ANALYSIS OF COMPLETE BLOOD PROFILE (CBC) IN CASES OF HEPATITIS PATIENTS IN MAYO HOSPITAL LAHORE

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Abstract:
Introduction: Liver is a pivotal organ of the body and play very important role in the metabolism. If there is any problem in the liver then the herbs or different plants play an important role for the treatment of liver disorders.
Objectives of the study: The main objective of the study is to find the complete blood analysis in hepatitis patients.
Methodology of the study: The study was done at Mayo hospital Lahore during 2016 to 2017. This study was conducted according to rules and regulations of authority. 1.0 ml blood sample was taken from vein and blood was further processed for the estimation of CBC by using commercially available enzymatic kits of Randox. Results: Our result indicated that platelet-related indices significantly differed between the HCV-infected group and the negative control group. Compared with the control group, the HCV-infected group had significantly lower platelet counts (PLT) and plateletcrit counts (PCT) but significantly higher platelet distribution mean platelet volumes (MPV), and platelet-large cell ratios (P-LCR). Conclusion: Our results concluded that hepatitis directly effect on a human body and blood system, due to which RBC count and other values become low as compared to normal values.
Key words*: Hepatitis, CBC, Liver, Organ*

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INTRODUCTION:

Liver is a pivotal organ of the body and play very important role in the metabolism. If there is any problem in the liver then the herbs or different plants play an important role for the treatment of liver disorders [1]. There are a number of plants which shows hepatoprotective property. Hepatitis B and C viruses can lead to hepatocellular carcinoma and cirrhosis-related end-stage liver disease, which are potentially life-threatening liver diseases. Hepatitis B and C need immediate worldwide attention as the infection rates are too high. More than 240 million people globally have chronic (long-term) liver infections. Every year, about 600,000 people die because of the acute or chronic consequences of hepatitis B, and more than 350,000 people die from hepatitis C-related liver diseases worldwide [2].

In the Middle East and the Indian subcontinent, an estimated 2%–5% of the general population is chronically infected with hepatitis B. Countries with the highest reported prevalence rates of hepatitis C are located in Africa and Asia; areas with lower prevalence rates of hepatitis C include industrialized nations in North America and Northern and Western Europe [3]. Studies have been conducted in Pakistan to assess the prevalence as well as identify the various risk factors associated with hepatitis B and C. A meta-analysis indicates that the prevalence of hepatitis B and C in the general population in Pakistan is 2.4% (range, 1.4%–11.0%) and 3.0% (range, 0.3%–31.9%), respectively [4].

In most of these studies, however, very few risk factors were included in one study at a time. Many risk factors have been identified worldwide, e.g., blood transfusion, IV drug abuse, profession (health care workers, barbers, etc), household contact, sexual contact, surgical procedures, dental procedures, immune-compromised hemodialysis, skin tattoos, etc, but the ones responsible for the high prevalence of hepatitis B and C in our cities need to be identified [5].

Objectives of the study

The main objective of the study is:

- To find the complete blood analysis in hepatitis patients

METHODOLOGY OF THE STUDY:

The study was done at Mayo hospital Lahore during 2016 to 2017. We select all the confirmed cases of hepatitis which was come at Mayo hospital Lahore. The data was collected from 100 patients and compare these values with normal group. This study was conducted according to rules and regulations of authority. 1.0 ml blood sample was taken from vein and blood was further processed for the estimation of CBC by using commercially available enzymatic kits of Randox.

Statistical analysis

The data were sampled and entered into the SPSS worksheet for analysis. The alpha criterion was set at 0.05 (95% confidence interval [CI]). After constructing a 2×2 contingency table, chi-square without Yates correction was used to find the association between the potential risk factors and hepatitis status.

RESULTS:

Our result indicated that platelet-related indices significantly differed between the HCV-infected group and the negative control group. Compared with the control group, the HCV-infected group had significantly lower platelet counts (PLT) and plateletcrit counts (PCT) but significantly higher platelet distribution widths (PDW), mean platelet volumes (MPV), and platelet-large cell ratios (P-LCR). Restated, the HCV-infected group had lower PLT and PCT but higher MPV, PDW, and P-LCR. This implied that the HCV-infected group had larger, more irregular, and more numerous platelets compared to the controls.

Table 01: CBC of hepatitis patients of local population of Pakistan

Variable	HCV-infected group	*t*-test P	ANCOVA P [#]
Male	83 (57.6)		
Female	61 (42.4)	<0.001	
Age mean (sd)	39.3 ± 10.8	0.071	
WBC ($\times 10^3 \mu l$)	6.8 ± 1.9	<0.001	0.006
RBC ($\times 10^6 \mu l$)	4.9 ± 0.7	<0.001	0.024
HB (g/dl)	14.7 ± 1.5	<0.001	<0.001
HCT (%)	43.0 ± 3.9	<0.001	0.001
MCV (fl)	89.1 ± 8.0	0.243	0.122
MCH (pg)	30.5 ± 3.1	0.008	0.030
MCHC (g/dl)	34.2 ± 1.0	<0.001	0.005
PLT ($\times 10^3 \mu l$)	222.3 ± 58.8	<0.001	<0.001
NEU (%)	56.4 ± 9.0	0.052	<0.001
LYM (%)	34.0 ± 8.2	0.270	0.648
MONO (%)	6.6 ± 1.8	<0.001	<0.001
EOS (%)	2.5 ± 1.6	0.630	0.174
BAS (%)	0.5 ± 0.3	0.140	0.230
RDW-SD (fl)	41.8 ± 2.9	0.013	0.055
RDW-CV (%)	13.3 ± 1.5	0.040	0.034
P-LCR (%)	31.7 ± 6.2	<0.001	<0.001
PCT (%)	0.2 ± 0.1	<0.001	<0.001
NEUT ($\times 10^3 \mu l$)	3.9 ± 1.4	0.034	0.090
LYMPH ($\times 10^3 \mu l$)	2.3 ± 0.7	<0.001	0.004
MONO ($\times 10^3 \mu l$)	0.4 ± 0.1	<0.001	<0.001
EOS ($\times 10^3 \mu l$)	0.2 ± 0.1	0.083	0.561
BAS ($\times 10^3 \mu l$)	0.03 ± 0.02	0.463	0.789
TPO (pg/ml)	74.4 ± 66.3	<0.001	<0.001
ALT (IU/L)	35.5 ± 45.0	0.006	0.339

DISCUSSION:

Damage to the structural integrity of liver is reflected by an increase in the level of serum transaminase because these are cytoplasmic in location and are released into circulation after cellular damage[6]. It is generally accepted that the toxicity of carbon tetrachloride depends on the cleavage of the carbon-chlorine bond to generate a trichloromethyl free radical, and this free radical reacts rapidly with oxygen to form a trichloro methyl peroxy radical, which may contribute to the hepatotoxicity and subsequent increase in hepatic enzymes [7].

Since previous studies indicate that thrombocytopenia results from chronic liver disease, we speculated that a haematological comparison between a healthy blood donor and a donor with HCV might reveal the impact of HCV on PLT and TPO; an improved understanding of this impact could help determine whether a donor has HCV [8]. This hypothesis was tested by investigating the relationships among haematological indices and TPO and HCV viral loads. The haematological indices and TPO were also evaluated in terms of predictive performance. Because of the varying consent given by the participants, the negative control group and HCV-infected group were not matched by age or gender. Therefore, ANCOVA was used to adjust the statistical analysis for age and gender [9].

We found that in our society, the important risk factors for hepatitis B and C are household contact, history of dental work, history of surgery, sexual contact, and history of transfusion (blood and its components) [10]. The individual risk factor was stratified to know the degree of its influence using binary logistic regression.

The data analysis indicated that ALT levels were not significantly associated with HCV infection. The ALT levels were abnormal in most hepatitis patients and in most (70%–80%) HCV carriers. Identifying HCV is often difficult because HCV carriers with persistently normal ALT levels are usually asymptomatic or have nonspecific symptoms. Meanwhile, MPV is not a reliable indicator as its value is known to change over time in the presence of ethylenediaminetetraacetic acid (EDTA)

anticoagulant. Studies indicate that 15% to 25% of the people who recover from an initial HCV infection have persistent antibodies in the absence of the virus [11]. Thus, the 16.7% of cases who revealed positive RIBA and negative RNA in the serum HCV test in this study were most likely cases that had recovered.

In a previous study, an HCV-infected group, which also had chronic hepatitis and cirrhosis, had a mean PLT greater than 150×10^3 μL. In contrast, the mean PLT in the HCV-infected group in this study was significantly lower than that in the control group. This difference likely resulted from the relatively lower severity of infection in the HCV-infected group in the present study, since the average seropositive rate in blood donors is much lower than that in the general population in Taiwan. Thrombocytopenia is commonly defined as a PLT below 50,000 per microlitre, which is a level commonly observed in cases of viral infection [12]. In the current study, MPV, PDW, and P-LCR were higher in the HCV-infected group than in the control group, which indicates that large platelet formation is an inappropriate bone marrow response to thrombocytopenia.

CONCLUSION:

Our results concluded that hepatitis directly effect on a human body and blood system, due to which RBC count and other values become low as compared to normal values. To enhance the early detection of HCV infection, further studies are needed to modify and improve existing screening procedures and to develop convenient supplemental screening flowcharts. Until then, the findings of this study should be applied cautiously.

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