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ASSESMENT OF HEMATOLOGICAL PARAMETERS IN DIABETES MELLITUS

Dr. Virendra G. Meshram[1], Utpal J. Dongre*[2], Dr. Hansini Laharwani[3], Dr. Parmanand Laharwani[4]

[1]Professor, University Department of Biochemistry,RTM Nagpur University, Nagpur 440033, Maharashtra, India.

[2]Assistant Professor, Department of Biochemistry, Dr. Ambedkar College, Deeksha Bhoomi, Nagpur 440010, Maharashtra, India.

[3]Intern student, Government Medical College, Akola, , Maharashtra, India.

[4]Laharwani Diabetes Care Centre, Ramdaspeth, Nagpur 440012, Maharashtra, India.

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***Correspondence for Author**

Utpal J. Dongre

Assistant Professor, Department of Biochemistry, Dr. Ambedkar College, Deeksha Bhoomi, Nagpur 440010, Maharashtra, India.

ABSTRACT

Diabetes mellitus is prevalent around the globe and alarming disease in India. Because of the change in life style, controling the blood glucose level is not a easy task for the patients. In last decade, research on diabetes mellitus was strictly focused on the biochemistry and molecular biology of an insulin. Many laboratories in the world tried to find out many drugs and therapeutics for diabetes mellitus but instead of controlling the pathogenesis of this diseases it has been spread. As diabetes mellitus is a metabolic disorder, something has to be linked with metabolism, blood biochemistry and hematology. Hence, monitoring the levels of biochemical and haematological parameters could be one of the important task to know about the new aspects of this disease. The present study has been undertaken to monitor the levels of various haematological parameters during a one year.

KEYWORDS: Hematology, Diabetes Mellitus, Hemoglobin, Pletelets etc.

Abbreviations: Mean Corpuscular Hemoglobin (MCH), Mean corpuscular volume (MCV) Mean corpuscular Hemoglobin Concentration (MCHC) Packed Cell Volume (PCV) Erythrocyte Sedimentation Rate (ESR).

INTRODUCTION

Diabetes mellitus is a metabolic disorder related to the insuin difficiency and metabolic pathways. Broadly, diabetes mellitus has been classified as Type 1 (Insulin dependent), type 2 (Insulin Independent) and gestational diabetes.[1] In recent past few decades, tremendous work has been done on diabetes mellitus, stating that diabetes mellitus is also associated with hypertention, heart diseases, aging, oxidative stress etc.[2,3] At molecular level, study of disease pathogenesis can open many doors for new research. Many scientists have been done fruitful research on diabetes mellitus, but focusing the research only on molecular biology or immunology meight not fully clarify the pathogenesis of pathogenesis of the disease; hence the assessment of other factors like hematolgy and biochemistry is required. Altered levels of other factors may gives some clue for better understanding of the disease.[4,5] Previous studies reported that diabetes mellitus has been associated with anemia and can altered the concentration of white blood cells. Non enzymatic glycosylation may cause RBC protein destruction[6,7] and therefore, it is very essential to evaluate the status of hematology in diabetic patients.

MATERIAL AND METHODS

Sample Collection

This work has been based on data collected in the year March 2013- February 2014 form the patients who came for routine blood and biochemical investigations at "Diabetes Care Centre" of Dr. Laharwani, Located at ramdaspeth, Nagpur, Maharshtra, India. Signed consents were taken from diabetic as well as from the control patients.

Sample Preparation

2 ml blood sample was collected from each patient and from each control subjects in EDTA containing vacutainer tube. The collected blood samples were then centrifuged at 3000 rpm for 15 minutes to separate out the plasma.

Analysis of the Samples

Analyses were done using fully automated Micros 60 by horiba using all standard kits. Protocols were run according to the manufacturer's instructions. All results were reported in their standard units.

Statistical Analysis

Statistical analyses were done using Med Calc software. Student "t"test was used to differentiate between the two parameters. 0.05 was taken as a significant level.

RESULT AND DISCUSSION

Table 1: Status of various hematological parameters

Parameter	Normal Range	Group	Mean±Sem	P Value
Platlets	3.5-5×10^{-5} /Ul	Control	3.11±0.1	
		Diabetes Mellitus	3.11±0.1	0.2
Rbc	4-5.9×106 Cells/ Ml	Control	4.45±0.2	
		Diabetes Mellitus	4.35±0.1	0.7
Hemoglobin	12-16 Gm/Dl	Control	13.08±0.47	
		Diabetes Mellitus	12.73±0.35	0.5
(Mean Corpuscular Hemoglobin) Mch	26-34pg/ Cells	Control	24.25±0.8	
		Diabetes Mellitus	24.35±0.5	0.9
(Mean Corpuscular Volume)Mcv	80-100 Fl	Control	78.50±1.7	
		Diabetes Mellitus	80.92±1.5	0.3
(Mean Corpuscular Hemoglobin Concentration) Mchc	31.5-36.3gm/Dl	Control	32.82±1.01	
		Diabetes Mellitus	32.42±0.70	0.7
Pcv	18-55%	Control	32.69±2.2	
		Diabetes Mellitus	36.39±2.0	0.2
(Erythrocyte Sedimentation Rate) Esr	0-20 Mm/Hr	Control	26.50±1.65	
		Diabetes Mellitus	27.21±1.46	0.7

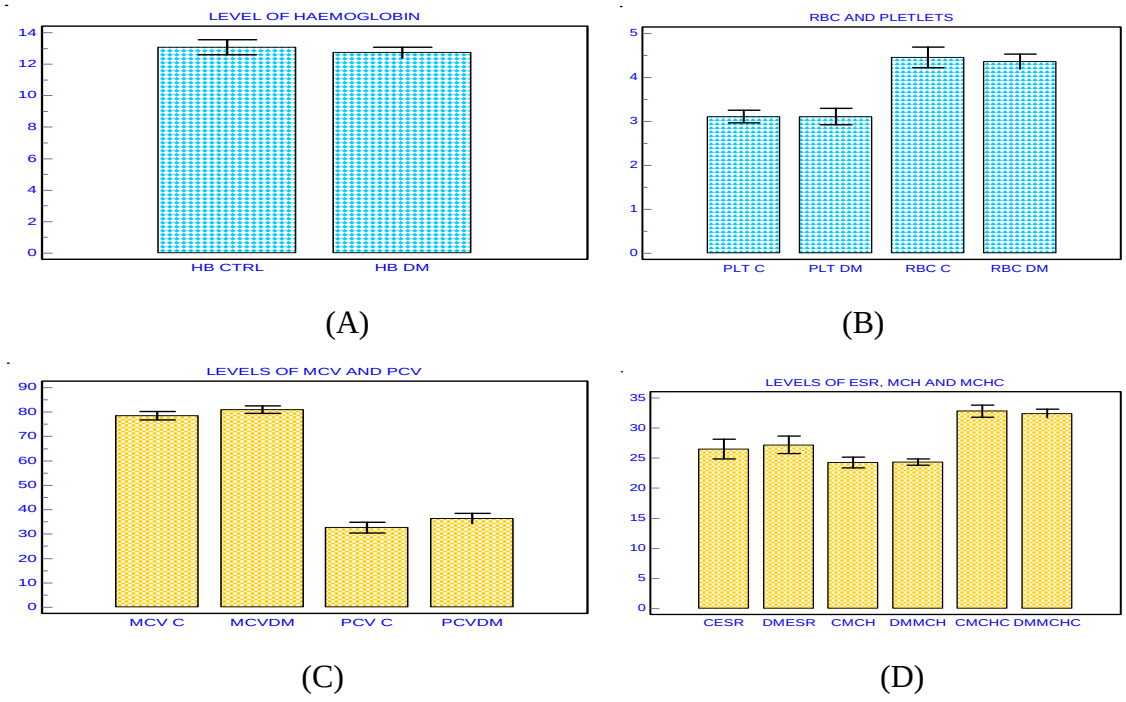

Fig 1: Figure A represents the levels of haemoglobin, figure (B) represents the levels of pletelts, figure (C) shows the levels of MCV and PCV while figure (D) shows the levels of ESR, MCH and MCHC.

The present study shows the status of different haematological parameters in control as well as in diabetic patients. This study demonstrates that there is no significant difference in haemoglobin concentration in both control as well as in diabetic samples ($p>0.05$) [Fig A,

Table 1]. There is no significant difference in the levels of pletlets (p> 0.05) and red blood cells (p> 0.05) within their concentraion when compared between control and diabetic patients [Fig B, Table 1]. The levels of MCV (p>0.05) and PCV (p>0.05) were also not significantly differed with each other in control and diabetic samples [Fig C, Table 1]. Similar results were also shown for ESR (p> 0.05), MCH (p>0.05) and MCHC (p >0.05) [Fig D, Table 1]. Results did not demonstrate any significant difference in the concentrations of selected parameters [Fig D, Table 1].

CONCLUSION

This study focused on the concentration of haematological parameters in patients with diabetes mellitus. Many studies have been done on the haematological parameters of diabetes mellitus and reported alteration of any kind. But this study did not shows any single alteration in the patients during March 2013- February 2014 year assessment period and shows all values in normal biological references ranges.

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