CASE REPORT

Indigenous Herbal Drug (Tinospora Cordifolia) Induced Liver Injury: A Case Report

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Abstract

Drug-induced liver injury (DILI) is a condition characterized by acute or chronic liver damage following the use of hepatotoxic drugs. It can be classified based on clinical presentation (hepatocellular, cholestasis, or mixed), mechanism of hepatotoxicity, or histological appearance. Drug-induced liver injury also includes cases related to herbal-induced liver injury (HILI). Diagnosing DILI requires excluding other potential causes and identifying a consistent pattern of liver involvement. The pathogenesis typically involves the parent drug or its metabolites, which may directly impact cell biochemistry or trigger an immune response. The specific drug involved influences the pattern of liver function abnormalities, the latency period before symptom onset, the presence of immune-mediated hypersensitivity, and the response to drug discontinuation. The case discussed illustrates a DILI caused by an indigenous herbal drug, highlighting the complexities of identifying and managing liver injury in such scenarios.

Keywords: Case report, Drug induced liver injury, Giloy, Herbal induced liver injury, Tinospora cordifolia.

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Introduction

Drug-induced liver injury (DILI) is an acute or chronic liver injury following the use of a hepatotoxic drug. DILI can be classified based on clinical presentation (hepatocellular, cholestasis, or mixed), mechanism of hepatotoxicity, or histological appearance from a liver biopsy. Herbal and dietary supplements, including green tea extract, anabolic steroids, and multi-ingredient nutritional supplements, account for 16.1% of DILI. Histopathology findings include acute or chronic Hepatocellular injury, acute or chronic cholestasis, steatosis, zonal necrosis,[1] etc. This case, discussed below, is an example of a DILI caused by an indigenous herbal drug. It can also be classified as a herbal-induced drug injury (HILI).

Case Description

A 30-year-old female came with complaint of upper quadrant pain with anorexia, nausea, vomiting for 20 days. Patient also gave history of yellowish discoloration (Fig. 1) of eye for same duration associated with high colored urine. There was no history of any fever, any addiction, use of any hepatotoxic drug, any blood transfusion, any chronic comorbidity. On examination there was no organomegaly, palpable abdominal mass, any lymphadenopathy, any neurological abnormalities, any skin pigmentation.

Initial evaluation revealed that the patient had conjugated hyperbilirubinemia (19.7). Transaminitis was not significant with respect to hyperbilirubinemia.[2] Her INR was 1.3 and albumin was 3.3 gm/dL. Hepatic virus panel was negative. Wilson and hemochromatosis screening were also negative. ANA and autoimmune hepatitis markers were also negative (Tables 1 and 2). Other blood parameters revealed no significant abnormality, except hypertriglyceridemia.

So, a further detailed history was taken, and it revealed that the patient took an "Immune system booster" indigenous drug that contained Giloy extract (Tinospora Cordifolia) for around 1 year.[3] This raised a suspicion of a probable case of liver injury due to this agent.[4,5] The *R*-value was 1.4, suggesting cholestatic pattern. So, USG and MRCP was done to rule out any obstruction in biliary tree, and it revealed no significant abnormality. Finally, a USG guided liver biopsy was done and sent for histopathology.

Liver biopsy revealed portal areas slightly expanded with the presence of mild to moderate inflammation consisting of neutrophils, lymphocytes and some eosinophils. There is evidence

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Patient consent statement: The author(s) have obtained written informed consent from the patient for publication of the case report details and related images.

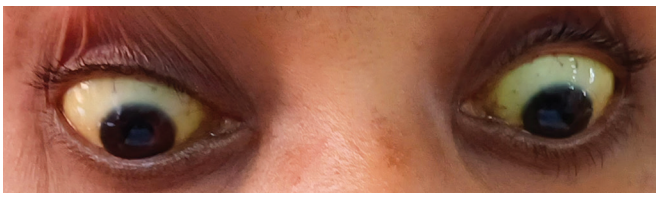

Fig. 1: Icterus in the patient

Table 1: Investigations done for evaluation of hyperbilirubinemia

Liver function test	*Day 1*	*Day 8*	*Day 14*
Total bilirubin	22.8 mg/dL	23.5 mg/dL	18.6 mg/dL
Conjugated bilirubin	19.7 mg/dL	20.8 mg/dL	16.3 mg/dL
Unconjugated bilirubin	3.1 mg/dL	2.7 mg/dL	2.3 mg/dL
ALT	72 unit/dL	72 unit/dL	79 unit/dL
AST	144 unit/dL	148 unit/dL	142 unit/dL
ALP	158 unit/dL	167 unit/dL	152 unit/dL
Albumin	3.3 gm/dL	4.0 gm/dL	3.5 gm/dL
Globulin	4.0 gm/dL	4.9 gm/dL	4.4 gm/dL
Viral serology panel		*Autoimmune and metabolic*	
IgM anti HAV	Non-reactive	ANA	Negative
IgM anti HCV	Non-reactive	Anti-liver kidney microsomal antibody, ASMA	Negative
HBsAg	Non-reactive	Ferritin	98 ng/mL
IgM anti HEV	Non-reactive	Ceruloplasmin	34.9 mg/dL

Table 2: List of other blood parameters

Sodium	138 mmol/dL
Potassium	3.8 mmol/dL
Urea	10 mg/dL
Creatinine	0.6 mg/dL
INR	1.36
Hemoglobin	10.6 gm/dL
Total leukocyte count	9,600/cumm
Platelet	244,000/cumm
Triglyceride	308 mg/dL
Cholesterol	86 mg/dL
HDL	11 mg/dL
LDL	13 mg/dL
VLDL	2 mg/dL

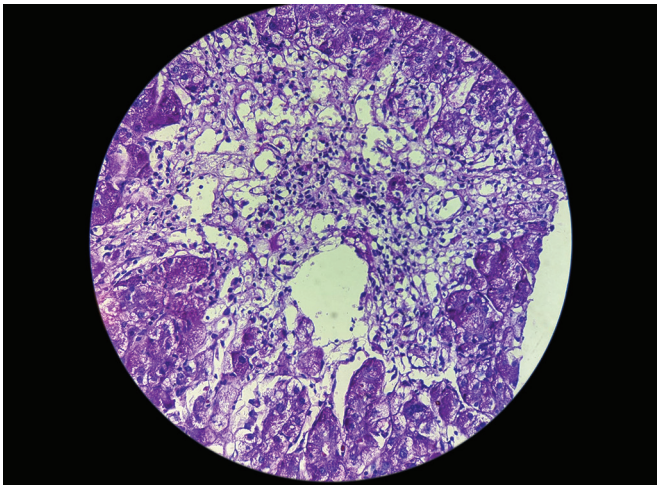

Fig. 2: Infiltration of lymphocytes, neutrophils, and some eosinophils around porta

of interface hepatitis. Bilirubin stasis present (Fig. 2). Focal cholate stasis is seen in periportal hepatocytes (Fig. 3). The occasional

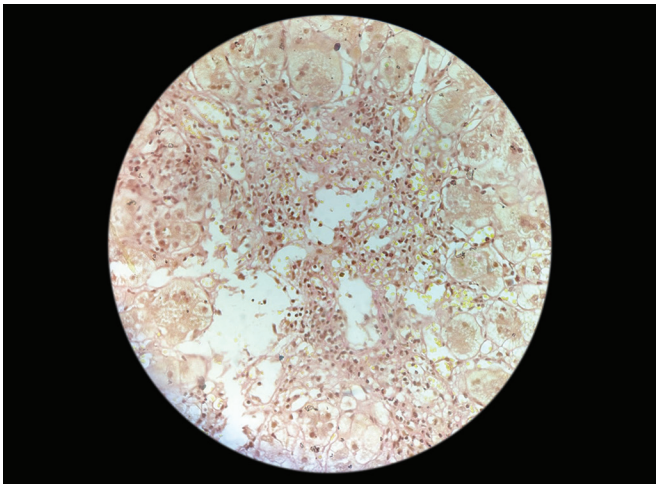

Fig. 3: Bilirubinostasis and focal cholate stasis

Table 3: Follow-up liver function tests of the patient over 6 months

Liver function parameters	*On admission*	*1 month after stopping drug*	*3 months after stopping drug*	*6 months after stopping drug*
Total bilirubin (mg/dL)	22.8	10.6	2.6	1.5
Conjugated bilirubin (mg/dL)	19.7	8.9	1.5	0.7
Unconjugated bilirubin (mg/dL)	3.1	1.7	1.1	0.8
ALT (units/L)	72	49	48	38
AST (units/L)	144	54	47	41
ALP (units/L)	158	106	66	77
Total protein (gm/dL)	7.3	7.5	8.0	7.8
Albumin (gm/dL)	3.3	3.6	4.5	4.6
Globulin (gm/dL)	4.0	3.9	3.5	3.2

focus of lytic necrosis of hepatocytes (spotty necrosis) is present. No increase in iron is seen in the section examined. No steatosis or specific granuloma is seen in the section examined. No fibrosis or cirrhotic changes are seen in the section examined. In the end, the diagnosis was chronic incomplete cholestasis with chronic active hepatitis, more likely to be drug induced.[6,7]

Results

The patient was advised to stop the drug and followed up after discharge. Patients' Bilirubin level was monitored. The patient was given all supportive therapy, including prophylaxis for hepatic encephalopathy. The patient was followed up after 1, 3, and 6 months. Patients' bilirubin levels decreased significantly to a level of 10.6 mg/dL after 1 month, 2.6 mg/dL after 3 months and to 1.5 mg/dL after 6 months, thus retrospectively proving the diagnosis (Table 3).

R Value = (ALT ÷ ULN ALT) / (ALP ÷ ULN ALP)

The R value is interpreted as follows:
- >5: Hepatocellular injury
- >2 to <5: Mixed pattern
- <2: Cholestatic injury

ALT= Alanine Transaminase
ALP= Alkaline Phosphatase
ULN= Upper limit normal

Fig. 4: Significance of *R*-value

Discussion

In any case of a suspected drug induced liver injury, *R*-value plays a crucial role in determining the predominant pattern of liver injury (hepatocellular, cholestatic or mixed). The *R*-value is the ratio of alanine transaminase (ALT) of the patient is to the upper limit of normal ALT and the alkaline phosphatase (ALP) of the patient to the upper limit of ALP (Fig. 4).[8] It is suggestive of hepatocellular pattern if value is >5, cholestatic pattern if <2 and mixed if between 2 and 5. In our case it was 1.4 suggestive of cholestatic pattern, and it was proved by liver biopsy. If hepatocellular pathology is suspected we should rule out viral hepatitis, autoimmune hepatitis, alcoholic hepatitis, Wilson's disease, hemochromatosis, etc., and if cholestatic pattern is suspected then CT, MRCP should be considered. If none of the investigations is confirmatory, then liver biopsy should be considered.

In any case of liver injury or acute liver failure, drug history is particularly important, as there is often a chance of missing important drug exposure. In our case, the history of taking Giloy was not elicited in the initial attempt, and only after repeated inquiries did the patient reveal it.

Conclusion

People in India are unknowingly taking many indigenous medications, but without knowing their potential lethal side effects. Tinospora cordifolia (Giloy) is a herbal supplement commonly used in the Indian alternative medicine system. This herb has been promoted to the public in India as an immune booster. However, case reports have recently shown an association between Giloy use and the development of herb-induced liver injury (HILI). This case is an ideal example of such a complication.

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References

1. Francis P, Navarro VJ. Drug-Induced Hepatotoxicity. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2023. [online] Available from: https://www.statpearls.com/pharmacist/ce/activity/108826/?specialty=specialty. [Last accessed October, 2024].
2. Fargo MV, Grogan SP, Saguil A. Evaluation of jaundice in adults. Am Fam Physician 2017;95(3):164–168. PMID: 28145671.
3. Kapil A, Sharma S. Immunopotentiating compounds from Tinospora cordifolia. J Ethnopharmacol 1997;58(2):89–95. DOI: 10.1016/s0378-8741(97)00086-x.
4. Kulkarni AV, Hanchanale P, Prakash V, et al. Tinospora Cordifolia (Giloy)-induced liver injury during the COVID-19 pandemic-multicenter nationwide study from India. Hepatol Commun 2022;6(6):1289–1300. DOI: 10.1002/hep4.1904.
5. Payyappallimana U, Ravikumar K, Venkatasubramanian P. Can Guduchi (Tinospora cordifolia), a well-known ayurvedic hepato-protectant cause liver damage?. J Ayurveda Integr Med 2023;14(1):100658. DOI: 10.1016/j.jaim.2022.100658.
6. Kleiner DE, Chalasani NP, Lee WM, et al. Hepatic histological findings in suspected drug-induced liver injury: Systematic evaluation and clinical associations. Hepatology 2014;59(2):661–670. DOI: 10.1002/hep.26709.
7. Kleiner DE. Drug-induced liver injury: The hepatic pathologist's approach. Gastroenterol Clin North Am 2017;46(2):273–296. DOI: 10.1016/j.gtc.2017.01.004.
8. Fontana RJ, Bjornsson ES, Reddy R, et al. The evolving profile of idiosyncratic drug-induced liver injury. Clin Gastroenterol Hepatol 2023;21(8):2088–2099. DOI: 10.1016/j.cgh.2022.12.040.