



DISLIPIDEMIA AND HbA1c IN CARDIAC AND DIABETES PATIENTS

Laboratory Medicine

Jayakrishnan.S* Microbiologist Grade I, Department of Laboratory Medicine, SK Hospital, Edappazhinji, Thiruvananthapuram 695006. *Corresponding Author

Jayanthi Bai.N Head of the department, Department of Laboratory Medicine, SK Hospital, Edappazhinji, Thiruvananthapuram 695006.

ABSTRACT

Diabetes Mellitus is a globally prevalent disease associated with hyperglycemia and dislipidemia which increase the risk for cardio vascular diseases. Dislipidemia and hyperlipidemia are found in CVD also. HbA1c is a biochemical marker for hyperglycemia over 3-4 months. Dislipidemia is higher in DM2 compared to CVD. HbA1c is almost identical in DM2 and CVD. Hence HbA1c cannot be considered as a biochemical marker for screening dislipidemia.

KEYWORDS

Cardiac Diseases, Diabetes Mellitus 2, HbA1c

INTRODUCTION

DM is a universal epidemic human disease with rapid raising prevalence in both developing and developed countries (1). According to WHO report 2005, around 171million peoples were affected with DM2 in worldwide in 2000 and would increase to 366million by the year 2030 (2).

In India alone 31.7million people had DM₂ in 2000 which later would increase to 101.2 million in 2030. India is the second largest country in the world diabetes prevalence (3). The maximum burden of diabetes in society is mainly contributed by DM2 which accounts for to 90% cases of DM.

HbA1c used as a marker of glycemic control over 3-4 month in diabetic patients (4). It predicts the risk of developing diabetic complications in diabetes patients which is a classical risk factor for cardio vascular disease (CVD). Each 1% increase in HbA1c shows 18% increase in CVD (5). A positive relationship between HbA1c and dislipidemia had been seen in DM2. Sanjeev Dhakal et al (6) reported that HbA1c can be taken as a screening biomarker for dislipidemia in DM2.

Dislipidemia is a complication of CVD and CVD also shows hyperglycemia too. Increasing glycemia and dislipidemia can lead to high HbA1c.

MATERIALS AND METHODS

METHODS:

102 samples were screened for total cholesterol, triglycerides and HbA1c and 72 samples of DM2 for FBS, total cholesterol, HbA1c. The patients were diagnosed as cardiac or diabetic by experts in the department of cardiology and diabetology. Samples were drawn using disposables syringes and needles after proper identification of the patient. The sample centrifuged at 3000rpm for 10 mins and unhemolysed serum transferred to vials carrying patient's name, OP/IP no and tests required. Total cholesterol, FBS and triglycerides measured with reagents supplied by Siemens Healthcare PVT LTD using Dimension® Xpand® Plus Integrated Chemistry System and Dimension® RxL Max® Integrated Chemistry analyser. HbA1c measured using Bio-Rad D-10 Hemoglobin A1c testing system supplied by AK Enterprises, Thiruvananthapuram. In all cases Biorad internal QC was run daily.

RESULTS

The patients were grouped according to age into six 30-40, 41-50, 51-60, 61-70, 71-80 and 81-90. They were subdivided into males and females.

GRBS and total cholesterol were within normal limits in cardiac patients. HbA1c ranged from 6.3- 8.5% and average were 5.4 in male. In females also total cholesterol were within limits. The HbA1c was lower than in males and ranged from 4-5.2% and the average was

4.5%. In diabetic patients total cholesterol was higher in males and females 244 and 222. HbA1c was almost the same 6.1 and 6.4 in males and females. Total cholesterol was higher in diabetic patients. HbA1c in cardiac and diabetic patients were almost the same.

DISCUSSION

Total cholesterol levels were higher in females and males probably due to high cardiovascular risk in diabetic patients. The HbA1c level too was slightly high compared to cardiac patient. Sanjeev Dhakal et al (2015) reported that HbA1c can be taken as a screening marker of dislipidemia in DM2. However in the present study the HbA1c levels in cardiac patients and diabetic patients do not differ much. This probably could be due to the fact that dislipidemia is present both in cardiac and DM2 patients. Dislipidemia risk is higher in DM2 than cardiac patients based on levels of total cholesterol. Thus HbA1c cannot be considered as a screening marker of dislipidemia. Only population studies with larger no of patients are needed for a definite conclusion.

Table											
Age Group	N	CARDIOLOGY MALES				CARDIOLOGY FEMALES					
		GR BS	Age Group	N	Total Cholesterol	Hb A1c	GR BS	Age Group	N	Total Cholesterol	Hb A1c
41-50	12	108	41-50	10	162	7.3	41-50	5	112	150	5.2
51-60	14	120	51-60	10	110	8.5	51-60	9	112	160	5.3
61-70	11	161	61-70	10	126	6.3	61-70	1	96	162	3.95
71-80	13	147	71-80	10	125	6.3	71-80	3	120	192	5.65
Total:-	50										

Age Group	N	DIABETIC MALES			DIABETIC FEMALES			MALE			FEMALE		
		Total Cholesterol	N	Hb A1c	Total Cholesterol	N	Hb A1c	Total Cholesterol	N	Hb A1c	Total Cholesterol	N	Hb A1c
31-40	10	234	2	5.8	3	219	7.2	1	215	6.5	5	232	5.2
41-50	4	208	4	7.4	3	217	5.4	5	203	6.4	4	210	6.4
51-60	10	217	7	5.3	7	239	4.2	9	221	7.0	4	212	6.4
61-70	12	237	12	6.4	7	219	7.2	8	188	7.6	6	284	7.2
71-80	36	161	4	6.3	6	227	8.5	5	195	6.2	3	285	6.3

CONCLUSIONS

Total cholesterol level is high in cardiac and DM2 patients. But the levels are higher in DM2 males and females as compared to CVD. But the levels of HbA1c is almost the same in DM2 and cardiac patients. Dislipidemia is higher in DM2 but HbA1c same as cardiac patients. This rules out the possibility of HbA1c taken as a biochemical screening marker of dislipidemia in DM2.

REFERENCES

- Berry C, Taadif J C, Bourassa M.G. Coronary heart disease in patients with diabetes: part 1: recent advances in prevention and noninvasive management. J. AM. Coll. Cardio 2007;49:631-42.
- Sandhu HS, Koley S, Sandhu KS. Study of correlation between Lipid Profile & Waist-Hip ratio in Diabetes Mellitus Anthropologist. 2008;10(3):215-18.
- Anjana RM, Pradeep R, Deepa M, et al Prevalence of diabetes and prediabetes (impaired fasting glucose and/or impaired glucose tolerance) in urban and rural India :phase I results of the Indian Council of Medical Research –Indian Diabetes (ICMR=INDIAB) study: Diabetologia 2011;54(12):3022-7.

4. Sultan A, Thuan JF, Avignon A. Primary Prevalence of cardiovascular events and type 2 diabetes should we prioritize our interventions? *Diabetes Metab.* 2006;32:559-567 |
5. Selvin E, Marinopoulos S, Berkenblit G, Rami T, Brancati FI, Powe NR. Metaanalysis: glycosylated hemoglobin and cardiovascular disease in diabetes mellitus. *Ann Intern Med* 2004;14:421-431. |
6. Sanjeev Dhakal, Uday N Sing, Subodh kumar. HbA1c: Its Evaluation As A Screening Biomarker of Dyslipidemia in Diabetes Type 2 Patients. *IJSR* 2015; 4 (10): 304- 306