Original Article

Frequency of Raised HbA1c in Patients Presenting with Ischemic Stroke

Raised HbA1c in Ischemic Stroke

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ABSTRACT

Objective: To determine the frequency of increased level of HbA1c in patients with previously normal blood glucose level within the last 6 months came with ischemic stroke in a tertiary care hospital.
Study Design: Cross-sectional study
Place and Duration of Study: This study was conducted at the Medical indoor of Nishtar Hospital Multan from august 2015 to January 2016.
Materials and Methods: Total 90 patients from medical indoor were selected. Raised HbA1c level was set according to American Diabetes Association criteria.
Results: The patient Mean age was 55.6 ± 12.6 years. The 53.2% of patients were found in the age group range from 61-80 years. Total 90 patients, 59 (66%) were males and 31 (34%) were females. The ratio of male to female was 2: 1 .Out Of the 90 cases, 34 (37%) were with raised HbA1c level while 56 (63%) were with normal HbA1c .In the cases with the raised HbA1c, 20 (60%) cases with raised HbA1c patients were males and 14 (40%) were females. Fifty-six patients had normal HbA1c, 41 (73%) were males and 15 (27%) were females.
Conclusion: There is a significant correlation between HbA1c and stroke in the patients those who have normal blood glucose levels over the past 6 months. HbA1c should be used as a regular screening test because it indicates the chronic status of blood Glucose level with a single blood sugar level. Further researches should be done to explore HbA1c with ischemic stroke that can help us in the better management of Stoke patients in future.
Key Words: ischemic stroke, HbA1c.

Citation of article: Saleem S, Shaheen R, Saher N. Frequency of Raised HbA1c in Patients Presenting With Ischemic Stroke. Med Forum 2017;28(6):78-80.

INTRODUCTION

The rapid development of clinical symptoms of focal or diffuse neurological deficits (limb weakness, loss of sensation, speech, dysphagia) lasted for more than 24 hours with no apparent cause, just vascular findings on CT scan.[1] The symptoms of cerebral ischemia may be transient for a second to a few minutes, or may last longer period of a time[2] which may be due to ischemia caused by obstruction or hemorrhage.[3] The affected area of the brain cannot perform function, which will lead to one or more limbs weakness of the body, unable to understand or develop speech, or cannot see the visual field.[4]

The most important risk factors for stroke are hypertension and atrial fibrillation.[5] Other risk factors include high blood cholesterol, diabetes, cigarette smoking (active and passive),[6] alcohol consumption[7] and drug use[8], lack of physical activity, obesity, red meat consumption[9] and Unhealthy diet[10].

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Received: April 16, 2017; Accepted: May 20, 2017

The stroke by the drug use is mostly due to cocaine, amphetamine causing hemorrhagic stroke.[11]

Stroke is 4th leading causes of death and disability among adults in most of the countries.[12] Men 25% are more likely to suffer from stroke than women[13] .Disability affects 75% of stroke survivors enough to lower their employability[14]. Stroke can affect the body, the spirit, the mood, or the combination of the three. The results of stroke are broadly dependent on the size and location of lesion[15]. The 30 to 50% of stroke survivors have post-stroke depression, which is characterized by lethargy, irritability, sleep disorders, reduced self-esteem and withdrawal[16].

Diabetic patients have more than doubled chances to develop ischemic stroke as compared to the individuals without diabetes. HbA1c levels are proportional to the average blood glucose levels over the previous four weeks to three months.[17] The monitoring of HbA1c in diabetic patients may improve outcome.[18] There are plenty of people, do not know about their elevated HbA1c levels before they have blood lab work.[19] The values of HbA1c ≥ 6.5% is considered as abnormal [20,21] .

There is a strong linked between elevated HbA1c and ischemic stroke shown by a study on Caucasian population. There are also bulge in HbA1c and strong correlation with the ischemic stroke in Caucasian population. The study by the Geberhiwot et al [22]

showed that 23% of patients with normal blood glucose levels had elevated HbA1c level. Establishment of association of HbA1c with stroke; we can prevent this catastrophic disease from causing major mortality and permanent disability.

MATERIALS AND METHODS

This is a cross-sectional study was carried out at Medical indoor of Nishtar Hospital Multan, Punjab over a period of 6 months from august 2015 to January 2016.Ninty patients from medical ward were selected. Raised HbA1c level was set according to American Diabetes Association criteria. Patient with above 20 years of age, ischemic stroke and blood glucose levels normal in the past 6 months were included. All patients taking steroids in the long run, patients with neurological dysfunction due to occupying lesions and meningitis or encephalitis were excluded. The data was analyzed by SPSS v 21.

RESULTS

The patients Mean age was 55.6 ± 12.6 years. 53.2% of patients were found in the age group range of 61-80 (Table 1). Total 90 patients, 59 (66%) were males and 31 (34%) were females. The ratio of male to female is was 2: 1 (Table 2). Of the 90 cases, 34 (37%) had raised HbA1c level while 56 (63%) were with normal HbA1c (Table 3). In the cases with the raised HbA1c, 20 (60%) cases with raised HbA1c patients were males and 14 (40%) were females. (Table 4). Fifty-six patients had normal HbA1c, 41 (73%) were males and 15 (27%) were females. (Table 5).

Table No. 1: Distribution of Patients with age

Age	Frequency	Percentage
20-40	10	11.11
41-60	32	35.56
61-80	48	53.2

Table No. 2: Distribution of Patients according to Sex

Sex	Frequency	Percentage
Male	59	65
Female	31	35
Male: Female Ratio		2:1

Table No. 3: Distribution of Patients according to HbA1c

HbA1c	Frequency	Percentage
Raised	34	37
Normal	56	63

Table No. 4: Gender Distribution according to HbA1c

Gender	Frequency	Percentage
Males	41	73
Females	15	27

Table No. 5: Gender Distribution according to normal HbA1c

Gender	Frequency	Percentage
Male	20	60
Female	14	40

DISCUSSION

Diabetic patients are at double risk of ischemic stroke as compared to non diabetic after correction of other associated risk factors. Many cohort studies have investigated the relationship between blood glucose levels and stroke and associated with the relationship between the fasting blood glucose levels and the postprandial blood glucose levels linked with stroke.[23] However, previous studies of fasting plasma glucose levels and prevalence of strokes in non-diabetic showed mixed results, [24] This may be due to a single glucose measurement with high self-alteration, is not a measure of a person's chronic hyperglycemia, especially in people without dominant diabetes.

HbA1c levels is accurate and is accurate to measure the risk of chronic blood glucose levels and more closely related complications than single or sequential blood glucose levels. The patient presented to us does not represent the population or class of a particular region; however, the majorities are of moderate or lower socioeconomic status. We investigated total 84 patients of ischemic stroke and identified the frequency of HbA1c in these patients.

We compare our findings with other international published data. The study by the Geberhiwot et al[22] in 2004 showed that 23% of patients with normal blood glucose levels had high HbA1c level, which was 34% in our study. The study of HG et al in non-diabetic patients with elevated HbA1c is associated with an odd number of ischemic strokes (9.59 odd's ratio).[25] According to a case-control study, HbA1c> 6.5% was associated with odds ratio of 2.95 for stroke.[26] According to a cohort study with a HbA1c > 7% associated with a relative risk of 2.83 odds ratio of stroke[27]. Elevated levels of chronic hyperglycemia indicated by HbA1c are associated with an increased risk of stroke by 17% for each 1% of elevation of HbA1c[28].Our study showed a positive relationship between raised HbA1c and ischemic stroke.

CONCLUSION

There is a significant correlation between HbA1c and stroke in the patients those who have normal blood glucose levels over the past 6 months. HbA1c should be used as a regular screening test because it indicates the chronic status of blood Glucose level with a single blood sugar level. Further researches should be done to explore HbA1c with ischemic stroke that can help us in the better management of Stoke patients in future.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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