ORIGINAL ARTICLE

Frequency of Hypoalbuminemia in patients with Ischemic Stroke

RIAZ AHMED JAVID[1], AZIZULLAH BHATTI[2], MUNIR AHMAD AZHAR[3]

ABSTRACT

Aim: To find out the frequency of Hypoalbuminemia in patients with ischemic stroke.
Methods: This cross sectional study was conducted at Department of Medicine, Dera Ghazi Khan Hospital, Dera Ghazi Khan from November 2015 to May 2016. Total 382 patients with ischemic stroke either male or female having age from 40 to 60 years were selected for this study.
Results: Mean age of the patients was 50.89±5.876 years, Mean duration of symptoms was 5.24±2.768 days. Male patients were 232(60.7%) and female patients were 150(39.3%). Total 154 (40.3%) patients belonged to age group 40-50 years and 228(59.7%) patients belonged to age group 51-60 years, 129(33.8%) patients were hypertensive, 161(42.1%) patients were found with raised serum cholesterol levels, 163(42.7%) patients were diabetics. No association of hypoalbuminemia with age, gender, raised cholesterol level, hypertension and diabetes was seen.
Conclusion: Results of this study showed a higher percentage of hypoalbuminemia in patients with ischemic stroke. Male were more victim of ischemic stroke as compare to female but insignificant association of hypoalbuminemia with gender is noted. Results of this study also revealed that there is insignificant association of hypoalbuminemia with age and hypertension.
Keywords: Hypertension, hypoalbuminemia, diabetes mellitus, ischemic stroke

INTRODUCTION

A stroke, sometimes referred to as a cerebrovascular accident (CVA) is the loss of functions of brain due to disturbance in supply ofblood to brain. This disturbance is due to either ischemia or hemorrhage[1]. Ischemia is caused by eitherarterial embolism or blockage of a blood vessel via thrombosis or by cerebral hypoperfusion[2]. About 800,000 individuals suffer from strokes every year in USA, 82% to 92% of these strokes are ischemic[3]. Furthermore, 20% to 40% of cases with ischemic infarction may develop hemorrhagic transformation within one week after ictus[4]. Differentiating between these different types of stroke is an essential part of the initial workup of these patients because the subsequent management of each patient is vastly different[5].

Hypoalbuminemia is a predictive factor for several clinical outcomes (recurrences, functional recovery and medical complications) and mortality in patients with stroke[6]. Low serum albumin level is frequently found in hospitalized patients. Hypoalbuminemia was reported in up to 19% of stroke patients[7].

The exact frequency of Hypoalbuminemia in patients with ischemic stroke is not known as insufficient local data exists. So the objective of our study is to find out the frequency of hypoalbuminemia in patients with ischemic stroke. Results of this may help us to determine the exact magnitude of this problem which may guide us in better management to decrease the mortality and morbidity related to it.

[1]Associate Professor Medicine, Ghazi Khan Medical College, Dera Ghazi Khan
[2]Associate Professor Physiology, Quaid-e-Azam Medical College, Bahawalpur
[3]Associate Professor Medicine, QAM C, Bahawalpur
Correspondence to Dr. Riaz Ahmed Javid

MATERIAL AND METHODS

This cross sectional study was conducted at Department of Medicine, Dera Ghazi Khan Hospital, Dera Ghazi Khan from November 2015 to May 2016. Total 382 patients with ischemic stroke either male or female having age from 40 to 60 years were selected. Patients with decompensated cirrhosis of liver (ultrasound findings of cirrhosis, portal hypertension, ascites, splenomegaly), Nephrotic syndrome (proteinuria (>3.5gm/day), hypo albuminemia (<3.5g/dl), hyper-cholestrolemia >200mg/dl and pitting edema.), Hemotoma on CT scan brain and Protein losing enteropathy were excluded from the study.Ischemic stroke was defined as: Patients having hypodense area (infarction) on plain CT scan Brain in the respective vascular territory along with anyone of these: Abnormal reflexes, inability to speak, decreased sensation, loss of balance, mental function problems (irritability and behavioural changes), vision changes (decreased visual acuity <6/6), walking problems (power < 5/5) and weakness within 36 hours of onset.
Study is approved ethically by institutional review board. Written informed consent was taken from every patient. Five ml fasting blood sample within 36 hours of onset of stroke was drawn and send to the laboratory for serum albumin. Findings were noted in

term of hypoalbuminemia (Yes/No) on predesigned proforma. Hypoalbuminemia was labelled when serum albumin level <35 g/l. Demographic data like age, gender was also entered in predesigned Performa.

Data were entered on computer software SPSS version 16. Mean±SD was calculated for age and duration of symptoms as quantitative variable. Qualitative variable like gender, hypertension and hypoalbuminemia was presented as frequencies and percentage. Stratification was done for age, gender, hypertension and duration of symptoms. Post stratification chi-square test was applied to see the effect of these on outcome variable i.e., hypoalbuminemia. P-value ≤ 0.05 was considered as significant.

RESULTS

Total 382 patients with ischemic stroke were included in this study. Mean age of the patients was 50.89 ± 5.876 years, mean duration of symptoms was 5.24 ± 2.768 hours. Out of 382 patients hypoalbuminemia was seen in 160 (42%) patients (Fig. 1).

Stratification for age was done and two groups was made, age group 40-50 years and age group 51-60 years. In age group 40-50 years, out of 154(40.31%) patients, hypoalbuminemia was seen in 70 (45.45%) patients. In age group 51-60 years out of 228(59.69%) patients, hypoalbuminemia was seen in 90 (39.47%) patients. Insignificant (P = 0.2474) association between age and hypoalbuminemia was noted. (Table 1).

Out of 232(60.73%) male patients, hypoalbuminemia was seen in 101(43.53%) patients and out of 150(39.27%) female patients hypoalbuminemia was seen in 5(39.33%) patients. Insignificant (P=0.4577) association of hypoalbuminemia with gender was noted (Table 2).

In patients with 1-18 hours of duration of symptoms, hypoalbuminemia was noted in 82(41.41%) patients and in patients with 19-36 hours duration of symptoms, hypoalbuminemia was observed in 78(42.39%) patients. Insignificant (P=0.9174) association between duration of symptoms and hypoalbuminemia was observed (Table 3).

As shown in table 4, out of 129(33.77%) hypertensive patients, hypoalbuminemia was seen in 59 (45.74%) patients and out of 253(66.23%) normotensive patients, hypoalbuminemia was seen in 101(39.92%) patients. Insignificant (P=0.3238) association was seen between hypertension and hypoalbuminemia was noted

Fig. 1: Frequency for Hypoalbuminemia

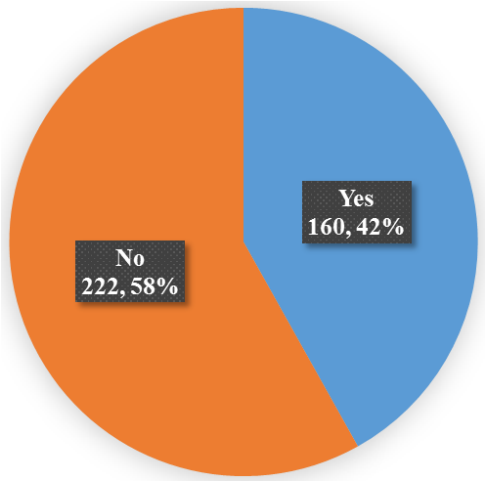

Table 1: Stratification for age

Age	Hypoalbuminemia		Total
	Yes	No	
40-50	70(45.45%)	84(54.54%)	154(40.31%)
51-60	90(39.47%)	138(60.52%)	228(59.69%)
Total	160(42%)	222(58%)	382

P value 0.2474

Table 2: Stratification for Gender

Gender	Hypoalbuminemia		Total
	Yes	No	
Male	101(43.53%)	131(56.47%)	232(60.73%)
Female	59(39.33%)	91(60.67%)	150(39.27%)
Total	160(42%)	222(58%)	382

P value 0.4577

Table 3: Stratification for duration of symptoms

Duration of symp-toms(Hrs)	Hypoalbuminemia		Total
	Yes	No	
1-18	82(41.41%)	116(58.59%)	198(51.83%)
19-36	78(42.39%)	106(57.61%)	184(48.17%)
Total	160(42%)	222(58%)	382

P value 0.9174

Table 4: Stratification for hypertension

Hyper-tension	Hypoalbuminemia		Total
	Yes	No	
Yes	59(45.74%)	70(54.26%)	129(33.77%)
No	101(39.92%)	152(60.08%)	253(66.23%)
Total	160(42%)	222(58%)	382

P value 0.3238

DISCUSSION

Stroke is the 3rd leading cause of death in USA. About 700000 individuals are affected by stroke in western world every year[8]. The rate of in hospital mortality varies between 3% to 5% according to stroke type[9]. Generally it is believed that early death

after stroke is mainly attributable to the disease itself, whereas the death after acute phase is due to the hospitalization and the related complications during this period[10]. Hypoalbuminemia may be an indirect marker of systemic conditions such as malnutrition and patients with low albumin level may have other underlying chronic medical or neurologic conditions that impair their ability to recover from acute stroke. Alternatively, low levels of albumin at time of acute stroke may simply be indicative of role of the albumin as a negative acute phase reactant whose concentration decreases during acute inflammatory states. Despite its importance, hypoalbuminemia has not been widely evaluated as a predictor of mortality after acute stroke[11].

In present study hypoalbuminemia was noted in 42% patients with ischemic stroke. In one study by Dziedzic et al[7] frequency of Hypoalbuminemia was found in 45.5% patients which is in agreement with our study. Vahedi A et al[12] reported decreased serum albumin (<35g/l) levels in 43% patients of ischemic stroke. Chen Y et al[13] studied serum albumin levels in 70 patients of ischemic stroke and observed Hypoalbuminemia in 56% patients.

We found high frequency of hypoalbuminemia in acute stroke patients. Some previous studies reported significantly lower frequency of hypoalbuminemia in stroke patients. In one study Davalos et al[14] assessed malnutrition in 104 patients with acute ischemic and hemorrhagic stroke. Serum albumin level was measured within 24 hours after stroke onset, and hypoalbuminemia (serum albumin level <35 g/l) was observed in 7.7% of patients.

Gariballa et al[15] found serum albumin concentration <35g/l in 19% from 201 ischemic stroke patients. In that study, serum albumin level was measured within 48 h after stroke onset.

Davis et al[16] measured serum albumin concentration in 185 patients with cerebral infarction and intracerebral hemorrhage within 24hr after stroke onset. They found hypoalbuminemia (serum albumin level (<34g/l) in 16.2% of patients. Dzieniszewski et al[17] also reported frequency of hypoalbuminemia in ischemic stroke patients as 20.7%.

CONCLUSION

Results of this study showed a higher percentage of hypoalbuminemia in patients with ischemic stroke. Male were more victim of ischemic stroke as compare to female but insignificant association of hypoalbuminemia with gender is noted. Results of this study also revealed that there is insignificant association of hypoalbuminemia with age and hypertension.

REFERENCES

1. Sims NR, Muyderman H. Mitochondria, oxidative metabolism and cell death in stroke. Biochimica et Biophysica Acta. 2009;1802(1):80–91.
2. Fonarow GC, Saver JL, Smith EE, Broderick JP, Kleindorfer DO, Sacco RL, et al. Relationship of national institutes of health stroke scale to 30-day mortality in medicare beneficiaries with acute ischemic stroke. *J Am Heart Assoc*. 2012;1(1):42-50.
3. Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, et al. Heart disease and stroke statistics--2012 update: a report from the American Heart Association. *Circulation.* 2012;125(1):e2-e220.
4. Mullins ME, Lev MH, Schellingerhout D, Gonzalez RG, Schaefer PW. Intracranial hemorrhage complicating acute stroke: how common is hemorrhagic stroke on initial head CT scan and how often is initial clinical diagnosis of acute stroke eventually confirmed?. *AJNR Am J Neuroradiol.* Oct 2005;26(9):2207-12.
5. Nighoghossian N, Hermier M, Adeleine P, Blanc-Lasserre K, Derex L, Honnorat J. Old microbleeds are a potential risk factor for cerebral bleeding after ischemic stroke: a gradient-echo T2-weighted brain MRI study. *Stroke.* Mar 2002;33(3):735-42.
6. Lázaro VA, del Ser Quijano T, Martín RB. Hypoalbuminemia and other prognostic factors of mortality at different time points after ischemic stroke. Nutr Hosp. 2013;28(2):456–63.
7. Dziedzic T, Pera J, Slowik A, Gryz-Kurek EA, Szczudlik A. Hypoalbuminemia in acute ischemic stroke patients: frequency and correlates. Eur J Clin Nutr. 2007;61(11):1318–22.
8. Members WG, Thom T, Haase N, Rosamond W, Howard VJ, Rumsfeld J, et al. Heart Disease and Stroke Statistics—2006 Update A Report From the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Circulation. 2006 Feb 14;113(6):e85–151.
9. Liebeskind DS, Kidwell CS, Sayre JW, Saver JL. Evidence of publication bias in reporting acute stroke clinical trials. Neurology. 2006 Sep 26;67(6):973–9.
10. Famakin B, Weiss P, Hertzberg V, McClellan W, Presley R, Krompf K, et al. Hypoalbuminemia predicts acute stroke mortality: Paul Coverdell Georgia Stroke Registry. J Stroke Cerebrovasc Dis. 2010 Jan;19(1):17–22.
11. Ebersole JL, Cappelli D. Acute-phase reactants in infections and inflammatory diseases. Periodontol 2000. 2000 Jun;23:19–49.
12. Vahedi A, Lotfinia I, Sad RB, Halimi M, Baybordi H. Relationship between admission hypoalbuminemia and inhospital mortality in acute stroke. Pak J Biol Sci. 2011 Jan 15;14(2):118–22.
13. Chen Y, Li S, Sun F, Liu Y, Hu W. Monitoring of medical complications after acute ischemic stroke in a neurological intensive care unit. Eur Neurol. 2011;66(4):204–9.
14. Dávalos A, Ricart W, Gonzalez-Huix F, Soler S, Marrugat J, Molins A, et al. Effect of Malnutrition After Acute Stroke on Clinical Outcome. Stroke. 1996 Jun 1;27(6):1028–32.
15. Gariballa SE, Parker SG, Taub N, Castleden CM. Influence of nutritional status on clinical outcome after acute stroke. Am J Clin Nutr. 1998 Aug;68(2):275–81.
16. Davis JP, Wong AA, Schluter PJ, Henderson RD, O'Sullivan JD, Read SJ. Impact of premorbid undernutrition on outcome in stroke patients. Stroke. 2004 Aug;35(8):1930–4.
17. Dzieniszewski J, Jarosz M, Szczygieł B, Długosz J, Marlicz K, Linke K, et al. Nutritional status of patients hospitalised in Poland. Eur J Clin Nutr. 2005 Apr;59(4):552–60.