne)*. 2024 Aug 26;15:1457598. [PMID: 39253584]

[12] Choi J, Han I, Min J, Yun J, Kim BS, Shin K, Kim K, Kim YH. Dose-response analysis between alcohol consumption and psoriasis: A systematic review and meta-analysis. *J Dtsch Dermatol Ges*. 2024 May;22(5):641-52. [PMID: 38679782]

[13] Yongpisarn T, Namasondhi A, Iamsumang W, Rattanakaemakorn P, Suchonwanit P. Liver fibrosis prevalence and risk factors in patients with psoriasis: A systematic review and meta-analysis. *Front Med (Lausanne)*. 2022 Dec 15;9:1068157. [PMID: 36590962]

[14] Maner BS, Killeen RB, Moosavi L. Mean Corpuscular Volume. 2024 Jul 27. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing;

Case Report

2025 Jan-. [PMID: 31424859]

[15] Xu SL, Li K, Cao WW, Chen SH, Ren SB, Zhang BF, Zhang YM. The association between admission mean corpuscular volume and preoperative deep venous thrombosis in geriatrics hip fracture: a retrospective study. *BMC Musculoskelet Disord.* 2024 Jan 8;25(1):40.

[PMID: 38191314]

[16] Baruah SM. Biomarkers in Alcoholic Liver Disease. *Assam Journal of Internal Medicine* Jan-Jun 2025;15(1):p 1-2.

