

Haemoglobin Distribution Width (HDW) is Low in Alcoholic Liver Disease



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INTRODUCTION & OBJECTIVE

- Haemoglobin Distribution Width (HDW) is a patient reportable parameter derived from the standard deviation of the red cell haemoglobin concentration histogram using ADVIA 2120i Haematology Systems (Siemens Healthcare Diagnostics, Tarrytown, NY, USA).
- Normal range for the HDW is 22 to 32 g/L.
- We evaluated the clinical utility of the RBC, Hb, HCT, MCV, MCH, MCHC, RDW and HDW parameters to differentiate alcoholic liver disease (ALD) from other causes of red cell macrocytosis.

METHOD

Eighty ethylenediaminetetraacetic acid (EDTA) samples sent for a routine full blood count, that presented with a mean cell volume (MCV) ≥ 105 fL were used in this study over a period of one month. Three categories were studied; alcoholic liver disease (n=26), B₁₂ or folate deficiency (n=15) and medication related (n=39). Analyzer quality control and maintenance tasks were performed according to the manufacturer's instructions.

RESULTS

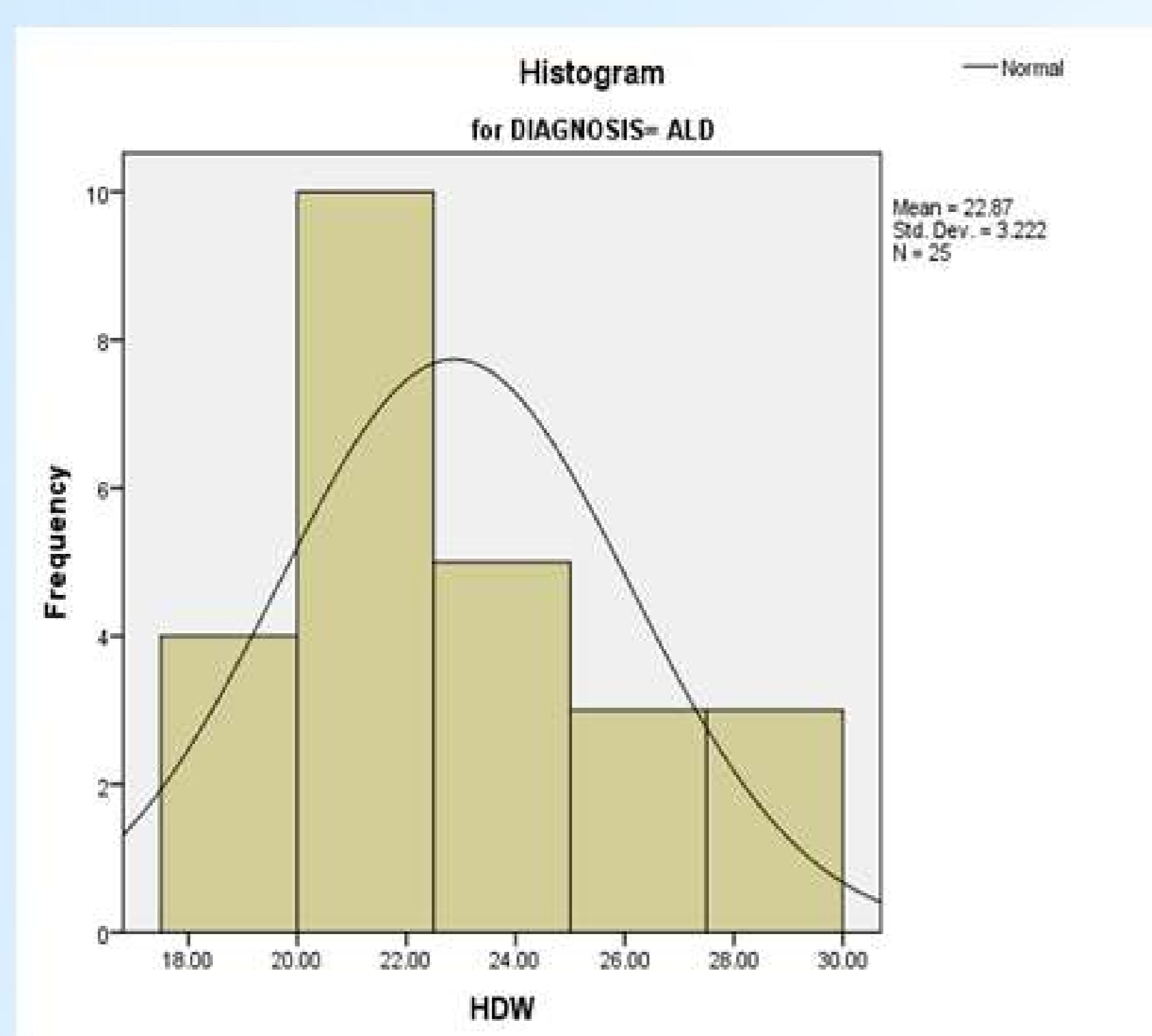


Figure 1a

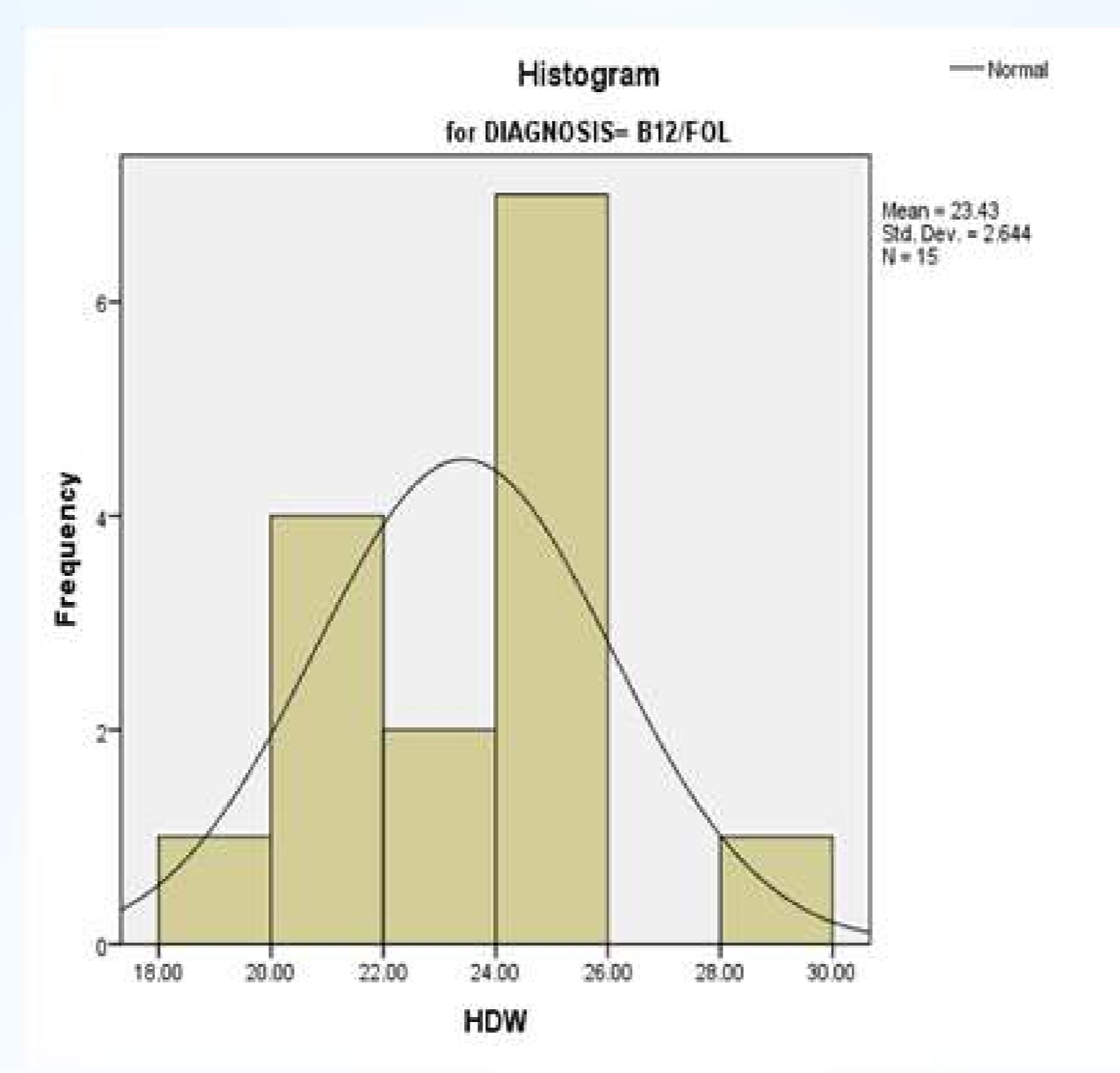


Figure 1b

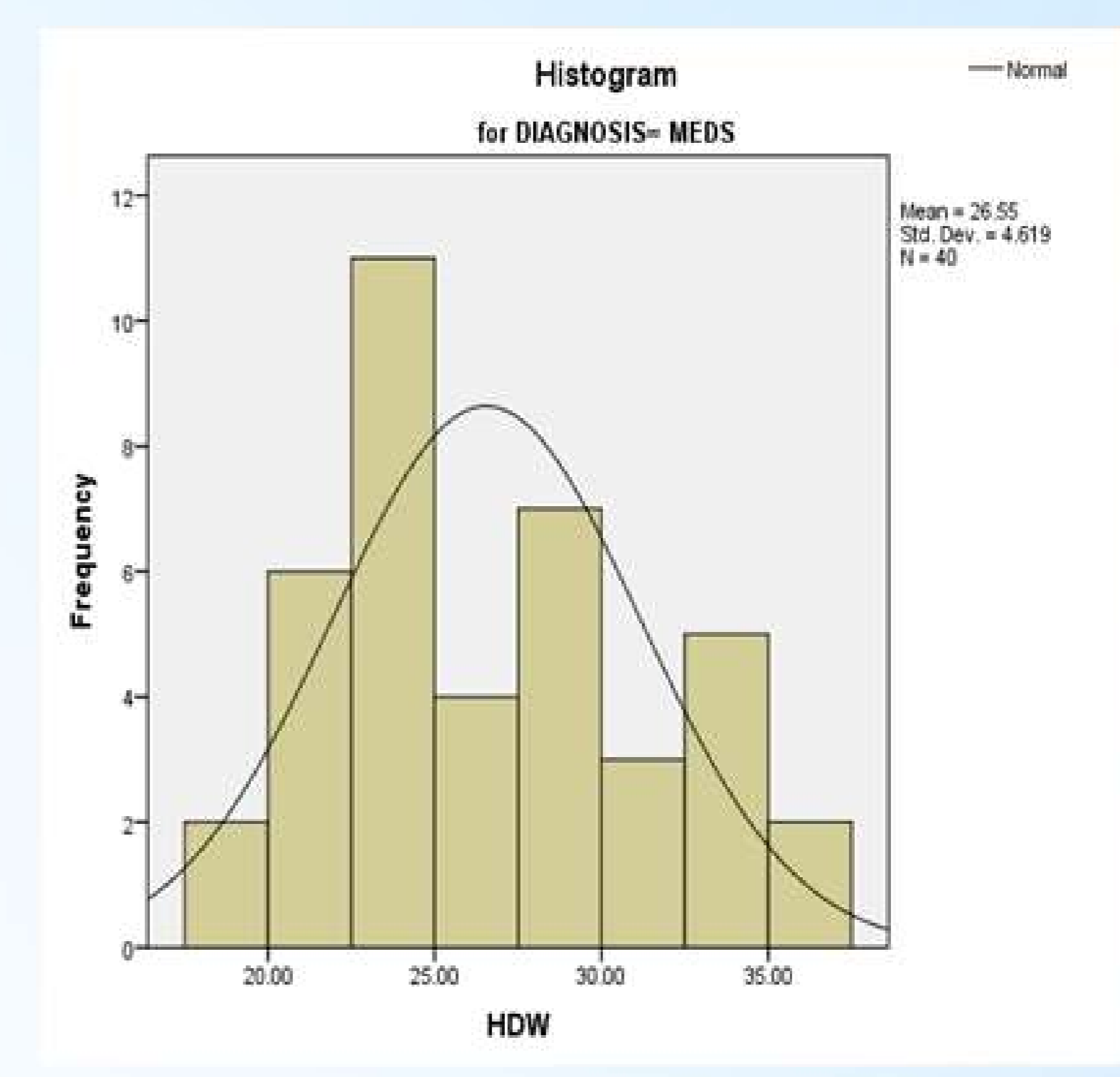


Figure 1c

ANOVA (HDW)						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	221.8823	2	110.9411	7.118217	0.001457	3.115366
Within Groups	1200.085	77	15.58552			
Total	1421.968	79				

Table 1

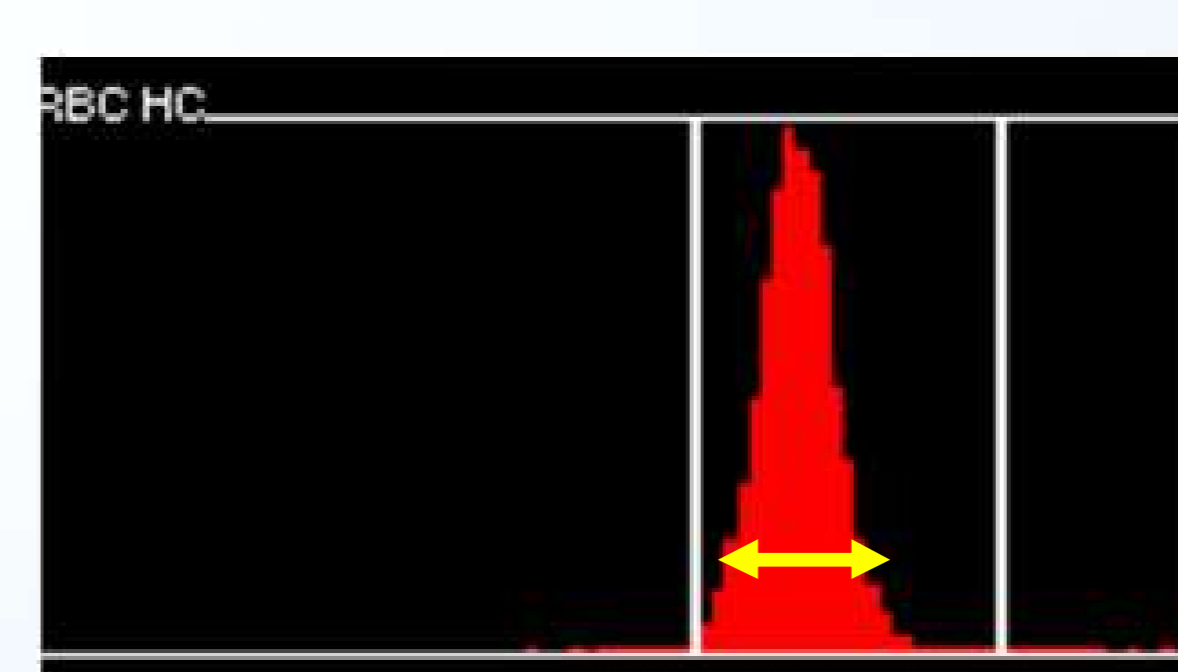


Figure 2a

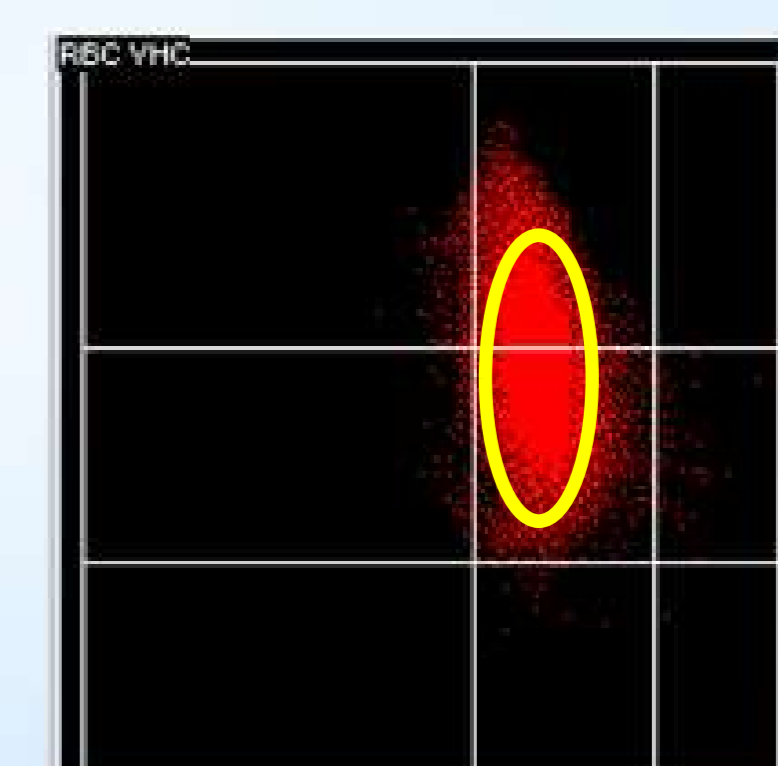


Figure 2b

DISCUSSION

Alcoholic liver disease, B₁₂ & folate deficiency and drug treatments are common causes of macrocytosis. Traditional red cell parameters such as RBC, Hb, HCT, MCV, MCH, MCHC and RDW were unable to differentiate these. Our study showed that only HDW was significantly different in all three categories (Figures 1a-1c & Table 1). In ALD the HDW measurement was found to be lower than the normal range in most cases and was shown to be lower than most cases of B₁₂ & folate deficiency or treatment related causes of macrocytosis. The RBC haemoglobin concentration histogram is correspondingly narrow in ALD (Figure 2a) and the 2-dimensional volume vs. haemoglobin concentration plot also has a characteristic shape not typically seen in cases other than ALD (Figure 2b). Stomatocytes and target cells are associated with a low HDW and both are a frequent finding in ALD.

CONCLUSION

Our study showed that an MCV ≥ 105 fL combined with a low HDW were suggestive of alcoholic liver disease. In cases presenting with a raised MCV and low HDW the possibility of alcohol misuse should be suspected and investigated accordingly.