The Use of HbA1c to Determine the Prevalence of Undiagnosed Diabetes and Pre-diabetes in Adult Emergency Department Patients



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INTRODUCTION

Diabetes mellitus is characterized by high blood glucose levels that result from the body's inability to produce and/or use insulin. Type 2 diabetes is often related to family history, age, obesity, diet, hypertension, and hyperlipidemia, among other factors. Long term complications of diabetes include retinopathy, nephropathy and neuropathy, as well as coronary artery disease, stroke, and peripheral vascular disease.

With pre-diabetes, blood glucose levels are above normal, but not high enough to be considered diabetes. If diagnosed early enough, patients can take measures – including exercise, change in diet, or even medication – to prevent or delay the onset of diabetes.

It is estimated that 24 million people in the United States have diabetes and 79 million have pre-diabetes, costing the US \$174 billion annually.

The hemoglobin A1c (HbA1c) is a blood test with a rapid turnaround time that has been approved by the American Diabetes Association (ADA) for the diagnosis of pre-diabetes and diabetes. The HbA1c may therefore facilitate the detection of pre-diabetes and diabetes in the emergency department.

OBJECTIVES

Our objective was to determine the prevalence of undiagnosed pre-DM and DM in hyperglycemic patients in the ED using HbA1c testing.

STUDY DESIGN

HbA1c levels were obtained from a convenience sample of adult patients $(\geq 18 \text{ years})$ presenting to the ED for six months (between 10/01/2010 and 3/31/2011) with an ED serum glucose level ≥100 mg/dl and no known histo of diabetes or pre-DM. Blood samples were collected as part of patients' routine clinical evaluations. Excess blood was used to obtain the HbA1c.

In accordance with ADA guidelines, HbA1c values of 5.7 – 6.4% were classified as pre-DM, and values $\geq 6.5\%$ were classified as DM. An ANOVA was used to analyze data.

RESULTS

We tested 450 patients (mean age 58 ± 19 years; 51% female; 57%hospitalized). Patients with a serum glucose (RSGL) of 100-125 mg/dl had mean HbA1c of 5.7% (n=162); for RSGL of 126-199 mg/dl, mean HbA1c was 5.9% (n=80); for RSGL ≥200 mg/dl, mean HbA1c was 7.4% (n=8) (p<0.001

Of the 450 patients, 197 (44%) had HbA1c between 5.7 and 6.4 and 53 patients (12%) had values \geq 6.5. Of hospitalized patients, 124 (48%) had provide the patient of the patient o DM and 25 (10%) had DM. Of discharged patients, 70 (37%) had pre-DM and 27 (14%) had DM.



	Percent of HbA1c:			Total ni
	≤5.6	5.7-6.4	≥6.5	10tal 11:
TOTAL	44	44	12	450
SEX				
M	36	46	19	221
F	53	42	5	229
AGE				
18-29	63	37	0	43
30-39	49	51	2	45
40-49	50	42	8	78
50-59	52	38	11	66
60-69	44	46	10	70
70-79	43	49	8	75
≥80	22	42	36	73
RANDOM SGL				
100-109	52	44	4	135
110-125	52	39	9	152
126-150	35	52	13	101
151-200	24	49	27	41
≥201	29	24	48	21
DISPOSITION				
Admitted	42	48	10	256
Discharged	49	37	14	189
Other*	20	60	20	5

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CONCLUSIONS

referral for proper follow-up and management.

*Patients left without being evaluated or against medical advice.

