

To Study the Spectrum of Haematological Findings in HCV Positive Patients Based on CBC, PBF and Bone Marrow Findings

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Abstract

Background: Most HCV infected cases are subclinical, leading to eventual chronic liver disease that can lead to chronic inflammation of the liver and progressive fibrosis and cirrhosis. The present study was conducted to assess spectrum of haematological findings in HCV positive patients based on complete blood counts, peripheral blood film findings and bone marrow studies. **Material and Methods:** Total of 100 cases were included in the study. CBC determines if there is any increase or decrease in your blood cell counts. Normal values vary depending on your age and gender. The test measures the three basic types of blood cells. Red blood cells (RBC's), White blood cells (WBC's) and Platelets. Preparation of a peripheral blood smear with direct finger prick method. Bone marrow aspiration was done by salah's bone marrow puncture needle. the preferred site was posterior superior iliac spine. **Results:** The most common finding seen in CBC and PBF was thrombocytopenia which was seen in 54 patients (54%) followed by leucopenia (53%) and anemia in 40 patients (40%). Among neoplastic findings on peripheral blood film and bone marrow examination, 2 patients (2%) were diagnosed with acute leukemia with blast percentage of >30%. 2% patients with multiple myeloma were showing rouleaux formation on PBF and plasmacytosis in bone marrow aspiration, 1 was diagnosed as idiopathic myelofibrosis which showed tear drop cells in PBF and dry tap on bone marrow aspiration and 1 patient (1%) was diagnosed with myelodysplastic syndrome. **Conclusion:** Thrombocytopenia, leucopenia and anemia are most common findings seen in HCV positive patients. Peripheral blood film findings along with clinical examination help to plan investigations and give important diagnostic clues.

Keywords: Anemia, Leucopenia, hepatitis C virus.

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Introduction

The hepatitis C virus (HCV) is a linear, single-stranded RNA virus of the Flaviviridae family that was identified in 1989 and is recognized as the major causal agent of non-A, non-B hepatitis. HCV is essentially a hepatotropic virus, and infection caused by the virus evolves towards a chronic state in approximately 85% of patients as demonstrated by the persistence of HCV-RNA in serum.^[1] Hepatitis C virus infection is strongly associated with health inequity; in low- and middle-income countries, infection with HCV is most commonly associated with unsafe injection practices and procedures such as renal dialysis and unscreened blood transfusions.^[2]

Most HCV infected cases are subclinical, leading to eventual chronic liver disease that can lead to chronic inflammation of the liver and progressive fibrosis and cirrhosis. Further, 25% of patients can develop hepatocellular carcinoma.^[3] HCV screening has several potential benefits. By detecting HCV infection early, antiviral treatment can be offered earlier in the course of the disease which is more effective than starting at a later stage. Further, early detection together with counselling and lifestyle modifications may reduce the risk of transmission of HCV infection to other people.^[4]

Diagnosing HCV infections requires serologic testing followed by Nucleic Acid Amplification Test (NAAT) to confirm the presence of chronic infection. Assessment for treatment requires nucleic acid amplification test to measure HCV viral load and to determine HCV genotype. Thrombocytopenia in chronic HCV infection is a major problem, particularly in patients with advanced liver disease. The risk of serious bleeding with severe thrombocytopenia can prevent invasive procedures including biopsies for staging.^[5] The present study was conducted to assess spectrum of haematological findings in HCV positive patients based on complete blood counts, peripheral blood film findings and bone marrow studies.

Materials and Methods

The study was conducted in department of pathology, Government Medical College, Patiala. All the specimens of blood and bone marrow aspiration submitted for CBC, PBF and bone marrow studies was included in the material to study. The relevant data of patient was recorded in the pre designed performa. Total of 100 cases were included in the study. The objectives and importance of this study was explained to the patients enrolled.

CBC determines if there is any increase or decrease in your blood cell counts. Normal values vary depending on your age and gender. The test measures the three basic types of blood cells. Red blood cells (RBC's), White blood cells (WBC's) and Platelets. The blood cell count was performed in hematology lab of Rajindra hospital Patiala. CBC was done on automated cell counter -3 part analyzer (sysmex).

Preparation of a peripheral blood smear with direct finger prick method. Blood was collected from the ante-cubital vein for various hematological and biochemical investigations. A drop of blood was taken from the same syringe and placed on a clean glass slide 1 cm from the end. Another slide with a smooth edge (spreader) was taken and the edge was placed over the drop so that the blood spread along the edge. The spreader was kept at approximately 30 to 40 degree angle and a smear was made with forward movement of spreader. About 2.5 to 3.5cm length tongue shaped smears were made. Bone marrow aspiration was done by salah's bone marrow puncture needle. the preferred site was posterior superior iliac spine. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table 1: Age wise distribution of patients

Age (years)	No. of patients	Percentage (%)
≤20	4	4
21-30	10	10
31-40	30	30
41-50	26	26
51-60	19	19
61-70	8	8
71-80	3	3
Total	100	100
Mean	43.26±13.25021	

In the present study, 30 patients (30%) were in the age group of 31-40 years followed by 26 patients (26%) in the range of 41-50 years, 19 patients in the range of 51-60 years, 10 patients (10%) on the range of 21-30 years, 8 patients (8%) in the range of 61-70 years, 4 patients (4%) in the range of <20 years and 3 (3%) in the range of 71-80 years.

Table 2: Gender wise distribution of patients

Gender	No. of patients	Percentage (%)
Male	36	36
Female	64	64
Total	100	100

In present study there were 36 males (36%) and 64 females (64%) out of total 100 patients showing female preponderance.

Table 3: Clinical presentation

Clinical findings	No. of patients	Percentage (%)
Pallor	29	29
Fever	20	20
Weakness	25	25
Bleeding	5	5
Splenomegaly	22	22
Hepatomegaly	10	10
Lymphadenopathy	4	4
Bone pains	2	2

The most common clinical feature seen was pallor which was observed in 29 patients (29%) followed by generalised weakness in 25% and splenomegaly in 22% patients. Fever was seen in 20% of patients, hepatomegaly in 10%, bleeding in 5%, lymphadenopathy in 4% and bone pains in 2% of patients who were diagnosed with multiple myeloma.

Table 4: Various findings on CBC, bone marrow and PBF in HCV positive patients

Findings	No. of patients	Percentage (%)
Thrombocytopenia	54	54
Leucopenia	53	53
Anemia	40	40
Acute leukemia	2	2
Multiple myeloma	2	2
Idiopathic myelofibrosis	1	1
Myelodysplastic syndrome	1	1

In the present study on 100 HCV positive patients, most common finding seen in CBC and PBF was thrombocytopenia which was seen in 54 patients (54%) followed by leucopenia (53%) and anemia in 40 patients (40%). Among neoplastic findings on peripheral blood film and bone marrow examination, 2 patients (2%) were diagnosed with acute leukemia with blast percentage of >30%. 2% patients with multiple myeloma were showing rouleaux formation on PBF and plasmacytosis in bone marrow aspiration, 1 was diagnosed as idiopathic myelofibrosis which showed tear drop cells in PBF and dry tap on bone marrow aspiration and 1 patient (1%) was diagnosed with myelodysplastic syndrome.

Discussion

Chronic infection with HCV is recognized as a multisystem disease since several extrahepatic alterations have been reported in association with HCV infection. Hematological manifestations in HCV infection can range from benign cytopenias to malignant disorders. Several extrahepatic manifestations have been reported in the natural history of HCV infection. Upto 40–74% of patients infected with HCV might develop at least one extrahepatic manifestation during the course of their disease. Rates of disease progression among individuals with chronic HCV infection vary; however, older age at time of infection, chronic alcoholism, and co-infection with HIV or hepatitis B virus appear to be correlated with more rapid progression. In general, the appearance of extrahepatic manifestations of HCV infection is unpredictable, that is, independent of the stage of the liver disease.^[6] A clear association with chronic hepatitis C has been established for many of these conditions. The course of chronic hepatitis C virus infection is often asymptomatic at onset; If becomes symptomatic extrahepatic complications may dominate. HCV may infect other cells outside of the liver, most extrahepatic manifestations are thought to be secondary to the host immune response to the viral infection and not a direct viral cytopathic effect.^[7]

A complete blood count (CBC) is one of the most commonly performed blood tests. Since it reveals peripheral blood changes, the complete blood count is routinely performed in health examinations, even in asymptomatic patients.^[8] The present study analysed the clinical and hematological profile of total hundred cases of HCV positive patients. Patients were subjected to complete blood counts, peripheral blood film and bone marrow examination. Age, gender distribution, complete blood counts, peripheral blood film and bone marrow findings were compared with various studies.

We found that 30 patients (30%) were in the age group of 31-40 years followed by 26 patients (26%) in the range of 41-50 years, 19 patients in the range of 51-60 years, 10 patients (10%) on the range of 21-30 years, 8 patients (8%) in the range of 61-70 years, 4 patients (4%) in the range of <20 years and 3 (3%) in the range of 71-80 years. Strieff et al,^[9] consisted of 16,196 individuals aged 18 or older who had peripheral blood counts and data on HCV infection. Three hundred ninety of the 16,196 participants in the study sample (2.4%) were anti-HCV positive. Neutrophil counts less than $2.1 \times 10^9/L$ were found in 9% of anti-HCV-positive persons, platelet counts less than $175 \times 10^9/L$ were found in 13% of anti-HCV-positive persons. The median hemoglobin was 14.0 g/dL (range 5.0-19.6 g/dL) and 5% were less than 11.5 g/dL. No significant differences were noted in the hemoglobin distribution between anti-HCV- positive and negative National Health And Nutrition Examination Survey participants.^[10]

We observed that there were 36 males (36%) and 64 females (64%). The most common clinical feature seen was pallor which was observed in 29 patients (29%) followed by generalised weakness in 25% and splenomegaly in 22% patients. Fever was seen in 20% of patients, hepatomegaly in 10%, bleeding in 5%, lymphadenopathy in 4% and bone pains in 2% of patients who were diagnosed with multiple myeloma. Giannini et al,^[10] conducted a study in which platelet count, TPO serum levels, and spleen size were assessed in 25 untreated HCV- positive chronic hepatitis patients undergoing liver biopsy. Male-to-female ratio was 4:1. Ten patients had fibrosis scores ranging from 0 to 2 and 15 patients had scores ranging from 3 to 6, while the median necro-inflammatory score was 5. Mean serum albumin, bilirubin, and prothrombin activity were within the range of normal, as expected in patients with chronic hepatitis. Thrombocytopenia was observed in 11 patients (44%). Thirty-six percent of these patients had splenomegaly (i.e. spleen longitudinal diameter-12 cm), while this feature was present in 29% of patients with normal platelet count.

We found that most common finding seen in CBC and PBF was thrombocytopenia which was seen in 54 patients (54%) followed by leucopenia (53%) and anemia in 40 patients

(40%). Among neoplastic findings on peripheral blood film and bone marrow examination, 2 patients (2%) were diagnosed with acute leukemia with blast percentage of >30%. 2% patients with multiple myeloma were showing rouleaux formation on PBF and plasmacytosis in bone marrow aspiration, 1 was diagnosed as idiopathic myelofibrosis which showed tear drop cells in PBF and dry tap on bone marrow aspiration and 1 patient (1%) was diagnosed with myelodysplastic syndrome. Ramos et al analyzed the clinical characteristics of 35 HCV patients diagnosed with severe cytopenia. They identified the following cytopenias: Autoimmune hemolytic anemia (17 cases), severe thrombocytopenia (16 cases), aplastic anemia (2 cases), severe neutropenia (1 case), refractory sideroblastic anemia (1 case), and pure red cell aplasia (1 case). Three patients presented with 2 types of severe cytopenias simultaneously. Twenty-seven (77%) were female and 8 (23%) male, with a mean age at diagnosis of cytopenia of 51.7 years (range, 18–84 yr). Twenty-three (85%) of 27 patients showed simultaneous mild cytopenias.^[11]

Conclusion

Authors found that thrombocytopenia, leucopenia and anemia are most common findings seen in HCV positive patients. Peripheral blood film findings along with clinical examination help to plan investigations and give important diagnostic clues.

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