

BLOOD COMPLETE PICTURE EXAMINATION; A SURROGATE TEST FOR SCREENING HEPATITIS C VIRAL INFECTION

Kiran Tauseef Bukhari*, Humaira Zafar

Department of Pathology, Al-Nafees Medical College, Isra University Islamabad Campus, Islamabad, Pakistan

ABSTRACT

Hepatitis C viral (HCV) infection is amongst the serious health issues in Pakistan. The early case recognition and hence its management via interferon and anti-virals can be helpful to reduce the high morbidity and mortality rates from the said infection in Pakistan. Objective of this study was to assess the variation in different hematological parameters amongst the newly diagnosed Hepatitis C viral (HCV) patients by blood complete picture examination. A Descriptive study was carried out on randomly selected 182 patients at the Pathology Department of Al-Nafees Medical College and Hospital, Islamabad, Pakistan. A simple random sampling technique was adopted for this study. It was an open study and patients of age range between 18 to 40 years were included. An informed consent followed by a questionnaire filling was the important prerequisites of study in order to include or exclude the specific patient. The samples were finally analyzed by immune chromatographic test (ICT) for the detection of anti-HCV antibodies. The blood complete picture examination was carried out to assess the variation in hematological parameters. Out of the total 182 patients, 122 were found to be positive for anti-HCV antibodies presence. The results of current study had shown that 11.98 ± 0.003 gm/dl and 123 ± 0.001 mm³ were the mean values of hemoglobin (Hb) and platelets respectively. While 8.11 ± 0.001 mm³ was the mean value for TLC. It was concluded that thrombocytopenia is the most common feature observed in newly diagnosed HCV positive cases.

Keywords: Hepatitis C, Hemoglobin, Platelets, Total Leukocyte Count

INTRODUCTION

An endemic Hepatitis C viral infection (HCV) is now being considered as amongst the list of serious health issues in Pakistan. It is an important reason behind the high morbidity and mortality rates in our country (Memon et al., 2012). According to a published report, the prevalence of HCV in Pakistan is about 25% especially in cases of chronic liver disease (Bosan et al., 2010). In younger age groups the frequency of HCV is 2.1%. Amongst the cirrhotic patients the prevalence is about 10% (Aliet al., 2009).

Hepatitis C infection is usually asymptomatic or subclinical in presentation. However, the chronic stages of infection can lead to liver cirrhosis, hepato cellular carcinoma esophageal/gastric varices. The highlighted predisposing factors include the improper use of contaminated needles and unsafe blood transfusions (Ryanand Ray, 2004).The literature review had highlighted the importance of blood complete picture examination in all suspected cases of HCV (Ando et al., 2001; Simon et al., 1980; Sahin et al., 2003). The variation in different

hematological parameters can serve as a screening test to diagnose the infection. This is important because we belong to the list of developing nations where more than 60% population is residing in rural areas and hence lacking the modern diagnostic facilities. The awareness regarding changes in blood complete picture and hence further referral for proper molecular diagnosis and management can ultimately reduce the high morbidity and mortality rate.

METHODOLOGY

A descriptive study was carried out at the Department of Pathology, Al-Nafees Medical College and Hospital (ANMC&H), Islamabad, Pakistan from January 2012 to February 2013. A simple random sampling technique was adopted for the study. Informed consent followed by a questionnaire filling was the prerequisite of study. All the willing patients of an age range between 18 to 40 years group, who presented for HCV screening were *included* in the study. While the non-willing patients or those who had a history of Hepatitis C viral (HCV) infection were *excluded* from the study.

*Corresponding author: e-mail: kiran.tauseef@yahoo.com

A 5 ml sample of venous blood was taken aseptically from all the selected willing patients. 2 ml sample was preserved in a gel tube to obtain serum, which was then separated at 3000 rpm for five minutes and ultimately used for immune chromatographic test (ICT) for the detection of anti-HCV antibodies. 3 ml of sample was preserved in EDTA for blood complete picture examination (three part differential celtac alpha). Hemoglobin, platelet count and total leucocyte counts (TLC) were the three parameters assessed in relation to positive cases of HCV.

The results were analyzed by SPSS version 16. For qualitative variables frequencies were calculated in term of percentages, while for quantitative variables, mean and standard deviations were assessed for statistical inference.

RESULTS

The study distribution along with the results of current study is shown in table 1. Out the total 182 randomly selected patients, 122 patients

(67%) were found to be positive for the presence of anti-HCV antibodies by ICT. Hepatitis C infection was more obvious in females. Out of the total 122 patients, 54.9 % (n=67) females and 45.08% (n=55) males were HCV positive. This is shown in table I. The mean age of the male patients was 29.7 ± 0.001 years, while the mean age of females was 25.3 ± 0.004 years.

About 41.7% (n=28) females out of the total 54.9% (n=67) presented a history of various forms of surgeries like cesarean sections [78.5% (n=22)], vaginal deliveries [10.7% (n=03)], dental procedures [10.7% (n=03)]. While out of the total 45.08% (n=55) males only 30.9% (n=17) had a history of dental procedures.

The mean value of Hb, platelet counts and TLC are shown in table I. The mean Hb levels in newly diagnosed HCV positive cases were 11.98 ± 0.425 , with a non-significant difference between males and females (p value < 0.001). While 123 ± 2.5 and 8.11 ± 0.015 were the mean values of platelets and TLC, with a non-significant difference between males and females (p value < 0.001).

Table 1: Mean Values of Hematological Parameters in Hepatitis C Positive Patients

Sr. No.	GENDER	STUDY DISTRIBUTION [% (n)]	MEAN VALUE OF Hb (gm/dl) [Mean \pm SD]	MEAN VALUE OF PLATELETS(mm ³) [Mean \pm SD]	MEAN VALUE OF TLC (mm ³) [Mean \pm SD]
1.	MALE	45.08(55)	12.50 ± 0.43	130.07 ± 2.7	9.025 ± 0.02
2.	FEMALE	54.9 (67)	11.46 ± 0.42	117.6 ± 2.3	7.21 ± 0.01
3.	TOTAL	100(122)	11.98 ± 0.425	123 ± 2.5	8.11 ± 0.015

DISCUSSION

Results of our study have shown 67% frequency of HCV in Islamabad. This is different from the study result, which narrated the 25% prevalence of HCV in Pakistan (Bosan et al., 2010). While the increased prevalence of HCV infection in females is similar to the study findings carried out on Romanian population (Bakr et al., 2006). The results of current study have shown that the values of Hemoglobin both for males and females (HCV positive patients) are within normal range. This finding is different from the studies which described that the hemoglobin is higher in HCV patients (Chen et al., 2008; Sahin et al., 2003).

Moreover, the TLC values extracted from current study both for males and females (HCV positive patients) are within normal range. This is different from the Indian study that had shown the decrease in TLC amongst HCV patients (Gandhi, 2007).

The platelet count was observed to be lower in HCV positive patients. This is in favor of many published studies that, thrombocytopenia is an early diagnostic indicator for HCV infection (Vizcaino et al., 2009; Adilson, 2004; Wang et al., 2004). The presence of thrombocytopenia is strongly suggestive of HCV infection (Sylvestre and Clements, 2004). About 64-76% HCV positive had thrombocytopenia when compared to 6% of HCV negative patients

(Giannini, 2006). Thrombocytopenia in HCV patients can worsen with disease progression. Therefore, the appropriate therapeutic measures should be taken in order to reduce the morbidity and mortality rates from the said infection (Dodhy et al., 2011; Wang et al., 2004).

CONCLUSION

Blood complete picture examination is a useful screening tool to see the presence of HCV infection especially in peripheral areas of Pakistan where the lack of modern diagnostic facilities imposes a high morbidity and mortality rates from HCV infection. Moreover, thrombocytopenia is the most common feature observed in newly diagnosed HCV positive cases.

REFERENCES

- Adilson JDA, 2004. Hepatitis C virus associated thrombocytopenia: a controlled prospective, virology study. *Ann. Haematol.* 83:434-440.
- Ali SA, Donahue RM, Qureshi H and Vermund SH, 2009. Hepatitis B and hepatitis C in Pakistan: prevalence and risk factors. *Int. J. Infect. Dis.* 13(1): 9-19.
- Ando M, Iwamoto Y, Suda A, Tsuchiya K and Nihei H, 2001. New insights into the thrombopoietic status of patients on dialysis through the evaluation of megakaryocytopoiesis in bone marrow and of endogenous thrombopoietin levels. *Blood.* 97(4):915-921.
- Bakr I, Rekaewicz C, Hosseiny ME, S Ismail, Daly ME and Kafrawy SE, 2006. Higher clearance of hepatitis C virus infection in females compared with males. *Gut.* 55(8): 1183-1187.
- Bosan A, Qureshi H, Bile KM, Ahmad I and Hafiz RA, 2010. Review of hepatitis viral infections in Pakistan. *J. Pak. Med. Assoc.* 60(12):1045-1058.
- Chen CB, Chou CY, Tseng YH, Huang CC, Chen W and Shih CM, 2008. Chronic Hepatitis C infection is associated with higher hemoglobin levels in hemodialysis patients, but hepatitis B infection is not. *Dialys. Transplant.* 37(1): 12-17.
- Dodhy MA, Zafar H and Aslam W, 2011. Chronic Lymphocytic Leukaemia; An experience of a decade at a tertiary care hospital. *Ann. PIMS.* 7(4): 196-199.
- Gandhi T, 2007. Cirrhosis is associated with low CD4⁺ T cell counts: Implications for HIV-infected patients with liver disease. *Clin. Infect. Dis.* 44 (3): 438-440.
- Giannini EG, 2006. Thrombocytopenia in chronic liver disease and pharmacological treatment options. *Aliment. Pharmacol. Ther.* 23: 1055-65.
- Memon AR, Shafique K, Memon A, Draz AU, Rauf MU and Afsar S, 2012. Hepatitis B and C prevalence among the high risk groups of Pakistani population. A cross sectional study. *Arch. Public Health.* 70(1):9. doi: 10.1186/0778-7367-70-9.
- Ryan KJ and Ray CG, 2004. Hepatitis C. *Sherris Medical Microbiol.* 4th ed. McGraw Hill. 551-552.
- Sahin I, Arabaci F and Sahin HA, 2003. Does hepatitis C virus infection increase hematocrit and hemoglobin levels in hemodialyzed patients? *Clin. Nephrol.* 60:401-404.
- Simon P, Meyrier A, Tanquerel T and Ang KS, 1980. Improvement of anaemia in haemodialysed patients after viral or toxic hepatic cytolysis. *Br. Med. J.* 280:892-894.
- Sylvestre DL and Clements BJ, 2004. The utility of indirect predictors of Hepatitis C viremia. *Drug. Alcohol Depend.* 74(1): 15-19.
- Vizcaino G, Diez-Ewald M and Vizcaino-Carruyo J, 2009. Treatment of chronic immune thrombocytopenic purpura; looking for something better. *Invest. Clin.* 50(1): 95-108.
- Wang CS, Yao WJ, Wang ST and Chang TT, 2004. Strong association of hepatitis C viral infection and thrombocytopenia: implications from a survey of a community with hyperendemic HCV infection. *Clin. Infect. Dis.* 39(6): 790-796.