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IMMUNOLOGICAL STUDY OF HEPATITIS C: A CASE STUDY

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Abstract

This case study has been designed to report an incident of Hepatitis C in a 45 years old female patient, brought to a local hospital in Rawalpindi, who had been experiencing serious symptoms associated with Hepatitis C for the past 4 months. Complete chronological history of patient was taken including her past medication history by direct interview of her daughter. Her SGPT\ALT level, liver biopsy, ultrasound ,PCR, ELISA, Amplification of cyclic DNA in two rounds of (Nested PCR) Agarose gel electrophoresis and Gel analysis tests were taken. These test studies revealed that she had Hepatitis C in chronic stage.

Key words: Hepatitis C patient, Chronic Hepatitis C diagnosed.

Introduction

Globally, hepatitis C virus (HCV) has infected about 130 million people, most of them are chronically infected. These infected peoples are reservoir for transmission to others and are at risk for developing chronic liver cirrhosis, and primary hepatocellular carcinoma. It is estimated that HCV accounts for 27% of cirrhosis and 25% of HCC worldwide. HepatitisC is characterized by damage to liver caused by the hepatitis C virus (HCV).The infection is often asymptomatic, but chronic infection can lead to scarring of the liver and ultimately to cirrhosis, which is generally apparent after many years. In some cases, those with cirrhosis will go on to develop liver failure, liver cancer, or life-threatening esophageal and gastric varices. HCV is spread primarily by blood-to-blood contact associated with intravenous drug use, poorly sterilized medical equipment, and transfusions.Symptoms are generally mild and vague, including a decreased appetite, fatigue, nausea, muscle or joint pains, and weight loss and rarely does acute liver failure result. Most cases of acute infection are not associated with jaundice. Following an acute infection, almost all patients develop a vigorous antibody and cell-mediated immune response that fails to clear the infection but may contribute to progressive liver damage. Persistent viremia is accompanied by variable degrees of hepatic inflammation and fibrosis over time. Recent studies suggest that 50% or more of hepatocytes may be infected with hepatitis C virus (HCV). Persistent infection appears to be due to weak CD4+ and CD8+ T-cell responses during acute infection, which fail to control viral replication. Acute HCV infection is characterized by co-infection with multiple viral subtypes representing highly diverse intra-patient genetic variability.

Case presentation

The patient is a 45years old female named Mrs. Zeenat Qamar d/o Nasir Hassan. She originally is a resident of Chakwal and she has been working in a local primary school as a senior teacher for last 7 years. Two months ago she came to know that she was experiencing fatigue,jointpain,weight loss, loss of appetite and hence she went to a local hospital and was diagnosed to have jaundice and was prescribed Phenobarbital oral and Luminal injection,but the symptoms worsened.She decided to change her physician and went to Bilal Hospital in Rawalpindi,where she was asked to undergo tests like Liver biopsy,ultra-sound,PCR,ELISA and was diagnosed to have Hepatitis C in chronic stages.

The tests conducted by the doctor for diagnosis are as follow

HCV SC REAL TIME

HCV Sc real time test was conducted on patient serum, the result of which indicated the presence of HCV. The viral load in serum is 853847IU/ml (figure 1).

HCV GENOTYPING

It is important to find out which hepatitis C genotype patient has, because it determines both the type of treatment, and the length of treatment; HCV genotype also helps to predict the likelihood of curing HCV. Test results of the patient indicates 3a type (figure 2).

HCV ANTIBODY TEST (ELISA)

Elisa test result is positive which shows the presence of antibodies against HCV (figure 3).

ABDOMEN ULTRASOUND:

Abdominal ultrasound shows Liver in normal size,show coarse echogenicity with irregular outline.Peri-hepatic fluid collection seen. No focal lesion seen.Portal vein measures 1.3cms.No dilated hepato-biliary channels seen.IVC and hepatic vein normal. Sapleen is normal in size and texture,no focal defect seen. Both kidneys smaller in size,smooth contour and show increased parenchymal echogenicity,No stone mass and evidence of hydro-nephrouretur on either side. Pancrease is normal in size and texture, no edema is seen,pancreatic duct is not dilated. Other diagnosis includes no pleural effusion or lymphoedenopathy but moderate amount of ascites seen.

INTERPRETATION OF DIAGNOSTIC TESTS:

HCV Antibody test, HCV Genotyping,increased parenchymal echogenicity in kidneys and viral load noted during PCR test shows that the patient is suffering from chronic Hepatitis C.

Discussion

Due to exposure to HCV patient developed symptoms of jaundice,joint pain, weight gain, GIT disturbance. Physician prescribed her Phenobarbitol and Acetaminophen, but state of disease worsened,so physician was changed and patient was rightly diagnosed. Patient has presented with classic signs and symptoms of chronic hepatitis. Laboratory results confirm the diagnosis of chronic hepatitis C infection.

Because chronic viral hepatitis is usually a self-limited disease and Patient is alert with no evidence of coagulopathy, she can probably be treated as an outpatient. Liver enzymes and PT should be monitored every 5 to 7 days until liver enzymes return to normal level. Bed rest is not indicated, but the patient was asked to avoid strenuous activity. She was advised to eat a well-balanced diet and abstain from smoking for the duration of the illness. Because acetaminophen can be toxic to the liver, ibuprofen would be a better alternative for controlling fever. No other alterations in the patient's medications are necessary at this point. If nausea precludes the patient from ingesting food and fluids, IV replacement of fluids and electrolytes may be necessary. In the event the patient develops bleeding tendencies or signs of encephalopathy, she should immediately be taken to the hospital or her physician's office.A single dose of HAV immunoglobulin is recommended for close contacts. If immunoglobulin is not available, administration of hepatitis A vaccine may prevent illness or lessen the severity of the contact's symptoms if infection does occur.

RECOMMENDATIONS

1. Physicians must obtain an appropriate patient and family history to assist them in recognizing symptoms of Hepatitis C.
2. Methadone treatment programs, needle and syringe exchange programs, and comprehensive risk-modifying educational programs should be implemented to prevent HCV transmission.
3. Health-care providers must strive to balance the risk for infection against the potential toxicity of the agent(s) used when selecting a drug regimen for HCV PEP.
4. HCV-antibody testing should be performed for at least 6 months post exposure.
5. Direct virus assays for routine follow-up of HCP are not recommended.
6. HCV testing should be performed on any exposed person who has an illness compatible with an acute retroviral syndrome.
7. HCP exposed to HCV-infected blood should refrain from donating blood, plasma, organs, tissue, or semen.
8. Interferon is not recommended for use during pregnancy or breast-feeding.
9. Doctor should know of any over-the-counter or prescription medications patient is taking.
10. Laboratory tests should be done on a regular basis to be sure the drug is working correctly and to watch for possible side effects.
11. Each dose should be taken at a scheduled time. If a dose is missed, doctor should be contacted to establish a new schedule.
12. The dose should not be doubled to make up for what the patient missed.
13. The prospect of known or suspected resistance of the source virus to antiretroviral agents, particularly to agents that might be included in a PEP regimen should be considered.

Conclusion

Hepatitis C is an asymptomatic disease and symptoms don't develop until liver damage occur.It takes several years for the diagnosis of disease.Main treatment is injection of interferon which enhance body defense system.The patient was treated by taking Interferon and Sovaldi and 80% recovery rate was observed.The treatment is ongoing and the patient was advised to take post-exposure precautionary measures related to HCV.

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Table 1. HCV SC real time test

TEST	HCV RNA Quantitative
RESULT	HCV RNA DETECTED
VIRAL LOAD	853847 IU/ml

Table 2. HCV Genotyping test

TEST	HCV Genotyping
RESULT	3a

Table 3. HCV Anti-body test (ELISA)

TEST PERFORMED	HCV Antibody Testing
RESULT	POSITIVE

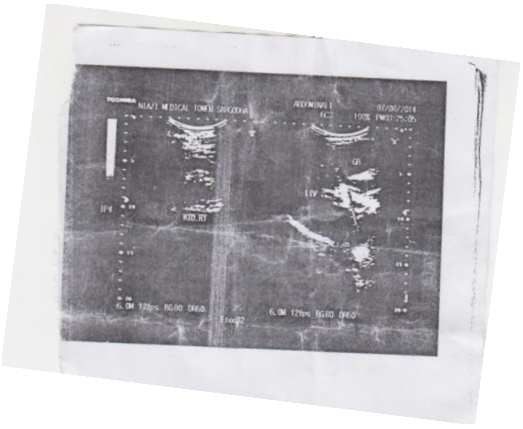

Figure 1. Abdominal Ultrasound

Table 4. Interpretation of ultrasound

LIVER	Normal in size,show coarse echogenicity with irregular outline.Peri-hepatic fluid collection seen.No focal lesion seen.Portal vein measures 1.3cms.No dilated hepato-biliary channels seen.IVC and hepatic vein normal
SPLEEN	Normal in size and texture,no focal defect seen
KIDNEY	Both kidneys smaller in size,smooth contour and show increased parenchymal echogenicity,No stone mass and evidence of hydro-nephrouretur on either side.
GALL BLADDER	Thick walled,no calculus is seen,no pericholecystic fluid collection is seen .CBD is not dilated.
PANCREAS	Normal in size and texture, no edema is seen,pancreatic duct is not dilated
URINARY BLADDER	Wall thickness normal,no calculas mass is seen
OTHERS: 1)No pleural effusion or lymphoedenopathy seen. 2)Moderate amount of ascites seen	

Table 5. Blood test

TEST	RESULT	UNIT	REF. RANGE
Hb	12.1	g/dL	12-15(F)
TLC	5800	/ul	40000-11000
RBC	4.46	Mil/ul	4.5-5.5
Platelets	281000	/uL	150000-400000
HCT	39,3	%	38-47(F)
MCV	88.1	fl	80-98
MCH	27.1	pg	27-32
MCHC	30.8	g/dl	31.5-34.5
Neutrophils	40	%	40-75
Lymphocytes	52	%	20-45
Monocytes	02	%	02-10
Eosinophils	06	%	01-06

Table 6. Medication prescribed at the time of diagnosis

Medication	Duration	Dosage	Interval
Tab.Sovaldi 400mg	24 weeks	1 tab.	Once daily
Ribavirin(Rebetol) 400mg	24 weeks	1 tab.	Once a day
Interferon (Referon A)	24 weeks	1 inj.	Thrice a week
Tab.Acetoaminophen(Tylenol) 325mg	2-3 weeks	1 tab.	Thrice a day
Phenobarbitol 120mg	2 weeks	1 tab.	Thrice a day