



Correlation of HbA_{1c} Levels To Diastolic Dysfunction Assesed By Echocardiography in Stroke Patients

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ABSTRACT

AIMS :

- Assess the level of HbA_{1c} in relation to stroke.
- To determine the relationship between HbA_{1c} and diastolic dysfunction in stroke patients.

METHODS :

A cross-sectional hospital-based study was done which included 50 patients with stroke. Diastolic dysfunction was evaluated by Doppler echocardiography, in relation with age/sex and HbA_{1c} level in these patients. Data compiled & analysed in Microsoft Excel 2013 & Predictive analytics Software (SPSS) Vr. 11. Results shown in Frequencies and proportions. Sample 't' Significance tests applied. All stroke cases admitted in the department of General Medicine, ASRAMS, Eluru, Andhra Pradesh, India between July 2015 to october 2016 were taken for the study.

RESULTS :

- The study showed that 74% of stroke patients had diastolic dysfunction.
- 20 % and 70 % were categorized as pre diabetic and diabetics respectively on the basis of HbA_{1c} levels.

CONCLUSIONS :

- This Study demonstrated a highly significant (positive) correlation between HbA_{1c} level and frequency of diastolic dysfunction in stroke patients.
- Higher HbA_{1c} level is a reliable predictor of diastolic dysfunction in stroke patients.
- Hence we recommend HbA_{1c} level as an independent predictor of stroke.
- Doppler Echocardiography is a simple noninvasive valuable tool in diagnosing diastolic dysfunction.
- Diabetic patients have higher tendency to develop Diastolic dysfunction which is usually undiagnosed.
- Thus, early Echocardiography is advised in all diabetics to assess the cardiac function

KEYWORDS :

INTRODUCTION :

Indians are genetically more susceptible to diabetes compared to other races. Diabetics are more prone for recurrent stroke. Cardiovascular complications are known to be the main cause of morbidity and mortality in diabetic patient. Diastolic dysfunction represents an early stage of heart failure, without any clinical manifestations. Very few studies have been done in India about HbA_{1c} levels in stroke patients. In the view of these above facts the present study was done to assess the diastolic dysfunction in stroke patients.

METHODS :

A cross-sectional hospital-based study was done which included 50 patients with stroke. Diastolic dysfunction was evaluated by Doppler echocardiography, in relation with age/sex and HbA_{1c} level in these patients. Patients were grouped based on their age group. They were further grouped based on the HbA_{1c} levels as per the guidelines of American diabetic association. Data compiled & analyzed in Microsoft Excel 2013 & Predictive analytics Software (SPSS) Vr. 11. Results shown in Frequencies and proportions. Sample 't' Significance tests applied. All stroke cases admitted in the department of Medicine, ASRAMS, Eluru, Andhrapradesh, India between July 2015 to October 2016 were taken for the study.

INCLUSION CRITERIA:

Stroke patients aged between 30 – 80 years.

EXCLUSION CRITERIA :

Stroke patients below 30 years of age

Ischemic heart disease.

Cardiac arrhythmias.

Cardiomyopathy.

Valvular heart disease.

Heart failure.

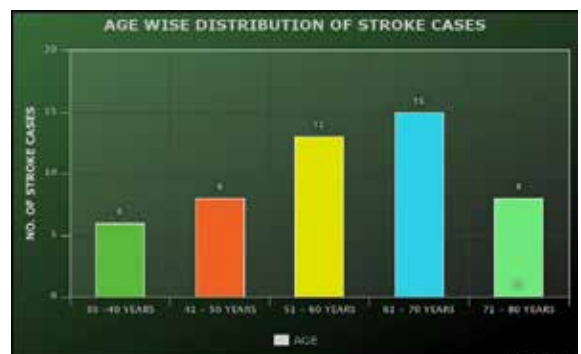
Chronic pulmonary disease.

Chronic renal failure.

Patients with hypertension and valvular heart disease.

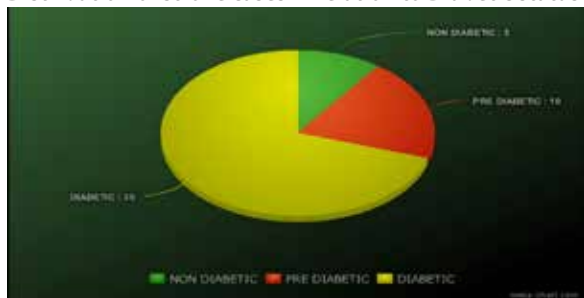
Severe anemia and haemoglobinopathies

RESULTS :

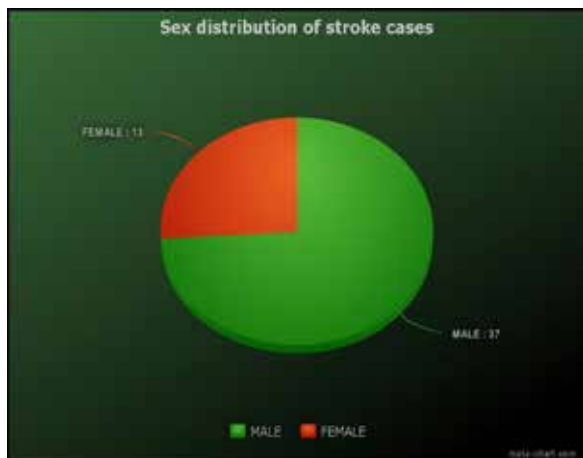


Stroke cases were seen highest among the age group of 50 to 70 years

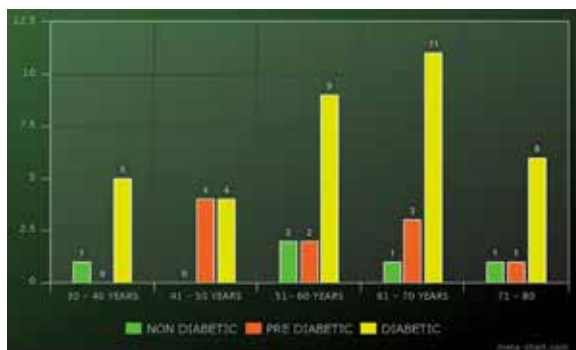
Distribution of stroke cases in relation to Diabetic status



Stroke cases were highest among patients with HbA1c in the diabetic range.



DISTRIBUTION OF STROKE PATIENTS IN RELATION TO AGE GROUP & DIABETIC STATUS

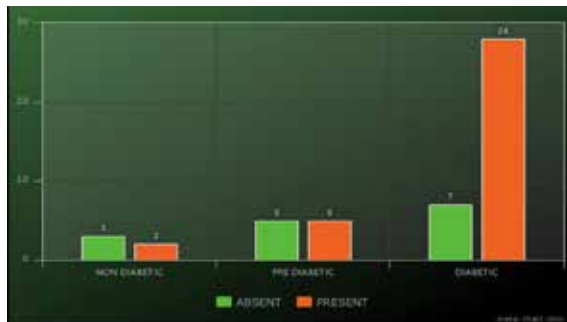


Stroke cases were highest among age group of 51 to 70 years with their HbA1c levels in the diabetic range.

TEST OF SIGNIFICANCE - HbA1C LEVELS.

t	Degree of freedom	Significance (p-value)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
HbA1C	23.238	.000	8.2380	7.526	8.950

HbA1C IN RELATION TO DIASTOLIC DYSFUNCTION IN STROKE PATIENTS



Correlation of HbA1c to diastolic dysfunction - 't' test :
Independent sample 't' test was applied to find out the association between Diastolic dysfunction & HbA1c levels. In Stroke patients with diastolic dysfunction, Mean HbA1C level was 8.73 + 2.6 SD Whereas in patients without diastolic dysfunction, Mean HbA1C level was 6.85 + 1.5 SD.

	t	Degree of freedom	Significance (p-value)
HbA1C	3.180	38	.003

DISCUSSION :

Diabetes Mellitus is associated many complications such as nephropathy, neuropathy, ischemic heart disease, cerebrovascular disease and peripheral vascular diseases. Diabetes is a modifiable risk factor for stroke. Guidelines do not give any specific recommendations regarding diabetes management after stroke, either in terms of HbA1c testing or glycemic control. The HbA1c test measures average blood glucose for the past 2 to 3 months. As per American diabetes Association guidelines they were further grouped into normal, Prediabetic and diabetic groups.

Result	HbA1C
Normal	less than 5.7%
Prediabetes	5.7% to 6.4%
Diabetes	6.5% or higher

HbA1c seems to be a reliable predictor of diastolic dysfunction. Left ventricular diastolic dysfunction is the reversible first stage of diabetic cardiomyopathy preceding changes in systolic function. It has noticed in asymptomatic patients. All patients were further assessed for diastolic dysfunction by echocardiography.

CONCLUSIONS

This Study demonstrated a highly significant (positive) correlation between HbA1c level and frequency of diastolic dysfunction in stroke patients.

Higher HbA1c level is a reliable predictor of diastolic dysfunction in stroke patients.

Hence we recommend HbA1c level as an independent predictor of stroke.

Doppler Echocardiography is a simple non-invasive valuable tool in diagnosing diastolic dysfunction.

Diabetic patients have a higher tendency to develop diastolic dysfunction which is usually undiagnosed.

Thus, early Echocardiography is advised in all diabetics to assess the cardiac function.

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