

Demographic overview for Gulf Countries visitor from Bangladesh and correlation of viral infected, abnormal liver and kidney disease patients with CBC parameters.

Abstract:

Hepatitis B Virus antigen (HBsAg), Hepatitis C Virus (HCV), Human Immunodeficiency Virus (HIV) and Syphilis is a major public concern because of shared route of transmission. Alanine transaminase (ALT) and Aspartate Aminotransferase (AST) and Bilirubin is measured for abnormal liver function test and Abnormal Kidney function is measured by creatinine. The complete blood count (CBC) is the most common examination used to monitor overall health in clinical practice as well as cheap in Bangladesh. Radiological Image could have cheap but HBsAg, HCV, HIV and Syphilis test is cost effective. The main aim to this study is to determine the viral positive, abnormal Kidney, Liver function patient's detection by doing cheap CBC test parameters. In this study, we have calculated normal patients CBC parameter and same HBsAg, HCV and syphilis patients, abnormal kidney and liver functions patients CBC parameters have been assembled. We also find out the relation with radiological image of chest X-ray for viral positive patients. The result of the study indicated that all CBC parameter of positive HBsAg, HCV and syphilis, abnormal kidney and liver patients approximately same. But only Mean Platelet Volume (MPV) and Platelet number have significant value. Abnormal Kidney and liver patients have high MPV 11.94×10^3 and HCV, HBsAg positive patients 9.9×10^3 whereas normal patients value is 9.7×10^3 . This study proves that there is significant effect for MPV value with normal and viral infected patients. This finding could have used early detection for overseas health checkup.

Keywords: MPV, CBC, HIV, HBsAg, HCV, Syphilis.

Introduction: Travel Health is a specific medical discipline designed to prevent and manage illnesses associated with international travel. Gulf Health checkup usually delivered through GCC approved medical center. Bangladesh is serving more than 100 medical checkup center and we have worked one medical Centre name Ibn Omar diagnostics and medical center, Fahima Tower, 31/32 Purana paltan, Dhaka. Recent year Bangladesh has introduced with new disease name COVID 19 and many of Bangladeshi travelers often visiting destinations with new health risk not know at home. [1] Every effort should be made to protect these travelers against health risks such as Malaria, Filariasis, Leishmania, HBs Ag, HCV, HIV and syphilis at their destination. One more interesting information is that international travelers are increasing and Bangladeshi travelers increase more than 1 million in Gulf. The requisition for gulf travelers must be fitted in HBS Ag, HCV, HIV, Syphilis and RBS, SGPT, SGOT, Creatinine, Bilirubin, x-ray chest P/A view must have been passed with suitable result. Hepatitis B virus is a major concern and about 400 million people were chronically infected with Hbs Ag virus but Bangladesh about 65 people tested positive between 6000 patients age were 16 to 42 years. [2] Hepatitis C virus infection is another major concern about 200 million people Infected globally but fortunately Bangladesh is out of risk from HCV because only 7 people tested positive among 6000 patients. HIV infection is rare in Bangladesh and we found only 1 patients from 6000 people. Another disease must have been

attention of civil people of Bangladesh because this infection near HBs Ag number whereas about 36 patients tested TPHA positive and 28 patients tested VDRL positive. [3] Liver function test is a major concern and about 80 people tested High Bilirubin and 82 person SGPT and SGOT high whereas 80 people related with High RBS sugar and 40 peoples creatinine result were threshold number. All the positive person tested in two branch and 6000 people all data have been collected. [4] Previously, many article have been published related with platelet distribution width and haemoglobin parameter with diabetic's patients. [5] But few paper have been found that HBsAg, HCV, HIV and syphilis infected patients could have determined with CBC parameters. In this paper we will interrelate with the hematological parameters with these unfit result. We know that every test here is very expensive and it very country to country but CBC is a cheap test whereas one person easily can get CBC test with cheap price and they could determine their health with the cheap test CBC instead of checking all parameters. [6] So ultimately our aim of study is to determine HBs Ag, HCV, HIV, Syphilis infected persons and abnormal Liver and kidney function test through complete blood count parameters.

Material and Methods:

1. Sampling Technique and patient information:

The sampling of GCC center name Ibn Omar Diagnostics and Medical center was commenced at the beginning of the sampling period i.e January 2023 and continued until the start of Jan 2024. Blood samples (5mL) were drawn at the respective clinic sites to avoid dropouts. Consecutive blood samples were collected aseptically from each Gulf traveler about 6000 patients. The procedure was to continue consecutive sampling until the pre-determined sample size was not reached, however this study was completed using the number of samples actually collected even though less than anticipated. The serum samples collected after centrifugation at 2500 g, were delivered to our laboratory under strict cold chain precautions. These samples were stored at -20 degree centigrade until assays were performed. To perform hematological test EDTA tubes are used and without any treatment whole blood is used for Complete Blood Count.

2. HBsAg quantization:

HBsAg levels were measured by the fully automated mago 400XL and ETI Max 3000 Analyzer The unit of measurement was IU/mL. This assay was calibrated against the WHO standard and allowed the quantization of HBsAg from 0.0060 to >3.000 IU/mL. A concentration higher than cut off value was considered as HBs Ag positive. Samples with an HBsAg level higher than >3.00 required a 1: 500 dilution with the diluent as recommended by the manufacturer and the exact concentration of HBsAg was measured.

3. HCV quantization:

HCV levels were measured by the fully automated ETI-Max 3000 analyzer and Mago 400 XL analyzer. The unit of measurement was IU/mL. This assay was calibrated against the WHO standard and allowed the quantization of HCV from 0.0070 to >3.000 IU/mL. A concentration higher than cut off value was considered as HCV positive. Samples with an HCV level higher than

>3.000 required a 1:500 dilution with the diluent as recommended by the manufacturer and the exact concentration of HCV was measured.

4. HIV quantization:

HIV levels were measured by the fully automated ETI-Max 3000 analyzer and Mago 400 XL analyzer. The unit of measurement was IU/mL. This assay was calibrated against the WHO standard and allowed the quantization of HIV from 0.0050 to >3.000 IU/mL. A concentration higher than cut off value was considered as HIV positive. Samples with an HIV level higher than >3.000 required a 1:500 dilution with the diluent as recommended by the manufacturer and the exact concentration of HIV was measured.

5. Syphilis quantization:

To determine Syphilis test at GCC centre usually check both TPHA and VDRL. TPHA levels were measured by the fully automated ETI-Max 3000 analyzer and Mago 400 XL analyzer. The unit of measurement was IU/mL. This assay was calibrated against the WHO standard and allowed the quantization of TPHA from 0.0060 to >3.000 IU/mL. A concentration higher than cut off value was considered as TPHA positive. Samples with a TPHA level higher than >3.000 required a 1:500 dilution with the diluent as recommended by the manufacturer and the exact concentration of TPHA was measured. In Addition to this VDRL is checked serologically. In our lab used newbio RPR imported from UK reagent. We took 20 uL serum from passenger and 50 uL RPR and those sample have typically a smooth grey pattern or a button of non-aggregated carbon particle in the centre of the test circle. Those sample have slight, small, large clumps of carbon particle with a clear background is thought trace, weak and strong reactive patient.

6. LIVER Function tests quantization:

Around the world certain parameters are used to detect lever function test. Such as SGPT, SGOT, Bilirubin, Alkaline phosphate, Gamma Glutamyl transferase, Bilirubin, Alpha feto protein, Fibro scan lever, Lactate dehydrogenase and ultrasound for whole abdomen. But in GCC center measured only SGPT, SGOT and bilirubin test. All of the tests were measured by the Dimension EXL 200 Series. The unit of SGPT and SGOT was U/L and Bilirubin was measured in mg/dL. The normal range for SGPT is up to 63 U/L unit and SGOT is up to 40 U/L and Bilirubin normal range Adult 0.2 to 1.20 mg/dl. If the result overcome above of the range than patients are suggest for to recheck that test and if the result over come very high result, then patient is thought unfit to travel Gulf country.

7. Kidney Function tests quantitation:

Most of the diagnostic center check serum creatinine, BUN, CPK, urine for albumin and protein, Cystatin C etc. But we did only creatinine and urine for protein. Creatinine was measured by

Dimension EXL 200 Series and the normal range for this test is 0.2 to 1.30 mg/dl. The result of greater than 1.40 is thought unfit patient and urine protein is check serologically. Uric 2V GP is used to check urine protein. Those patients' urine found protein is thought lighter urinal infected or low kidney function disease.

8. Hematological quantization:

Our Lab used sysmex xp 100 fully automated hematological analyzer to determine complete blood count and all of the parameter are analyzed. To confirm that parameter we used microscope (OLYMPUS) and Leishman stain to prepare the slide view. WBC, RBC, circulating eosinophil count, Hemoglobin, HCT, MCV, MCH, MCHC, Platelet, PDW, MPV, P LCR and PCT, Differential count as Lymphocyte, Neutrophil, Basophil, Eosinophil etc. But we used only hemoglobin to perform cbc test for GULF passenger. The normal range of Hb is 9.0 to 18.0 g/dL and below of the 9.0 g/dL results are suggested to recheck the test. We think all parameter have important and we will collect data for all parameters.

9. Radiological Analysis:

X-ray Image were obtained by the somatom DRH device (siemens, Erlangen, Germany), without contrast administration and with 10 mm interval, 2mm thick section, 310 mAs, 125 kVp 4 seconds of imaging time in bone algorithm, 512x512 reconstruction matrix and 1600/400 parenchymal and 350/50 mediastinal window range. X-ray scan were evaluated for the presence, distribution and extent of the following signs, ground glass attenuation, nodular areas of high attenuation, consolidation, linear areas of high attenuation, classified as non-septal lines, septal lines, honeycombing and architectural distortion. Extension of the involvement was assessed independently for each of the three zones of the thorax defined as follows. The upper zones were above the level of the main carina, the middle zones were under the level of the main carina and the inferior pulmonary veins and the lower zones were under the level of the inferior pulmonary veins. X-ray scores in the upper, middle and lower pulmonary zones were determined by visually estimating the extent of the disease in each zone. Pulmonary interstitial involvement was confirmed with prone position scanning who had X-ray findings. X-ray scans were interpreted in random order by two radiologists without any clinical data, the two observers assessed the scans together to reach a decision by consensus.

10. Statistical analysis:

Normality of the distribution of numerical variables was tested by the Anderson-Darling normality test. For variables with a normal distribution, mean value and standard deviation were calculated, for non-normal distributed variables median values and range. A p-values of less than 0.05 was regarded as statistically significant. Spearman rank correlation coefficient was used to estimate the correlation between HBsAg and HCV and syphilis patients. To calculate this count we have used IBM SPSS 19.0 version.

Result:**1. Association of normal patient's parameter with complete blood count parameter:**

According to the sample result between male and female a total of 6000 patients was analyzed before looked the positive patients we have mention about 30 normal parameter patients whose ALT range <63U/L and AST <40U/L, Bilirubin <1.0 mg/ml, creatinine range 0.70 to 1.30 mg/dl and HBsAg, HCV, HIV, TPHA Negative and VDRL non-reactive patients and we have calculate the average number for CBC parameters.

| Sample ID | WBC (4-11 cmm) | RBC (4.5-6.5) gm/dL | HGB (10-18) g/dL | HCT (40-54) % | MCV (74-94) pg | MCH (29-34) g/dl | MCHC (29-34) g/dl | PLAT (150-400)/cumm | NEU% | LYMP (20-50)% | MONO (02-08)% | EOS % | BASO % | MPV (7-11)*3 fL |
|--------------|----------------|---------------------|------------------|---------------|----------------|------------------|-------------------|---------------------|------|---------------|---------------|-------|--------|-----------------|
| SA-23-04-5 | 10.00 | 5.03 | 15.4 | 45.4 | 90.3 | 33.8 | 33.8 | 353 | 57.6 | 31.5 | 6.4 | 4.1 | 0.4 | 8.2 |
| SA-23-04-268 | 11.53 | 6.25 | 14.5 | 43.7 | 70.0 | 33.1 | 33.1 | 324 | 65.1 | 26.9 | 5.1 | 2.7 | 0.2 | 9.8 |
| SA-23-05-53 | 7.08 | 4.97 | 15.0 | 45.9 | 92.3 | 32.6 | 32.6 | 219 | 55.1 | 28.5 | 8.9 | 7.4 | 0.1 | 8.7 |
| KW-23-05-4 | 11.60 | 4.80 | 14.8 | 43.9 | 91.5 | 33.8 | 33.8 | 348 | 71.2 | 20.7 | 6.2 | 1.7 | 0.2 | 7.7 |
| SA-23-05-160 | 7.80 | 5.13 | 14.4 | 43.7 | 85.3 | 32.8 | 32.8 | 332 | 58.0 | 29.5 | 8.0 | 4.3 | 0.2 | 7.9 |
| OM-23-05-4 | 10.06 | 5.20 | 15.1 | 45.1 | 86.7 | 33.5 | 33.5 | 265 | 62.8 | 28.3 | 6.20 | 2.4 | 0.3 | 8.8 |
| SA-23-05-729 | 12.14 | 5.23 | 16.1 | 47.5 | 90.9 | 33.8 | 33.8 | 302 | 65.6 | 23.8 | 7.8 | 2.5 | 0.3 | 9.1 |
| SA-23-05-803 | 7.84 | 5.51 | 14.6 | 43.4 | 78.9 | 33.5 | 33.5 | 219 | 51.4 | 41.2 | 5.0 | 2.0 | 0.4 | 11.3 |
| SA-23-06-43 | 9.17 | 5.77 | 16.0 | 49.5 | 85.7 | 33.7 | 33.7 | 280 | 48.0 | 41.1 | 7.6 | 2.9 | 0.4 | 9.9 |
| KW-23-06-2 | 10.29 | 4.92 | 14.7 | 44.2 | 89.8 | 33.2 | 33.2 | 228 | 43.1 | 41.0 | 8.8 | 6.8 | 0.3 | 10.0 |
| SA-23-06-202 | 7.94 | 4.67 | 13.6 | 40.9 | 87.6 | 33.3 | 33.3 | 213 | 48.8 | 37.9 | 5.9 | 7.1 | 0.3 | 11.1 |
| SA-23-06-420 | 7.69 | 5.30 | 15.2 | 44.3 | 83.6 | 34.3 | 34.3 | 286 | 47.3 | 27.3 | 6.4 | 18.7 | 0.3 | 9.1 |
| SA-23-06-446 | 4.79 | 5.08 | 14.7 | 42.6 | 84.0 | 34.5 | 34.5 | 213 | 60.1 | 23.1 | 13.1 | 3.4 | 0.3 | 10.4 |
| SA-23-06-514 | 4.43 | 4.96 | 14.6 | 43.0 | 86.6 | 33.9 | 33.9 | 204 | 42.2 | 49.3 | 5.5 | 2.7 | 0.3 | 9.2 |
| OM-23-07-2 | 8.39 | 5.47 | 15.7 | 46.1 | 84.3 | 34.1 | 34.1 | 322 | 66.4 | 22.8 | 5.8 | 4.7 | 0.3 | 9.2 |
| SA-23-07-58 | 9.96 | 4.61 | 13.3 | 38.8 | 84.3 | 34.2 | 34.2 | 223 | 47.2 | 44.2 | 5.6 | 2.8 | 0.2 | 10.2 |
| SA-23-07-137 | 7.82 | 5.42 | 15.9 | 46.8 | 86.3 | 34.0 | 34.0 | 221 | 57.0 | 26.5 | 5.9 | 10.4 | 0.2 | 10.4 |

| | | | | | | | | | | | | | | |
|--------------|-------|------|------|-------|-------|-------|-------|-----|-------|-------|------|------|------|------|
| SA-23-07-275 | 7.43 | 5.34 | 14.1 | 42.9 | 80.3 | 32.9 | 32.9 | 242 | 55.8 | 37.5 | 5.0 | 1.5 | 0.2 | 9.0 |
| SA-23-07-369 | 11.21 | 5.28 | 14.3 | 42.7 | 80.9 | 33.4 | 33.4 | 247 | 49.7 | 38.6 | 5.4 | 5.9 | 0.4 | 10.3 |
| SA-23-07-546 | 10.50 | 5.16 | 14.5 | 43.8 | 84.8 | 33.0 | 33.0 | 134 | 63.7 | 28.2 | 4.0 | 3.9 | 0.2 | 13.2 |
| SA-23-08-50 | 5.68 | 5.41 | 14.3 | 43.3 | 80.0 | 33.1 | 33.1 | 198 | 40.6 | 44.8 | 9.0 | 5.4 | 0.2 | 12.1 |
| KW-23-08-9 | 7.23 | 5.11 | 15.6 | 45.8 | 89.6 | 34.2 | 34.2 | 228 | 59.5 | 31.5 | 3.9 | 4.9 | 0.2 | 8.9 |
| SA-23-08-170 | 4.69 | 6.58 | 14.5 | 43.1 | 65.4 | 33.7 | 33.7 | 231 | 36.8 | 50.2 | 8.3 | 4.5 | 0.2 | 10.4 |
| SA-23-08-243 | 6.65 | 4.89 | 15.2 | 43.8 | 89.6 | 34.6 | 34.6 | 361 | 38.5 | 52.3 | 7.5 | 1.4 | 0.3 | 8.2 |
| SA-23-08-351 | 7.78 | 5.14 | 14.7 | 43.9 | 85.4 | 33.5 | 33.5 | 381 | 48.3 | 42.7 | 5.8 | 2.8 | 0.4 | 8.5 |
| SA-23-08-431 | 10.00 | 5.55 | 15.8 | 45.5 | 82.1 | 34.7 | 34.7 | 355 | 70.0 | 22.6 | 5.6 | 1.5 | 0.3 | 9.0 |
| SA-23-08-510 | 9.18 | 5.38 | 13.7 | 39.3 | 73.0 | 34.9 | 34.9 | 498 | 58.7 | 33.2 | 4.3 | 3.3 | 0.5 | 9.3 |
| SA-23-08-526 | 9.06 | 4.01 | 12.1 | 33.9 | 84.5 | 35.8 | 35.8 | 252 | 43.9 | 42.0 | 8.0 | 5.8 | 0.3 | 10.1 |
| SA-23-09-2 | 8.31 | 5.05 | 14.7 | 41.0 | 81.3 | 35.7 | 35.7 | 238 | 72.1 | 19.9 | 7.0 | 0.7 | 0.3 | 10.1 |
| SA-23-09-84 | 11.78 | 5.24 | 14.5 | 40.9 | 78.0 | 35.5 | 35.5 | 233 | 63.8 | 29.3 | 3.4 | 3.2 | 0.3 | 11.5 |
| SA-23-09-102 | 6.77 | 5.62 | 11.0 | 32.7 | 58.2 | 33.6 | 33.6 | 221 | 57.6 | 34.1 | 4.8 | 3.1 | 0.4 | 9.9 |
| Average | 8.51 | 5.22 | 14.6 | 43.14 | 82.94 | 33.89 | 33.89 | 270 | 55.02 | 33.88 | 6.45 | 4.33 | 0.28 | 9.72 |

Table1: Complete Blood Count parameters of average value for 30 Patients compare with Normal lever function, normal kidney function, HBsAg, HCV, HIV, TPHA negative and VDRL non-reactive result patients.

2. Association of CBC parameter with high SGPT, SGOT, Bilirubin, Sugar, Creatinine result:

We have randomly choose only few patients result with >120 U/L of SGPT, >60 U/L of SGOT, Creatinine >1.4 mg/dl, Bilirubin >1.40 mg/dl and higher sugar value patients are placed in Table 2 altogether. Many patients we found but all of this patients contain approximately same value and we have placed only few abnormal biochemistry patients.

| Result parameter and | WBC (4-11 cmm) | RBC (4.5-6.5) gm/dL | HGB (10-18) g/dL | HCT (40-54) % | MCV (74-94) pg | MCH (29-34) g/dl | MCHC (29-34) g/dl | PLAT (150-400)/cumm | NEU % | LYMP (20-50)% | MONO (02-08)% | EOS % | BASO % | MPV (7-11)*3 fL |
|-------------------------|----------------|---------------------|------------------|---------------|----------------|------------------|-------------------|---------------------|-------|---------------|---------------|-------|--------|-----------------|
| SGPT 210 (SA-23-03-380) | 9.42 | 6.30 | 14.2 | 42.3 | 67.2 | 33.5 | 33.5 | 193 | 61.2 | 30.6 | 5.3 | 2.6 | 0.3 | 12.8 |
| Creat 3.13 SA-23-04-218 | 6.38 | 4.35 | 13.6 | 40.3 | 92.5 | 33.7 | 33.7 | 308 | 58.7 | 32.3 | 5.8 | 3.0 | 0.2 | 9.2 |

| | | | | | | | | | | | | | | |
|--|-------|------|-----------|-----------|-----------|-------|-------|------------|-----------|-------|------|------|-----|-------|
| Creat 2.45 SA-23-04-252 | 9.21 | 4.20 | 12.3 | 36.5 | 87.0 | 33.8 | 33.8 | 254 | 51.6 | 24.1 | 5.6 | 18.4 | 0.3 | 11.8 |
| SGPT 202, SGOT 81 SA-23-05-42 | 9.33 | 4.81 | 14.0 | 41.8 | 86.9 | 33.5 | 33.5 | 66 | 58.6 | 32.3 | 8.0 | 0.8 | 0.3 | 14.4 |
| Bilirubin 2.0 SA-23-05-164 | 6.95 | 5.14 | 14.3 | 43.9 | 85.4 | 32.6 | 32.6 | 192 | 49.9 | 40.2 | 6.7 | 2.9 | 0.3 | 11.5 |
| SGPT 330 SGOT 116 SA-23-05-228 | 8.76 | 5.28 | 15.1 | 45.3 | 85.8 | 33.3 | 33.3 | 162 | 54.5 | 34.0 | 7.3 | 3.9 | 0.3 | 14.5 |
| Sugar 240, Bili 1.4 SA-23-05-725 | 10.95 | 6.82 | 15.7 | 46.1 | 67.6 | 34.0 | 34.0 | 315 | 62.7 | 30.9 | 4.1 | 2.0 | 0.3 | 9.4 |
| Average | 8.71 | 5.27 | 14.1 7 | 42.3 1 | 81.7 7 | 33.48 | 33.48 | 212.8 5 | 56.7 4 | 32.05 | 6.11 | 4.8 | 0.3 | 11.94 |

Table 2: Compare average complete blood count parameters with abnormal high results of biochemistry results.

3. Correlation of CBC parameter with HBsAg positive patients:

We have detected many HBsAg patients but only few patients with HBsAg positive results have been placed in Table 3. All parameters are calculated and average result found between normal ranges. Only MPV value could have differentiate and the result is 10.2×10^3 fL value.

| Sample ID | WBC (4-11 cmm) | RBC (4.5- 6.5) gm/d L | HG B (10- 18) g/dL | HCT (40- 54) % | MCV (74- 94) pg | MCH (29- 34) g/dl | MCHC (29-34) g/dl | PLAT (150- 400)/c umm | NEU % | LY MP (20- 50) % | MONO (02- 08)% | EOS % | BASO % | MPV (7- 11)*3 fL |
|--------------|----------------------|-----------------------------------|--------------------------------|-------------------------|--------------------------|----------------------------|-------------------------|--------------------------------|----------|------------------------------|----------------------|----------|-----------|---------------------------|
| SA-23-04-13 | 7.65 | 5.16 | 15.7 | 45.2 | 87.7 | 34.8 | 34.8 | 234 | 43.4 | 47.7 | 5.9 | 2.4 | 0.6 | 9.0 |
| SA-23-04-103 | 11.18 | 5.00 | 14.1 | 42.0 | 83.9 | 33.7 | 33.7 | 59 | 41.7 | 39.0 | 7.9 | 10.9 | 0.5 | 10.6 |
| SA-23-04-159 | 10.39 | 5.88 | 15.0 | 45.4 | 77.3 | 33.1 | 33.1 | 226 | 57.8 | 26.7 | 5.8 | 9.4 | 0.3 | 9.4 |
| SA-23-04-300 | 12.58 | 6.38 | 16.0 | 51.2 | 80.3 | 33.2 | 33.2 | 236 | 65.1 | 26.5 | 5.0 | 3.1 | 0.3 | 11.0 |
| SA-23-05-72 | 10.13 | 6.41 | 12.3 | 38.2 | 59.6 | 32.2 | 32.2 | 192 | 46.7 | 41.7 | 8.5 | 2.9 | 0.2 | 10.4 |
| SA-23-05-220 | 9.94 | 5.53 | 14.4 | 44.1 | 79.8 | 32.7 | 32.7 | 281 | 53.9 | 34.2 | 7.1 | 4.6 | 0.2 | 8.6 |
| SA-23-05-244 | 5.23 | 5.33 | 15.5 | 45.0 | 84.4 | 34.4 | 34.4 | 183 | 48.3 | 44.5 | 4.7 | 2.3 | 0.2 | 12.1 |
| SA-23-05-306 | 5.88 | 4.42 | 13.4 | 41.5 | 93.9 | 32.2 | 32.2 | 193 | 59.8 | 25.1 | 7.6 | 7.3 | 0.2 | 10.1 |
| SA-23-06-430 | 10.31 | 5.44 | 16.2 | 47.0 | 86.4 | 34.4 | 34.4 | 271 | 64.2 | 22.3 | 5.9 | 7.4 | 0.2 | 9.0 |
| SA-23-07-238 | 9.35 | 5.17 | 15.3 | 48.3 | 93.4 | 31.8 | 31.8 | 222 | 52.5 | 36.0 | 7.3 | 3.9 | 0.3 | 12.4 |
| SA-23-08-385 | 5.94 | 4.70 | 14.3 | 43.0 | 91.5 | 33.2 | 33.2 | 226 | 48.3 | 39.3 | 6.8 | 5.4 | 0.2 | 9.3 |

| | | | | | | | | | | | | | | |
|--------------|-------|-------|-------|------|-------|-------|------|--------|-------|-------|------|------|-----|------|
| SA-23-09-76 | 12.31 | 5.06 | 14.2 | 39.7 | 78.4 | 35.9 | 35.9 | 280 | 58.3 | 33.2 | 5.9 | 2.3 | 0.3 | 9.4 |
| SA-23-10-307 | 15.9 | 9.0 | 5.04 | 43.4 | 86.1 | 31.5 | 36.6 | 263 | 77.4 | 77.4 | 15.3 | 7.4 | 0.3 | 12.7 |
| SA-23-09-393 | 16.0 | 24.54 | 5.52 | 46.2 | 83.6 | 34.6 | 34.6 | 222 | 88.8 | 60.1 | 4.6 | 7.4 | 0.4 | 8.8 |
| Average | 10.2 | 7.00 | 13.35 | 44.3 | 83.30 | 33.40 | 33.7 | 220.57 | 57.58 | 39.55 | 7.02 | 5.47 | 0.3 | 10.2 |

Table 3: Compare of average complete blood count parameters with HBsAg positive patients.

4. Association of CBC parameter with HCV positive patients:

This is very difficult to detect HCV patients because Bangladesh have very little person with HCV positive. But few patients rarely find out and their CBC value have been evaluate in Table 4. We saw approximately same as HBsAg patients MPV value and platelet number also same that proves MPV and Platelet have significant value to detect early same as HBsAg patients. However the ELISA method could have used to detect more appropriate.

| Sample ID | WBC (4-11 cmm) | RBC (4.5-6.5) gm/dL | HGB (10-18) g/dL | HCT (40-54) % | MCV (74-94) pg | MCH (29-34) g/dl | MCHC (29-34) g/dl | PLAT (150-400)/cu mm | NEU % | LYM P (20-50)% | MON O (02-08)% | EOS % | BAS O % | MPV (7-11)*3 fL |
|--------------|----------------|---------------------|------------------|---------------|----------------|------------------|-------------------|----------------------|-------|----------------|----------------|-------|---------|-----------------|
| SA-23-04-60 | 9.64 | 5.42 | 16.0 | 46.6 | 86.0 | 34.3 | 34.3 | 254 | 54.9 | 37.6 | 4.5 | 2.6 | 0.4 | 8.7 |
| SA-23-04-61 | 8.36 | 4.95 | 15.2 | 44.4 | 89.8 | 34.3 | 34.3 | 202 | 38.4 | 42.0 | 4.4 | 15.0 | 0.2 | 10.6 |
| OM-23-05-10 | 12.45 | 4.85 | 15.3 | 45.9 | 94.5 | 33.5 | 33.5 | 339 | 60.2 | 27.2 | 6.1 | 6.3 | 0.2 | 10.6 |
| SA-26-05-573 | 11.98 | 6.82 | 16.0 | 49.4 | 72.4 | 33.5 | 33.5 | 325 | 65.3 | 28.5 | 4.9 | 1.0 | 0.3 | 10.2 |
| SA-23-10-441 | 13.4 | 6.54 | 4.54 | 37.4 | 82.3 | 35.7 | 35.7 | 309 | 56.6 | 31.0 | 9.1 | 2.8 | 0.5 | 9.4 |
| Average | 11.16 | 5.71 | 13.40 | 44.74 | 85 | 34.26 | 34.26 | 285.8 | 55.08 | 33.26 | 5.80 | 5.54 | 0.3 | 9.9 |

Table 4: Compare of average complete blood count parameters with HCV positive patients.

5. Association of CBC Parameter with TPHA positive and VDRL Reactive patients:

Bangladesh have same patients number as HBsAg patients and many people have been detect only TPHA by using ELISA method but VDRL found non-reactive and Many person have both positive. We have collect CBC value in Table 5 for TPHA positive and or VDRL reactive. Interestingly we found same MPV value is 9.9×10^3 fL and Platelet number found highest and proved that MPV and platelet number could have indicate same viral infected and this case more clearly identify by applying another method like ELISA and serological test.

| Sample ID | WBC (4-11 cmm) | RBC | HGB | HCT | MCV | MCH | MCHC (29-34) | PLAT (150-400)/cumm | NEU% | LYMP (20-50)% | MONO (02-08)% | EOS % | BASO % | MPV |
|-----------|----------------|-----|-----|-----|-----|-----|--------------|---------------------|------|---------------|---------------|-------|--------|-----|
|-----------|----------------|-----|-----|-----|-----|-----|--------------|---------------------|------|---------------|---------------|-------|--------|-----|

| | | (4.5-6.5) gm/dL | (10-18) g/dL | (40-54) % | (74-94) pg | (29-34) g/dl | g/dl | | | | | | | (7-11)*3 fL |
|--------------|-------|--------------------|-----------------|--------------|---------------|-----------------|-------|--------|------|-------|------|------|-----|----------------|
| SA-23-05-356 | 6.51 | 5.87 | 14.1 | 42.9 | 73.1 | 32.9 | 32.9 | 197 | 54.2 | 35.5 | 5.6 | 4.4 | 0.3 | 11.2 |
| SA-23-06-127 | 7.58 | 4.62 | 13.3 | 39.0 | 84.5 | 34.1 | 34.1 | 413 | 48.9 | 39.6 | 8.1 | 3.0 | 0.4 | 9.4 |
| SA-23-06-396 | 8.02 | 5.83 | 15.2 | 46.0 | 78.9 | 33.1 | 33.1 | 328 | 53.3 | 33.2 | 5.8 | 7.5 | 0.2 | 8.5 |
| SA-23-07-418 | 8.87 | 5.34 | 13.4 | 41.0 | 76.8 | 32.7 | 32.7 | 376 | 49.6 | 36.1 | 9.5 | 4.4 | 0.4 | 10.0 |
| SA-23-07-492 | 7.62 | 4.10 | 11.2 | 33.4 | 81.6 | 31.9 | 31.9 | 410 | 51.9 | 37.9 | 5.8 | 4.2 | 0.2 | 8.2 |
| OM-23-10-7 | 16.0 | 13.43 | 6.12 | 45.9 | 75.1 | 34.8 | 34.8 | 245 | 63.6 | 28.1 | 6.9 | 1.0 | 0.4 | 10.3 |
| SA-24-01-304 | 14.8 | 11.2 | 4.9 | 41.4 | 84.5 | 30.2 | 30.2 | 228 | 50.5 | 42.5 | 7.2 | 3.9 | 0.4 | 12.8 |
| SA-24-01-338 | 15.5 | 7.9 | 5.11 | 41.5 | 81.2 | 37.3 | 37.3 | 276 | 53 | 39.8 | 6.9 | 4.2 | 0.4 | 9.6 |
| SA-23-11-375 | 12.1 | 11.7 | 4.41 | 34.4 | 78.0 | 35.2 | 35.2 | 423 | 52.0 | 40.4 | 6.8 | 4.1 | 0.3 | 9.1 |
| Average | 10.77 | 7.77 | 9.74 | 40.61 | 79.3 | 33.57 | 33.57 | 321.77 | 53.0 | 37.01 | 6.95 | 4.07 | 0.3 | 9.9 |

Table 5: Compare of average complete blood count parameters with TPHA positive and or VDRL negative patients.

6. Interrelation of Radiological image of patients with HBsAg patients

We have checked all HBsAg positive patients Chest X ray report. No abnormalities found in X ray report and We have manage four patient image that clearly express that HBsAg patients do not express any symptom in chest X-ray report. This report is collected in Figure1 for the patients ID is SA-23-09-393, SA-23-10-307, SA-23-04-103, and SA-23-04-159.

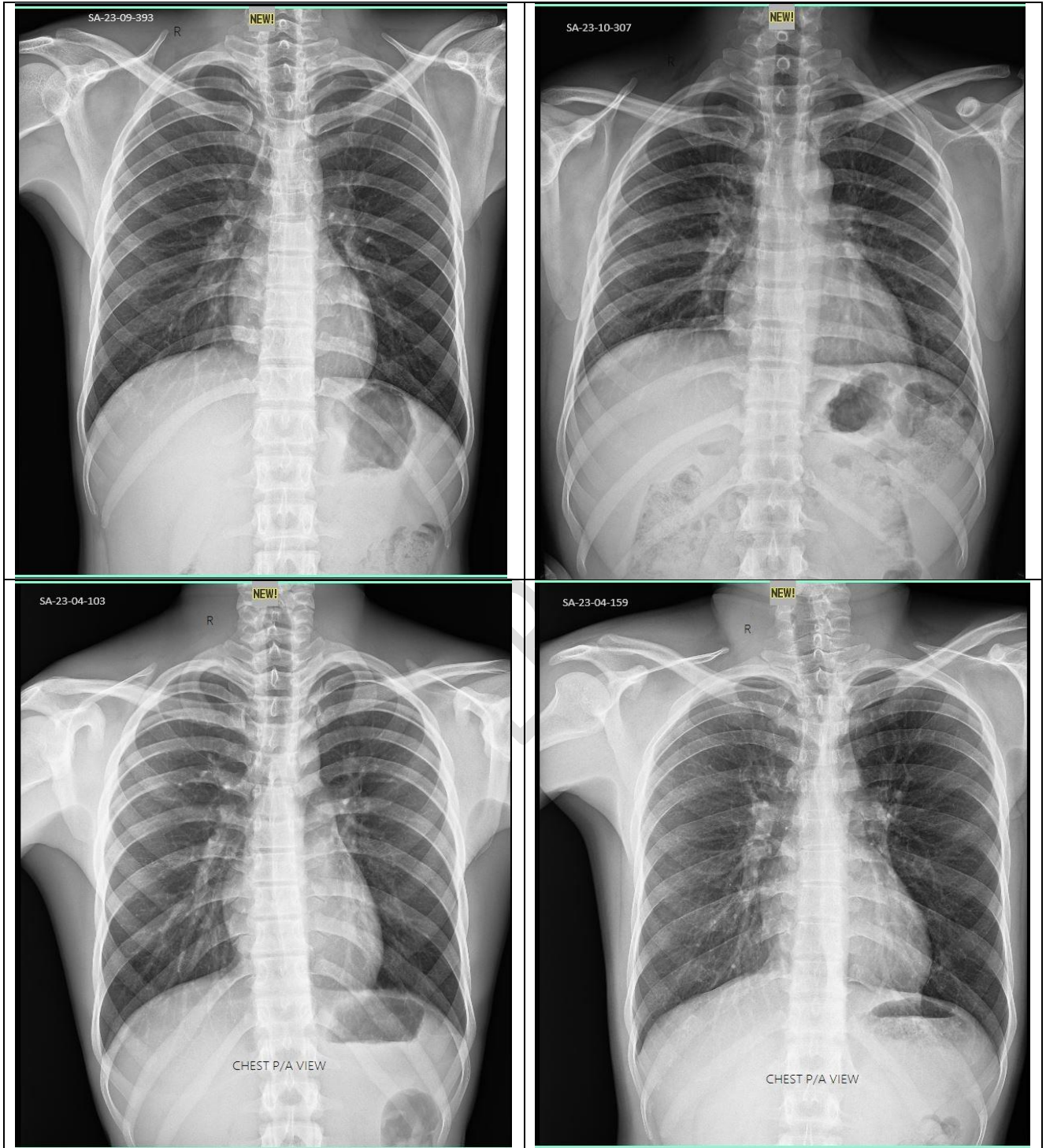


Figure1: Chest P/A view X-Ray report of HBsAg positive patients.

7. Correlation of Radiological image of patients with HCV patients

We know that HCV patients is rare in Bangladesh and we have collected all HCV patients X ray report in Figure2 with normal view. It is clearly said that HCV patients do not express

any symptom in X-ray report like HBsAg positive patients. The Patients with ID are SA-23-04-60, SA-23-04-61 and SA-23-10-441.

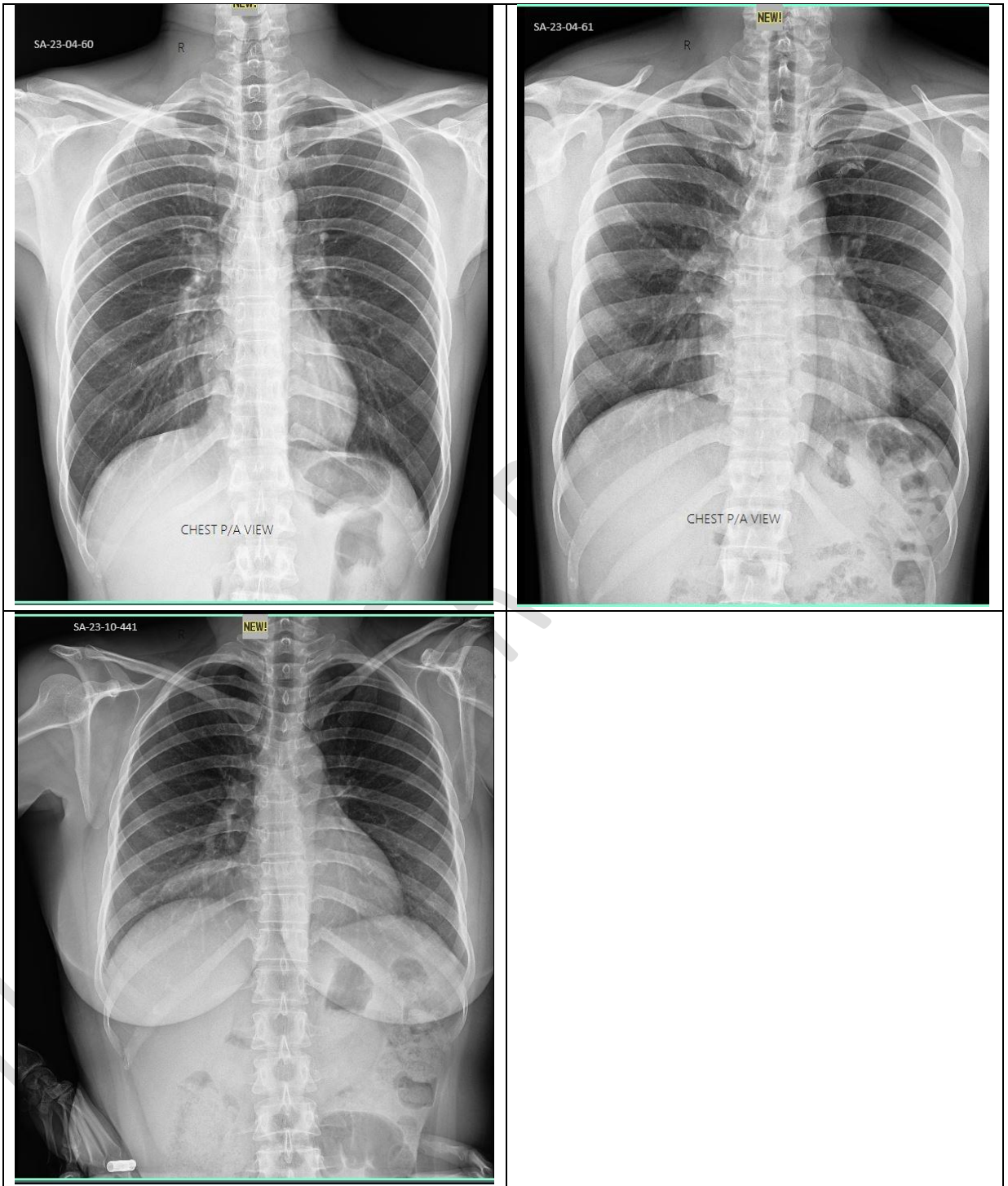


Figure2: Chest P/A view X-Ray report of HCV positive patients.

8. Correlation of Radiological chest X-ray Image with TPHA positive and or VDRL positive:

Accordingly we have analyzed all TPHA positive and or VDRL positive patients X-ray report in figure3 and Most of the report we found normal view and very few we found abnormal result like pneumonitis, calcification and old TV found. It could be said that TPHA and VDRL could have relate with abnormal result. We have manage four X-ray film and three patients report were normal and ID were OM-23-10-7, SA-23-11-375, SA-24-01-304 and one report was commented as Old TB found and the ID is SA-24-01-338. It could be said that pulmonary disease patients could have tested syphilis to identify more accurately for better treatment.

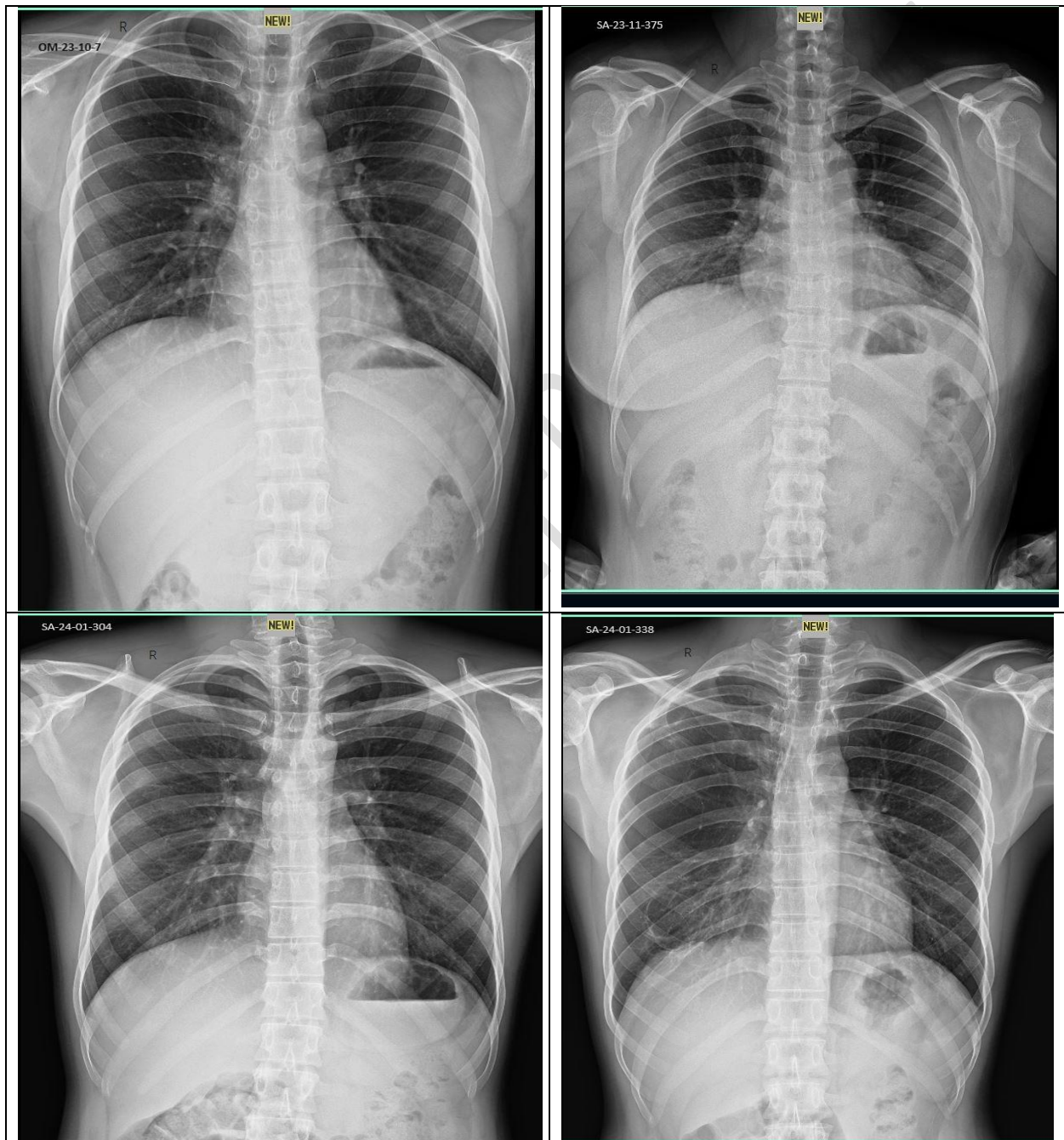


Figure3: Chest P/A view X-Ray report of TPHA positive and or VDRL reactive patients.

9. Overall high index CBC parameter compare with average normal patients parameter:

We have analyzed all CBC parameters and we have understand that all parameter found same as normal patients CBC parameter but MPV have another level difference. So we have collect its value in percentile basis in figure 4. We found normal patients carry 9.72×10^3 fL value whereas abnormal biochemistry result patients expressed significant difference and value is 11.94×10^3 fL. HBsAg, HCV and TPHA and or VDRL have found approximately same MPV value and this proves that this value could have carry many significant meaning and the value is 10.2×10^3 fL, 9.9×10^3 fL, 9.9×10^3 fL. All of the value have been gathered into a chart into percentile basis. We also overlook the Platelet number but we do not think that this number could lead person to viral positive result but high MPV and platelet number could have conscious more.

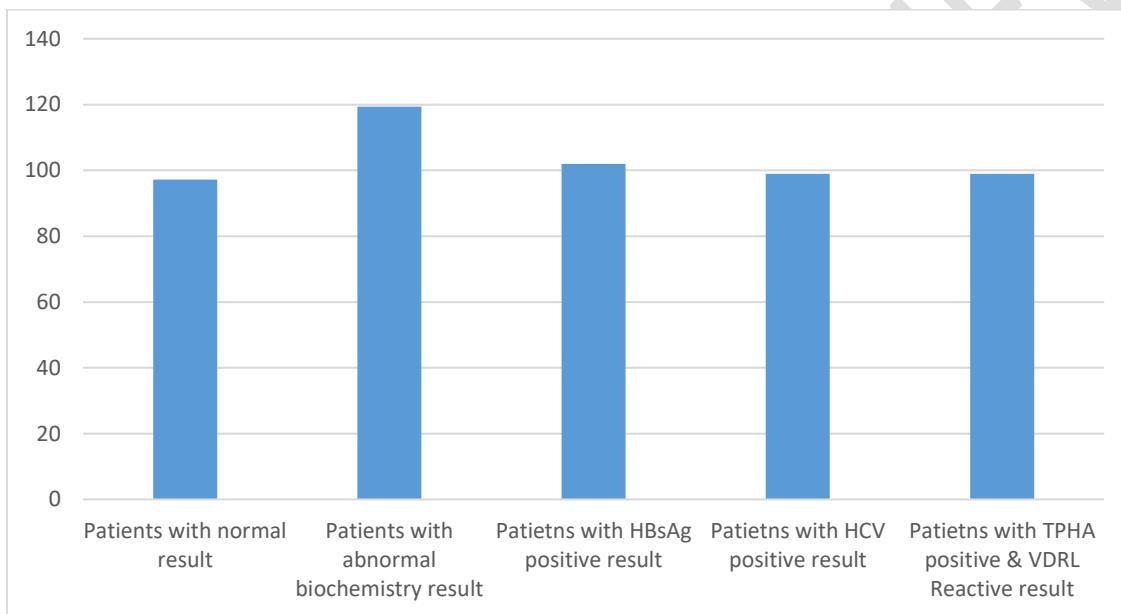


Fig 4: The interrelation of MPV value in percentile basis in graph for normal, abnormal biochemistry result, HBsAg positive, HCV Positive, TPHA and or VDRL reactive Patients.

Discussion:

The primary purpose of this study was to estimate abnormal patient's value through cheap test like CBC parameters and X-Ray chest p/v view. So the study mention some normal patients CBC parameters with abnormal patients result. [7] We know that those patients with HBsAg, HCV, TPHA and VDRL positive patients do not travel overseas. If some people do not know they are carrying this virus then it will really costly to perform directly GCC submission and if this information are given online then they could have banned for long time or permanent. So ultimately our goal was to know this viral infection previously through some cheap test. Firstly, Sexually transmitted disease remain a public health problem of major significance in most parts of the world. [8] The incidence of acute STDs is high in many countries including Bangladesh

although the precise magnitude of the problem is still not clear. Failure to diagnose and treat STDs at an early stage results in serious complications and sequelae, including infertility, fetal wastage, ectopic pregnancy, cancer and death. [9] The explanation for the increase in STDs is multifactorial, heterosexual promiscuity being one of them. However, many studies showing the varying rates of HIV, HCV and HBsAg infections among STD patients have been reported by several authors in overseas. The increase risk of HBsAg, HCV and HIV infection among STD patients warrants specific preventive action. HIV, HCV and HBsAg may promote each other and be related to different cultures and living habits though this does not appear to be the case in our study population. Screening the high risk population for these viral infections would aid early detection of co infections and hence early treatment which if initiated would help to decrease the further spread of these blood borne infections. There is a need therefore to support an approach of targeted screening of all these viral infections integrating viral hepatitis testing counselling and referral services into the existing STD patients prevention and treatment services. [10] Previously researchers observed that STDs like HIV, HCV, HBsAg and Syphilis infections could increase SGPT, SGOT and Bilirubin value. All of the biological parameter of SGPT, SGOT and Bilirubin expressed liver damage and High creatinine effect on kidney disease. SGPT, SGOT and Bilirubin related to white blood cell count, absolute value of monocytes, hematocrit and hemoglobin. However, Serum creatinine levels negatively correlated with SGPT and SGOT and kidney dysfunction people carry low MCV value. [11] Another study says that hemoglobin level high found in normal kidney functions patients and this value could decrease in abnormal kidney functions. HBsAg, HCV and syphilis does not affect with liver disease but lunge showed in syphilis have pulmonary involvement. All of the parameter of different cases do not find any abnormal value of CBC and only MPV have the noticeable. MPV value do not have in HCV, HBsAg and Syphilis patients but abnormal liver function test and abnormal kidney person carry high value.

Conclusion:

In Conclusion, with the highlights of our result, we can suggest that, every person should perform CBC test and this test could be analyzed with consultant for early detection of infection of HIV, HCV, HBsAg, Syphilis and abnormal liver and kidney function disease. It implies that, MPV value could indicate Abnormal liver and kidney function. Moreover, HIV, HCV, HBsAg, Syphilis patients MPV value could have high as well as Platelet count. However, as occurrence of coinfections is clinically consequential, patients need to check viral panel to make sure in early basis.

Data Availability

Not Applicable

Compliances with Ethical Standards

Not Applicable

Patient consent for publication

Not Applicable

Ethical approval and consent to participate

Not Applicable

Abbreviations:

CBC, Complete Blood Count; HBsAG, Hepatitis B Virus Surface Antigen; HCV, Hepatitis C Virus; TPHA, Treponema Pallidum Hemagglutination Assay; VDRL, Venereal disease research laboratory; HIV, Human Immunodeficiency Virus; WBC, White Blood Cell; RBC, Red blood cell; HGB, Haemoglobin; HCT, Hematocrit; MCV, Mean Corpuscular Volume; MCH, Mean Corpuscular Hemoglobin; PLAT, Platelet Count; NEU%, Neutrophyl Count Percent; LYMP, Lymphocyte Count; MONO, Monocyte Count; EOS, Eosinophyl Count; BASO%, Basophyl Count Percent; MPV, Mean Platelet Volume, STD, Sexually Transmitted disease; SGPT, Serum glutamic pyruvic transaminase; SGOT, Serum glutamic-oxaloacetic transaminase; Creat, Creatinine; ALT, Alanine transaminase; AST, Aspartate aminotransferase; GCC, Gulf Cooperation Council; TB, Tuberculosis Bacterium;

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