CASE REPORT

Deranged liver function test after COVID 19 vaccination: A rare presentation with review of literature

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Abstract

Word Health Organization declared COVID 19 infection as pandemic in 2020. Since then different countries had started working on vaccination. After multiple trials different vaccinations got approved. The first vaccine to be received in Pakistan was Sinopharm and was provided to nearly all health care professionals on priority basis. The safety profile of different vaccines were satisfactory and there were very few side effects reported till date. We are reporting the first case in Pakistan where a female health care professional developed vaccination induced deranged liver function test with delayed but complete recovery. Extensive workup was done to rule out all other differentials of deranged liver function test.

Keyword: Vaccination, liver function test, COVID 19.

DOI: https://doi.org/10.47391/JPMA.6322
Submission completion date: 02-10-2022
Acceptance date: 02-03-2023

Introduction

COVID 19 was declared a pandemic by the World Health Organization in 2020.Time shows that this disease is multisystem in nature and can involve any system however, predominantly respiratory system is effected causing fever, cough and shortness of breath.[1] Limited options are available to treat the condition with only remdesivir approved by food and drug administration.[2] Due to its rapid spread, researchers and scientists started work on its prevention and formulation of a vaccine. Due to coordinated efforts the first vaccine came into market within a short span of one year. The vaccination has a good safety profile with few documented side effects noted like fever, headache, arthralgia, myalgia and pain at injection site.[3]

Drug induced liver function derangement is commonly seen in our population in routine medical practice. Common drugs which can cause derangement in liver function test include acetaminophen, nonsteroidal anti-inflammatory drugs, isoniazid and rifampicin. The other common cause of deranged liver function test are Autoimmune hepatitis, Non alcoholic fatty liver disease, hepatitis A,B,C and E.[4] The first vaccine to be received in Pakistan was Sinopharm and almost every health care professional received the vaccine on priority basis. We report a case of deranged liver function test after COVID 19 vaccination. No case till date has been reported of deranged LFT after COVID 19 vaccination in Pakistan. The purpose of reporting this case is to highlight a rare side effect of COVID vaccine. This will create awareness in the physicians for making an early diagnosis and implement effective management.

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Case Report

The case was first seen in the emergency department of Dow University of Health Sciences Ojha campus, Karachi in August 2021.The consent of the patient was taken prior to manuscript writing. The patient was a female of 30 years age, married health care professional of Karachi, Pakistan with no known comorbids. She was admitted to the emergency department on 31 August 2021 with the complaint of continuous high grade fever and dark yellow coloured urine for the past 4 days. She was in her usual state of health 6 days back. She denied the history of shortness of breath, cough, pale stool, weight loss, loss of taste sensation, pruritis and history of recent travel. She was tested positive for COVID-19 in 1st week of August 2021.The course of COVID was asymptomatic and uneventful. She tested COVID negative after 14 days and was advised for COVID vaccination. She received the 1st dose of COVID vaccination on 25/8/2021.According to the patient her symptoms started on day 3 post vaccination and was getting worse with time.

On examination the patient was a young female with average height and built, conscious, well oriented with time place and person having GCS of 15/15 maintaining blood pressure and saturation. Temperature was 101^{O}F. On General physical examination, the patient was jaundiced with no anaemia, clubbing or koilonychia noted. Kayser–Fleischer ring was absent. Rest of the systemic examination was also unremarkable.

Haematological investigations showed haemoglobin of 11g/dL, WBC of 10×10^9/L and platelet count of 153×10^9/L.

Table-1: Step wise changes in LFT(Liver function test).

Liver function test	30/8/2021	3/9/2021	5/9/2021	10/9/21	28/9/21	Normal reference value
Total.Bilirubin (mg/dL)	1.14	3.12	1.54	1.03	1.00	0-1
Direct.Bilirubin (mg/dL)	0.64	2.06	0.95	0.55	0.5	0-0.35
SGPT (IU/L)	532	385	323	150	35	5-45
SGOT(IU/L)	598	321	190	51	32	5-35
Alkphosphate (U/L)	257	334	351	362	98	50-136
GGT (U/L)	475	395	447	608	55	5-30

SGPT: serum glutamate pyruvate transaminase; SGOT: serum glutamic-oxaloacetic transaminase; GGT: gamma-glutamyl transferase.

Table-2: Workup for dearranged LFT (Liver Function test).

Test	Result	Test	Result
Dengue antigen	Negative	Hepatitis B c IgM	Non reactive
Malarial parasite	Negative	HepBsAg and HBeAg	Non reactive
Ebv	Non reactive	Anti HCV and HCV RNA Qualitative	Non reactive
Hepatitis A antibody	Non reactive	ANA Profile	negative
Hepatitis E antibody	Non reactive	Serum amylase	normal

EBV: Epstein-Barr virus; HCV: hepatitis C virus; ANA: Antinuclear Antibody.

urea, creatinine electrolytes, PT/APTT/INR were in normal ranges. CRP was 18, procalcitonin was normal and blood culture showed no bacterial growth. The LFT pattern is displayed in Table 1. The work up to exclude other causes of deranged LFT is depicted in Table 2. The history is not suggestive of autoimmune hepatitis. Serum gamma globulin was in the normal range. Also ANA profile and anti Smooth muscle antibody was negative. Anti -LKM1 antibody was not tested. Kayser–Fleischer ring was absent and there was no neurological finding. The patient refused to have 24 hour urinary copper estimated. The ultrasound of abdomen showed decrease parenchymal echogenicity with rest of the examination being unremarkable. High Resolution computed tomography finding was consistent with previous COVID infection. The patient was treated symptomatically with hydration, purgation, nebulization and serial monitoring of LFTs. She became afebrile on day 6 of admission. The SGPT/SGOT showed improvement and patient was discharged on 10th day with close follow up in out- patients department (OPD). She came to the opd in last week of September 2021 with normal LFTs. However symptoms of anorexia and lethargy were present for which symptomatic treatment and counselling was done. The patient was sent to the infectious disease clinic to take the opinion on second dose of vaccination. Considering the risk vs benefit ratio they advised for second dose to complete vaccination and also the booster dose after 6 months. However the patient family was reluctant for receiving the second dose of vaccination.

Discussion

Infectious disease, noninfectious disease, and autoimmune hepatitis are the main cause of derangement of liver function test. Drug induced liver injuries also cause wide spectrum of derangement. The presentation varies from incidental asymptomatic to acute liver failure with encephalopathy.[5] The most common offending drug is acetaminophen, NSAID and isoniazid. In our case we discovered the cause of deranged LFTs to be the COVID vaccine. Luckily in our patient the course of illness was not severe and the patient recovered completely in a period of two months.

While reviewing literature we found three reported cases of patients with hepatic failure after receiving Pfizer /bio N tech mRNA vaccines in UK in September 2020. A 14 year old female developed hepatotoxicity after COVID 19 vaccination. Two case reports (one of female and one male) also documented triggering of autoimmune hepatitis after receiving COVID 19 vaccination.[7] Another female, 61 years of age presented in OPD with raised Alkaline phosphate of 207 u/L and total bilirubin of 6.2 mg/dL with direct bilirubin of 3.9 after the second dose of Pfizer vaccine.[7] No case of derangement in LFTs has been documented in Pakistan till date.

The result of the study carried out on side effect of Sinopharm vaccination showed that 24.4% did not have any side effects while 42% experienced pain at injection site, fatigue was reported in 12.2%and headache in 9.6%. No case of liver function test derangement or acute liver failure was noted in this study contrary to our patient who had received Sinopharm. In literature review we observed that females were more likely to have side effects than males.[8]

Conclusion

We conclude that this is a very rare presentation of hepatic derangement following COVID 19 vaccination. One should be aware of the possibility. However, it is diagnosis of exclusion and work up has to be done before concluding it as vaccination induced dearranged liver function test just as we did it in our case. This emphasize monitoring of liver function test after COVID vaccination.

Recommendations: Physicians should be aware of atypical side effects of COVID vaccination. The signs and symptoms after vaccination should be observed closely and necessary investigations carried out for detecting any liver damage.

Disclaimer: None.

Conflict of interest: None.

Funding disclosure: None.

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