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Research Article

Post-Stroke Seizure in Benghazi

Rabha Elsahli* and Mohammed FG Elshukri

Benghazi University, Libya

***Corresponding Author:** Rabha Elsahli, Benghazi University, Libya.

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Abstract

Introduction: Stroke is the most common cause of seizures in the elderly, and seizures are among the most common neurologic sequelae of stroke. About 10% of all stroke patients experience seizures, from stroke onset until several years later.

Aim: To evaluate the frequency and predictive factors of early and late seizures after stroke.

Methodology: A retrospective analysis (Cross-sectional study)

Data collection: Data was collected in pre-designed proforma subsequently, the data was entered into the computer.

Data analysis: The results were analyzed using SPSS version 22 for Windows.

Results: The study included 102patients with stroke, their mean age was70.1 ± 12.2years. Seizure was recorded in 45(44.1%**).** Onset of seizure was early in 15.6% and late in 84.4%. History of ischemic heart disease was recorded in 39.2%of-patients. History of hypertension was positive in 79.4%, while diabetes was present in 69.6%. Hyperlipidemia was present in 51%. Almost the seizure was-recorded similar in all age groups, and it was-highest in age group(61-70 years) 48.5%,and lowest in >80 years, the difference-was not-statistically significant. Mean age of-patients-with seizure-was 68.7 ± 11.3, while mean age of patients without seizure was 71 ± 12.9years, the difference between the means was not statistically significant p=0.404 Seizure was recorded 43.5% of males and 45% of females, this difference was not significant. All-patients with seizure had history of hypertension. History of diabetes was recorded in77.8% 0f patients with seizure. Ischemic heart disease was present in 26.7% of patients with seizure. Ischemic heart disease-was-recorded-in100% of patients aged >80 years, and lowest was in age-group-51-60 years (18.8%),followed by-age-group, 61-70 years 24.2%,than ≤50 years was.33.3% and 71-80 years was 34.8%, these difference was statistically significant p –value was 0.0001.Ischemic heart disease was recorded in 44.1% of males and 36.8% of females, this difference was not statistically significant p = 0.621. Early onset of seizure was recorded in 11.7% of patients who had ischemic heart disease and 17.9% in patients not suffering ischemic heart disease, late onset was recorded in 83.3% of patients with ischemic heart disease and 82.1% of patients without ischemic heart disease this difference was not statistically significant p value was 0.716. Hypertension was present in 72.5% of patients with ischemic heart disease and 27.5% of patients with ischemic heart disease had no hypertension, while 82.5% of patients without ischemic heart disease had hypertension and 17.5% had no hypertension nor ischemic heart disease, this difference was not statistically significant p value = 0.241.

Recommendation: Increased awareness of post-stroke seizures may be important in improving outcomes following the stroke. Further research is needed as a cohort study to know more information about post-stroke seizures.

Keywords: Seizure; Post-Stroke; Benghazi

Introduction

Medical complications are believed to be an important problem after acute stroke and present potential barriers to optimal recovery. Several previous studies have suggested that complications not only are common, with estimates of frequency ranging from 40% to 96% of patients but also are related to poor outcomes. Many of the complications described are potentially preventable or treatable if recognized [1].

Post-stroke seizure and post-stroke epilepsy are common causes of hospital admissions, either as a presenting feature or as a complication after a stroke. They require appropriate management and support in the long term. With an increasingly aging population and age itself being an independent risk factor for stroke, the incidence and prevalence of post-stroke seizure and post-stroke epilepsy are likely to increase [2].

Stroke incidence increases with advancing age. Cerebrovascular disease is the number one cause of epilepsy in the elderly population [3].

In a study of an unselected population of over 2 million people in England and Wales, Wallace and colleagues found that both age-specific incidence and prevalence of epilepsy are higher in older people [4].

Seizures secondary to stroke have been recognized for many years and are considered by some authorities as a major cause of epilepsy in the elderly. Although the frequency of seizures after stroke is variously estimated at 4% to 10%, many of these data were based on retrospective studies with variable follow-up, often without computed tomographic (CT) confirmation of the lesion, or on patient numbers so small that no reliable statistical analysis was possible. Often included were patients with arteriovenous malformations, brainstem strokes, subarachnoid hemorrhage, or a previous history of seizures or epilepsy. Previous assumptions such as seizures being more frequent in cerebral hemorrhage or cardioembolic stroke are not reliably evidence-based [5].

Aim

To evaluate the frequency and risk factors of early and late seizures after stroke.

Scope and limitation

- A retrospective study from a patient's registration file in the neurology clinic and from the neurology outpatient department at Benghazi Medical Center.
- Need frequent investigation screens of metabolic like dyslipidemia and radiological imaging.
- Need matched controls study.

Methodology

- A retrospective analysis (Cross-sectional study)
- All records of patients with stroke from patients' registration files in the neurology clinic and neurology outpatients department at Benghazi Medical Center.
- The main outcome measures will be the occurrence of single or recurrent seizures as well as the occurrence of both early (within 2 weeks) and late (after 2 weeks) seizures were recorded.

Data collection

Data will be collected in pre-designed proforma subsequently the data will be entered into the computer (Appendix I).

Data analysis

The results will be analyzed by using SPSS (Statistical Package for Social Sciences) version 22 for Windows. Descriptive statistics will be generated with percentages for discrete variables and means and standard deviations for continuous variables.

Categorical variables will be analyzed by using the Chi-Square test while continuous variables will be analyzed by using the student's *t*-test. A p-value of <0.05 will be considered significant. Data will be presented in tables and figures, figures will be done by Microsoft Excel 2010.

Results

Age /year	No.	%
≤50	7	6.9
51 – 60	18	17.6
61-70	33	32.4
71- 80	23	22.5
81-90	16	15.7
>90	5	4.9
Total	102	100

Table 1: Distribution of patients according to age.

Mean age =70.1years. Std. Deviation =12.2years. Median=69years
Minimum age=43 years. Maximum = 98 years.

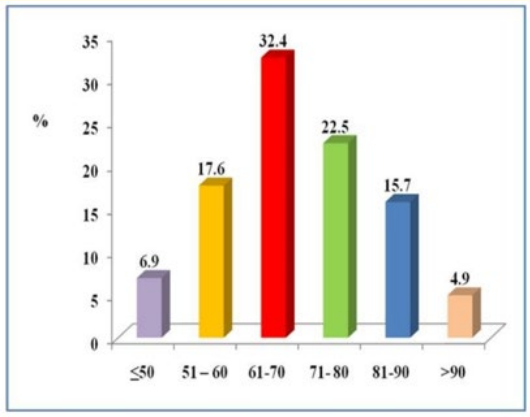

Figure 1: Distribution of patients according to age.

Mean age =70.1years. Std. Deviation =12.2years. Median=69years Minimum age=43 years. Maximum = 98 years.

Sex	No.	%
Male	62	60.8
Female	40	39.2
Total	102	100

Table 2: Distribution of patients according to sex.

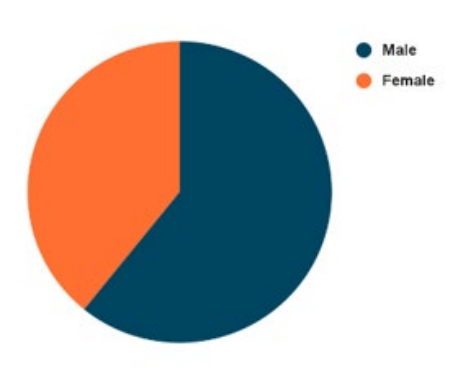

Figure 2: Distribution of patients according to sex.

Seizure	No.	%
Yes	45	44.1
No	57	55.9
Total	102	100

Table 3: Distribution of patients according to seizure.

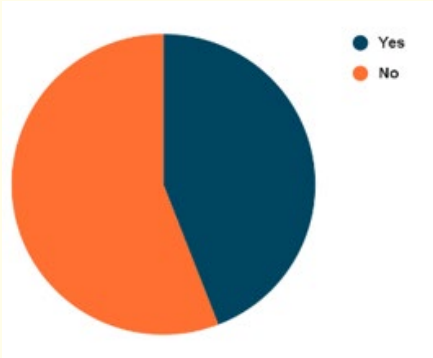

Figure 3: Distribution of patients according to seizure.

Onset of seizure	No.	%
Early	7	15.6
Late	38	84.4
Total	45	100

Table 4: Distribution of patients according to onset of seizure.

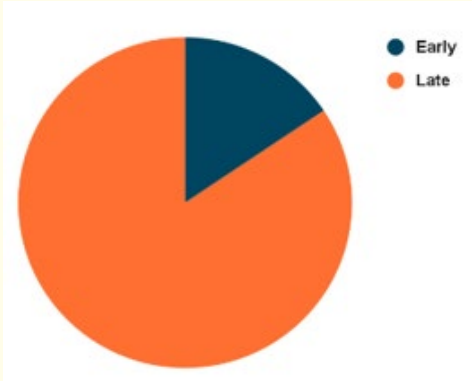

Figure 4: Distribution of patients according to onset of seizure.

History of ischemic heart disease	No.	%
Yes	40	39.2
No	57	55.9
Not recorded	5	4.9
Total	102	100

Table 5: Distribution of patients according to history of ischemic heart disease.

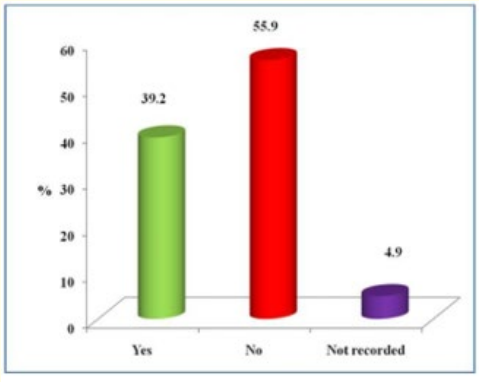

Figure 5: Distribution of patients according to history of ischemic heart disease.

History of hypertension	No.	%
Yes	81	79.4
No	21	20.6
Total	102	100

Table 6: Distribution of patients according to history of hypertension.

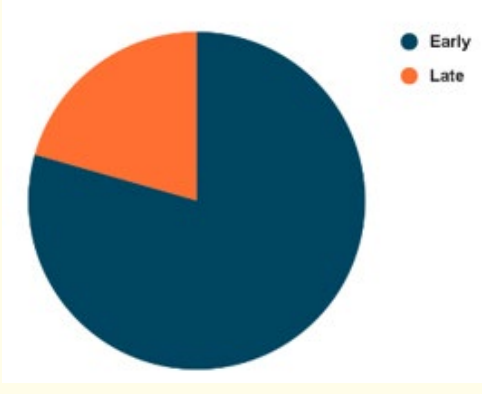

Figure 6: Distribution of patients according to history of hypertension.

History of diabetes	No.	%
Yes	71	69.6
No	31	30.4
Total	102	100

Table 7: Distribution of patients according to history of diabetes.

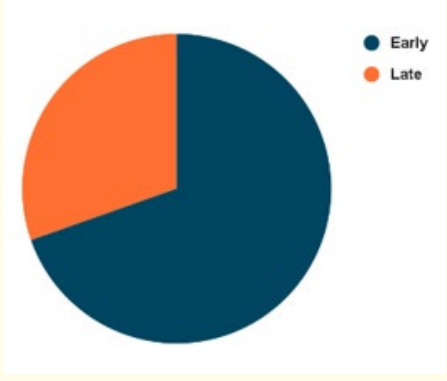

Figure 7: Distribution of patients according to history of diabetes.

History of hyperlipidemia	No.	%
Yes	52	51
No	31	30.4
Not recorded	19	18.6
Total	102	100

Table 8: Distribution of patients according to history of hyperlipidemia.

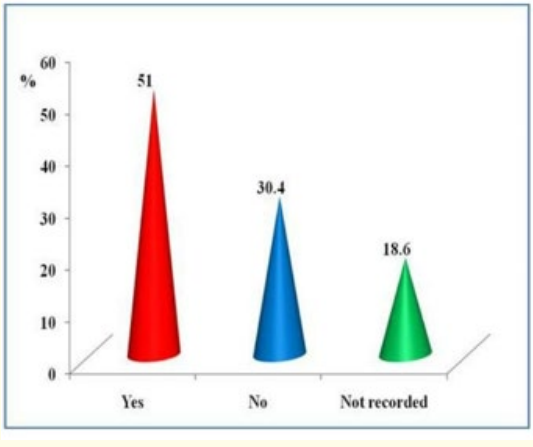

Figure 8: Distribution of patients according to history of hyperlipidemia.

Age/year	Seizure			
	Yes		No	
	No.	%	No.	%
≤50	3	42.9	4	57.1
51 – 60	8	44.4	10	55.6
61-70	16	48.5	17	51.5
71- 80	11	47.8	12	52.2
>80	7	33.3	14	66.7
Total	45	44.1	57	55.9

Table 9: Distribution of patients according to Seizure and age.

X_2 = 1.380, df = 4, p = 0.848 (Not significant)

Seizure: Mean age = 68.7years. Std. Deviation = 11.3years. Median = 67years

Minimum age = 49 years. Maximum = 92 years.

No-Seizure: Mean age = 7 1years. Std. Deviation =12.9years. Median = 70 years

Minimum age = 43 years. Maximum = 98 years.

t = -0.839 with 100 degrees of freedom; P = 0.404 (Not significant)

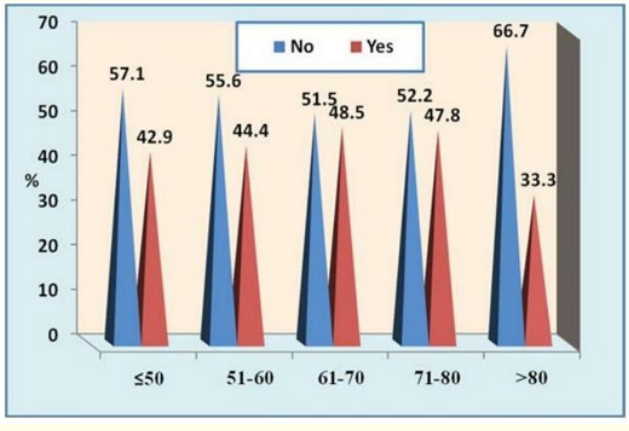

Figure 9: Distribution of patients according to Seizure and age.

Sex	Seizure			
	Yes		No	
	No.	%	No.	%
Male	27	43.5	35	56.5
Female	18	45	22	55
Total	45	44.1	57	55.9

Table 10: Distribution of patients according to Seizure and sex.

X_2 = 0.021, df =1, p = 0.885(Not significant).

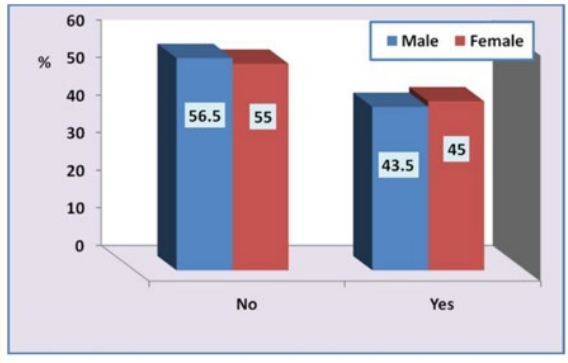

Figure 10: Distribution of patients according to Seizure and sex.

History of hypertension	Seizure			
	Yes		No	
	No.	%	No.	%
Yes	45	100	36	63.2
No	0	0	21	36.8
Total	45	100	57	100

Table 11: Distribution of patients according to Seizure and history of hypertension.

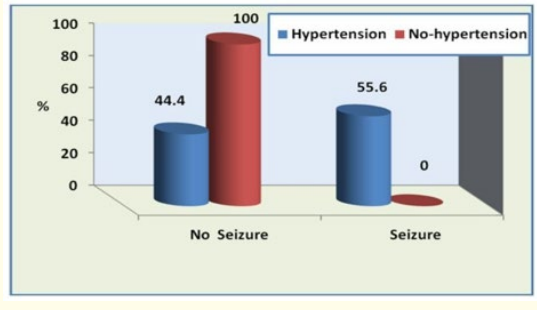

Figure 11: Distribution of patients according to Seizure and history of hypertension

History of diabetes	Seizure			
	Yes		No	
	No.	%	No.	%
Yes	35	77.8	36	63.2
No	10	22.2	21	36.8
Total	45	100	57	100

Table 12: Distribution of patients according to Seizure and history of diabetes.

X_2 = 2.541, df = 1, p = 0.111 (Not significant).

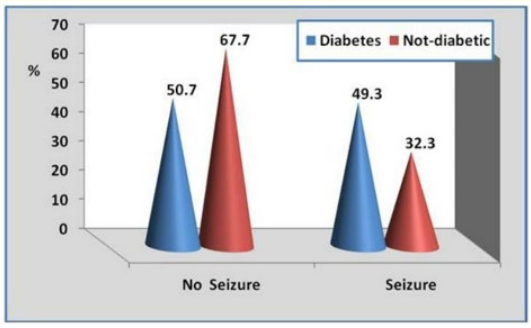

Figure 12: Distribution of patients according to Seizure and history of diabetes.

Hyperlipidemia	Seizure			
	Yes		No	
	No.	%	No.	%
Yes	0	0	52	91.2
No	31	68.9	0	0
Not recorded	14	31.1	5	8.8
Total	45	100	57	100

Table 13: Distribution of patients according to Seizure and hyperlipidemia.

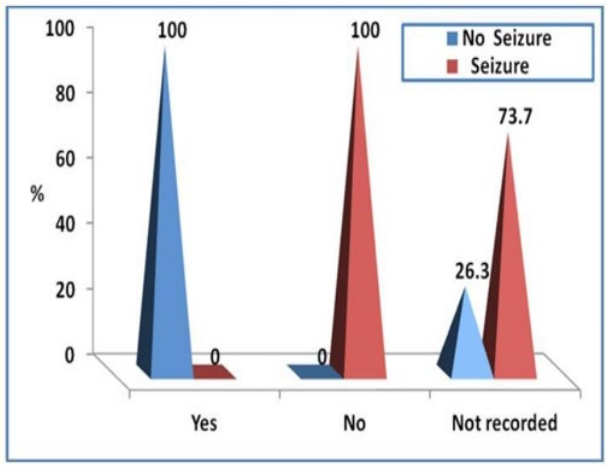

Figure 13: Distribution of patients according to Seizure and hyperlipidemia.

Ischemic heart disease	Seizure			
	Yes		No	
	No.	%	No.	%
Yes	12	26.7	28	49.1
No	28	26.2	29	50.9
Not recorded	5	11.1	0	0
Total	45	100	57	100

Table 14: Distribution of patients according to Seizure and ischemic heart disease.

X_2 = 10.146, df = 2, p = 0.006 (Significant).

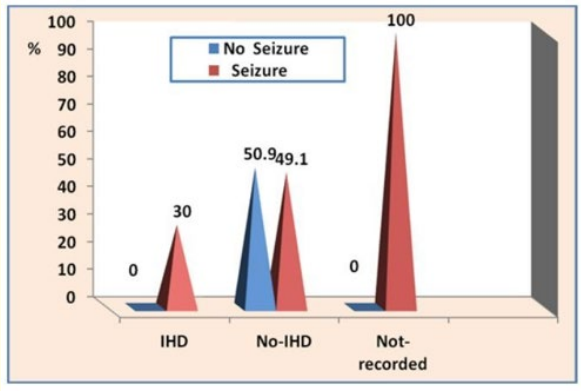

Figure 14: Distribution of patients according to Seizure and ischemic heart disease.

Age/year	Ischemic heart disease			
	Yes		No	
	No.	%	No.	%
≤50	2	33.3	4	66.7
51 – 60	3	18.8	13	81.2
61-70	8	24.2	25	75.8
71- 80	8	34.8	15	65.2
>80	19	100	0	0
Total	40	41.2	57	58.8

Table 15: Distribution of patients according to ischemic heart disease and age.

X_2 = 43.897, df = 4, p = 0.000 (Highly significant).

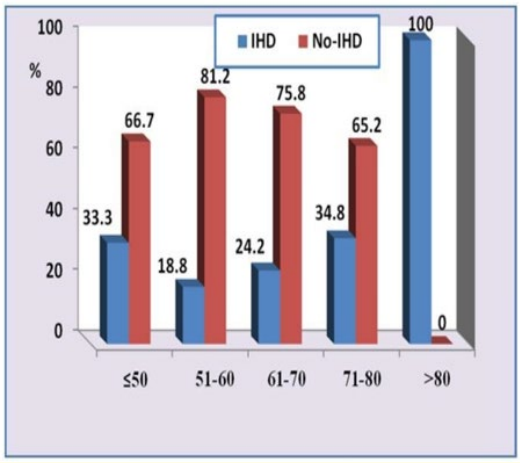

Figure 15: Distribution of patients according to ischemic heart disease and age.

Sex	Ischemic heart disease			
	Yes		No	
	No.	%	No.	%
Male	26	44.1	33	55.9
Female	14	36.8	24	63.2
Total	40	41.2	57	58.8

Table 16: Distribution of patients according to sex and ischemic heart disease.

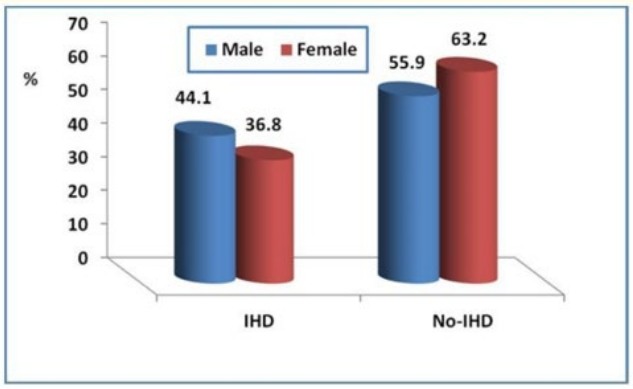

Figure 16: Distribution of patients according to sex and ischemic heart disease.

Onset of seizure	Ischemic heart disease			
	Yes		No	
	No.	%	No.	%
Early	2	11.7	5	17.9
Late	10	83.3	23	82.1
Total	12	100	28	100

Table 17: Distribution of patients according to ischemic heart disease.

X_2 = 0.132, df = 1, p = 0.716 (Not Significant).

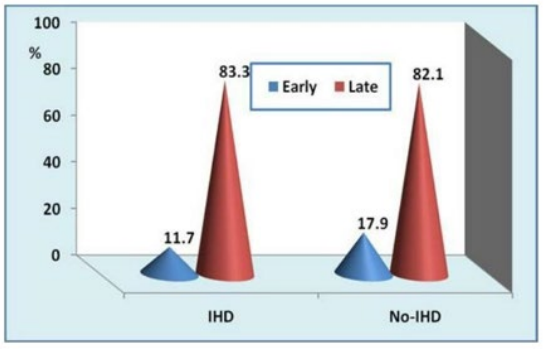

Figure 17: Distribution of patients according to ischemic heart disease.

Hypertension	Ischemic heart disease			
	Yes		No	
	No.	%	No.	%
Yes	29	72.5	47	82.5
No	11	27.5	10	17.5
Total	40	100	57	100

Table 18: Distribution of patients according to hypertension and ischemic heart disease.

X_2 = 1.374, df = 1, p = 0.241 (Not Significant).

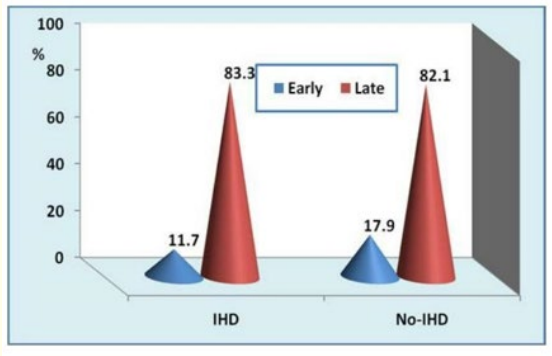

Figure 18: Distribution of patients according to hypertension and ischemic heart disease.

Diabetes	Ischemic heart disease			
	Yes		No	
	No.	%	No.	%
Yes	25	62.5	42	73.7
No	15	37.5	15	26.3
Total	40	44.1	57	55.9

Table 19: Distribution of patients according to diabetes and ischemic heart disease.

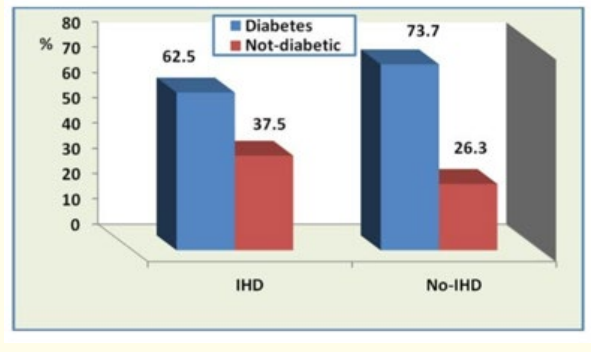

Table 19: Distribution of patients according to diabetes and ischemic heart disease.

Hyperlipidemia	Ischemic heart disease			
	Yes		No	
	No.	%	No.	%
Yes	28	70	24	42.1
No	8	20	18	31.6
Not recorded	4	10	15	26.3
Total	40	44.1	57	55.9

Table 20: Distribution of patients according to hyperlipidemia and ischemic heart disease.

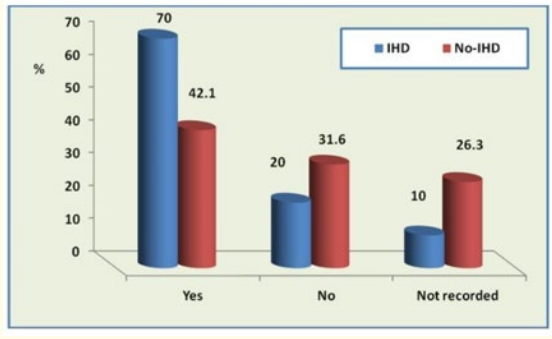

Table 20: Distribution of patients according to hyperlipidemia and ischemic heart disease.

Discussions

The study included 102 patients with stroke, their mean age was 70.1 ± 12.2 years, the minimum age was

43 years and the maximum age was 98 years more than half (54.9%) their age between (61-80year), also in a similar study Mean ± SD patient age was 72.0 ± 11.5 years, and 5 in the other study, the age ranged from 32 to 92 years 11 and in the other study the mean age was 71 years 9 Males constitute to 60.8%, similar to other study males constitute to 66.5%, also in other study men were 57% [9]. Seizure was recorded in 44.1% in other study 11.1% of patients developed seizures [11]. Also, in other 3 studies reported the rates of post stroke seizure as 9% [13], 14% [14]. and 19% [15], respectively. The onset of seizure was early in 15.6% and late in 84.4%, while in the other study, 53% were early onset and late onset 47% [11]. History of ischemic heart disease was recorded in 39.2% of patients, while 4.9% was not recorded. History of hypertension was positive in 79.4%. History of diabetes was recorded in 69.6%. History of Hyperlipidemia was present in 51%, while 18.6% was not recorded. Almost all the seizures were recorded similar in all age groups, and it was highest in age group (61-70) 48.5% and lowest in >80 years, the difference was not statistically significant p-value=0.848, in-other-study no difference between seizure and non seizure groups according to-age [5].

Mean age of patients with seizure was 68.7 ± 11.3, with minimum age 49 and maximum 92years, while mean age of patients without seizure was 71 ± 12.9 years, minimum age was 43 years and maximum were 98 years, the difference between the means was not statistically significant p = 0.404. Seizures was recorded in 43.5% of males and 45% of females, this difference was not significant, p-value = 0.0885, in-other-study no difference between seizure and non seizure groups according to sex [5].

All patients with seizure had history of hypertension and 63.2% of patients without seizure had hypertension, this difference was statistically significant, p-value = 0.0001, in other study 77% of patients with seizure had hypertension [16].

History of diabetes was recorded in 77.8% of patients with seizure, while 63.2% of patients without seizures had diabetes, this difference was not statistically significant p-value = 0.111,in other study diabetes was recorded in 26% of patients with seizure.16 No one of patients with seizure had hyperlipidemia but 91.2% of patients without seizure had hyperlipidemia the difference was statistically significant p- value = 0.0001, while in similar study 40% of patients with seizure had dyslipidemia [16]. Ischemic heart disease was present in26.7% of patients with seizure and 49.1% in patients without seizure, the difference was statistically significant-p-value-0.006. Ischemic heart disease was recorded in 100% of patients-aged > 80 years, and lowest was in age group 51-60 years (18.8%), followed by age group, 61-70 years 24.2%, than ≤50 years was.33.3% and 71-80 years was 34.8%, this difference was statistically significant p-value was 0.0001. Ischemic heart disease was recorded in 44.1% of males and 36.8% of females, this difference was not statistically significant p = 0.621. Early onset of seizure was recorded in 11.7% of patients how had ischemic heart disease and 17.9% in patients not suffering ischemic heart disease, late onset was recorded in 83.3% of patients with ischemic heart disease and 82.1% of patients without ischemic heart disease this difference was not statistically significant p value was 0.716 .Hypertension was present in 72.5 % of patients with ischemic heart disease and 27.5% of patients with ischemic heart disease had no hypertension, while 82.5% of patents without ischemic heart disease had hypertension and 17.5% had no hypertension nor ischemic heart disease, this difference was not statistically significant p value = 0.241.

Patients with ischemic heart disease 62.5 % of them had diabetes, and 37.5% were free from diabetes, patients without ischemic heart disease,73.7% of them had diabetes and 26.3% were free from diabetes, this difference was not statistically significant p value = 0.241.

Hyperlipidemia was recorded in 70% of patients with ischemic heart disease, 20% of patients with ischemic heart disease had no hyperlipidemia, 42.1% of patients without ischemic heart disease had hyperlipidemia and 31.6% had no ischemic heart disease nor hyperlipidemia, this difference was statistically significant p-value = 0.020.

Conclusion

The study included 102 patients with stroke, their age ranged between 43years and 98years. Male constituted 60.8%, similar. Seizure was recorded in 44.1%. Onset of seizure was early in 15.6% and late in 84.4%.Almost the seizure was-recorded similarly in all age groups. Seizure was recorded in 43.5% of males and 45% of females. All patients with seizure had history of hypertension. History of diabetes was recorded in77.8% of patients with seizure. Ischemic heart disease was present in 26.7% of patients with seizure. Early onset of seizure was recorded in 11.7% of patients who had ischemic heart disease. Hypertension was present in 72.5 % of patients with ischemic heart disease.

Recommendation

- Increased awareness of post stroke seizures may be important in decrease recurrence of seizures following stroke.
- Further research is needed as cohort study, to Know more information on post-stroke seizures.

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