Cerebrovascular Accident (CVA) Cases in Kirkuk Governorate

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Abstract:

Background: Stroke is one of the important medical disorders encountered in medical practice in emergency departments, wards and as outpatients. This comes from being the 3rd commonest cause of mortality in developed countries and also in our society after ischemic heart disease (IHD) and cancer and the commonest cause of morbidity (those who survive get crippling, deficits and are physically disabled).
Objective: The aim of this study was to assess stroke cases from different parametric aspects and compare it to other published data from nearby areas and internationally.
Patients and Methods: Patients included in this cross-sectional study had been selected by randomly examining patients with stroke admitted to Azadi teaching hospital and kitkuk general hospital in Kirkuk governorate in addition to outpatients seen in the clinic during the period between the 1st of January 2011 to the 31st of December 2012.
Results: This study had enrolled 90 patients (51 (56.7%) male patients and 39 (43.3%) female patients) with stroke. The peak age of occurrence of CVA was in patients > 50 years old. Family history of CVA was positive in 26 patients (28.9%). Distribution of the risk factors was as follows: Hypertension in 55 patients (61.1%) ,diabetes mellitus in 26 patients (28.9%), smoking habit in 32 patients (35.6%), hyperlipidaemia in 39 patients (43.3%), history of previous cardiovascular event in 49 patients (54.4%) in form of previous CVA in 15 patients (30.6%), ischemic heart disease in 27 patients (55.1%) and evidence of peripheral vascular disease in 7 patients (14.3%), particular heart disease in 25 patients (27.8%) in the form of atrial fibrillation (64%), congestive heart failure (16%), mitral valve disease (12%) and aortic valve disease (8%).
Conclusion: This study has presented a profile of stroke patients in Kirkuk. Strokes occurred more frequently in men than in women and the risk increased with age. The major known risk factors were: hypertension (61.1%), previous cardiovascular diseases (54.4%), hyperlipidemia (43.3%), smoking (35.6%) and diabetes (28.9%). In most of the patients, stroke had a sudden onset (54.4%) with hemiplegia and speech defects being the most common presentations (73.3%) and (53.3%); respectively. Ischemic stroke was the commonest finding (43%) in the CT scan followed by the hemorrhagic type (25.8%).
Key words: Stroke – diabetes – hypertension – Kirkuk.

Introduction:

Stroke is defined as an acute loss of focal brain function due to an abnormal perfusion of brain tissue. Most strokes are ischemic (87%) in nature and commonly result from an arterial obstruction by a thrombus or embolus. Hemorrhagic strokes (13%) are caused by rupture or leak of a blood vessel [(1)].

It has been recorded that annually, 15 million people worldwide suffer from stroke. Out of these, 5 million attend optimal recovery, 5 million die, and 5 million suffer from a long lasting disability, placing a huge burden on families and communities [(2)].

Almost one in four men and nearly one in five women aged 45 years can expect to have a stroke if they live to their 85th year [(3)].

The overall incidence rate of stroke is around 2-2.5 per thousand populations. The risk of recurrence over 5 years is 15-40%. It is estimated that by 2023 there will be an absolute increase in the number of patients experiencing a stroke of about 30%. Impact of stroke on health service provision includes 4-6% of the health service budget, 55-90% admission rates to hospital 20% acute beds, 25% long-term beds used for stroke [3]. Over 65% of stroke deaths are reported from developing countries [4].

The Middle East region faces a double burden of disease due to decreasing rates of communicable diseases and increasing rates of non-communicable disease [5].

Several terms have been used to classify strokes, often based on the duration and evolution of symptoms:

1. Transient ischaemic attack (TIA): episodes of stroke symptoms that last only briefly; the standard definition of duration is <24 h, but most TIAs last <1 h [6].
2. Stroke: This is the term reserved for those events in which symptoms last more than 24 hours [7].
3. Progressing stroke (or stroke in evolution): This describes a stroke in which the focal neurological deficit worsens after the patient first presents. Such worsening may be due to increasing volume of infarction, haemorrhagic transformation or increasing oedema [7].
4. Completed stroke: This describes a stroke in which the focal deficit persists and is not progressing [7].

Because stroke is the leading cause of morbidity and the third leading cause of mortality, optimal reduction of risk factors is paramount in preventing and managing stroke [1,7].Non modifiable risk factors include: age, gender (male > female, except in the very young and very old), heredity and previous cardiovascular event, e.g. myocardial infarction, stroke or peripheral embolism .

Modifiable risk factors include: high blood pressure, heart disease (atrial fibrillation, heart failure, endocarditis), diabetes mellitus, hyperlipidaemia, smoking, polycythaemia and oral contraceptives. [7]

An acute stroke is signified by a sudden onset of focal neurologic deficit and is variable depending on the area of tissue ischemia [1]. The patients and their family members should be counselled to call emergency medical services immediately if they experience or witness the sudden onset of any of the following: loss of sensory and/or motor function on one side of the body, change in vision, gait, or ability to speak or understand; or if they experience a sudden, severe headache[6].

Determining the immediate cause of a stroke may be difficult. Onset during sleep or on arising suggests infarction; onset during exertion suggests hemorrhage. A large embolus tends to cause an acute completed stroke, with sudden onset and focal disorders that are maximal within minutes; headache may precede the stroke. Thrombosis is suggested by a slower onset or gradually progressing symptoms (as in evolving stroke) [8]. The chance of being other than stroke with above presentation is no more than 5 %[7].

Computed tomography (CT) of the brain has been the mainstay of imaging patients with an acute neurological deficit because of its wide availability. Magnetic resonance imaging (MRI)

may be used to verify infarction if the diagnosis remains in doubt [9, 10].

The aim of this study was to assess stroke cases from different parametric aspects and compare it to other published data from nearby areas and internationally.

Patients and Methods:

This cross-sectional study enrolled (90) patients with stroke admitted to Azadi teaching hospital and Kirkuk general hospital as outpatients seen in the clinic during the period between the 1st of January 2011 to the 31st of December 2012.

All patients were labelled as having stroke according to the features of their disorder. The data were collected by a special questionnaire prepared by the researcher and subjected to the patients or their relatives.

Distribution of the patients according to the demographic features, presentation of the disease, presence of specific risk factors (such as smoking, diabetes, hypertension, hyperlipidaemia) and imaging findings were all included in the questionnaire. Verbal consent was obtained directly from conscious patients or from their close relatives if the patients were unable to talk.

Results:

There were 51 (56.7%) male patients and 39 (43.3%) female patients. Male to female ratio was (1.3:1). Mean age was (57) years. The peak age of occurrence of CVA was in patients > 50 years old. Family history of CVA was positive in 26 patients (28.9%). 75 patients (83.3%) were right handed and 15 patients (16.7%) were left handed.

Diabetes mellitus was present in 26 patients (28.9%), of whom 7 patients (27%) were on dietary control, 14 patients (53.8%) were on oral anti diabetic agents and 5 patients (19.2%) were on insulin therapy.

Smoking habit was present in 32 patients (35.6%) with (50%) of those patients being smokers for more than 10 years and (50%) used to smoke more than 1 pack (20 cigarettes) per day. Distribution of the patients according to age, sex, smoking habit and diabetes status is shown in (Table-1).

Hypertension was present in 55 patients (61.1%), of whom 32 patients (58.2%) were on treatment while the remainder 23 patients (41.8%) weren't on treatment.

A positive history of previous cardiovascular event was present in 49 patients (54.4%) in form of previous CVA in 15 patients (30.6%), ischemic heart disease in 27 patients (55.1%) and evidence of peripheral vascular disease in 7 patients (14.3%). Some patients had both ischemic heart disease and peripheral vascular disease. Distribution of the patients according to the evidence of previous cardiovascular events and hypertension is shown in (Table-2).

Evidence of particular heart disease was present in 25 patients (27.8%) in the form of atrial fibrillation in 16 patients (64%), congestive heart failure in 4 patients (16%), mitral valve disease in 3 patients (12%) and aortic valve disease in 2 patients (8%). Distribution of the patients according to the presence of particular heart disease and family history is shown in (Table-3).

Hyperlipidaemia was present in 39 patients (43.3%) with 23 patients (59%) having elevated serum cholesterol and 16 patients (41%) having elevated triglycerides.

Polycythaemia was confirmed by investigations in 21 patients (23.3%). Use of oral contraceptive pills was

reported in (7.5%) of the females in this study.

Evidence of vasculitis was present in 19 patients (21.1%) in the form of rash in 5 patients (26.3%) and elevated erythrocyte sedimentation rate (ESR) >50 mm/hr in the remaining 14 patients (73.7%). Distribution of the patients according to the presence of hyperlipidemia, polycythemia and evidence of vasculitis is shown in (Table-4).

Percentage distribution of the risk factors for stroke is shown in (Figure-1) noting that some patients had got more than one risk factor at the same time.

Regarding the pattern of onset of the deficit, 49 patients (54.4%) reported a sudden onset, 34 patients (37.8%) over hours and 7 patients (7.8%) over days (Figure-2). The time of onset was early in the morning in 25 patients (27.8%), during the daytime in 49 patients (54.4%) and during sleep in 16 patients (17.8%) (Figure 3).

With the onset of the deficit, 43 patients (47.8%) remained conscious, 38 patients (42.2%) had disturbed consciousness and 9 patients (10%) became comatose (Figure-4).

The neurological deficits were in form of hemiplegia in 66 patients (73.3%), speech defect in 48 patients (53.3%), cranial nerve palsy in 27 patients (30%), hemisensory loss in 6 patients (6.6%) and tetraplegia in 5 patients (5.5%) (Figure 5). Some patients had more than one pattern of neurological deficits.

CT scan was done for 85 patients. For the remaining five, CT scan was not performed either because the patients were too ill to be moved or the CT machine was out of order. CT scan was performed early (within 24 hrs) for 45 patients (53%) and within (24-48) hrs for the remainder 40 patients (47%) (Figure-6).

The findings of CT scan were as follows: infarction (43%), haemorrhage (25.8%), brain shift (10.8%) and (20.4%) of the CT scans were normal (Figure-7). Brain shift from midline is either due to intracranial hemorrhage or a massive brain infarction.

Table (1): Frequency distribution of the study sample by age, sex, smoking habit and diabetes status

Age (year)	Male						Females					
	Frequency	Smoking habit	Diabetic				Frequency	Smoking habit	Diabetic			
			No.*	On diet	Oral anti-diabetic drugs	Insulin			No.*	On diet	Oral anti-diabetic drugs	Insulin
30 – 40	5	3	1	1	-	-	5	-	-	-	-	-
41 – 50	8	4	3	-	1	2	7	1	3	1	2	-
>50	38	22	9	4	4	1	27	2	10	1	7	2
Total	51	29	13	5	5	3	39	3	13	2	9	2

Table (2): Frequency distribution of the study sample by age, sex, previous cardiovascular events and hypertension.

Age (year)	Male (No.)*					Female (No.)*				
	Previous cardiovascular events			Hypertension		CVA**	CAD***	PAD****	Hypertension	
	CVA**	CAD***	PAD****	On R/*****	Not on R/				On R/*****	Not on R/
30 – 40	-	-	4	1	-	-	-	-	-	-
41 – 50	-	3	1	2	2	3	2	-	2	-
>50	6	10	2	13	15	6	12	-	14	6
Total	6	13	7	16	17	9	14	-	16	6

* No.: number
**CVA: cerebrovascular accident
***CAD: coronary artery disease
****PAD: peripheral artery disease
*****R/: treatment

Table (3): Frequency distribution of the study sample by age, sex, presence of specific heart disease and family history.

Age (year)	Male (No.)*				Female (No.)*			
	Valve lesion	AF**	CHF***	Family history	Valve lesion	AF**	CHF***	Family history
30 – 40	-	2	-	2	1	1	-	1
41 – 50	1	1	1	2	1	-	-	2
>50	2	8	-	9	-	4	3	10
Total	3	11	1	13	2	5	3	13

*No.: number
**AF: atrial fibrillation
***CHF: congestive heart failure

Table (4): Frequency distribution of the study sample by age, sex, hyperlipidemia, polycythemia and evidence of vasculitis.

Age (year)	Sex	Hyperlipidemia (***No.)		Polycythemia (***No.)	Evidence of vasculitis (***No.)	
		High cholesterol	High triglycerides		Rash	High ESR****
30 – 40	M.*	-	-	2	2	-
	F.**	-	-	-	-	-
41 – 50	M.*	2	4	1	-	5
	F.**	1	1	2	-	1
>50	M.*	11	6	12	2	5
	F.**	9	5	4	1	3
Total		23	16	21	5	14

*M.: Male
**F.: Female
****ESR: Erythrocyte Sedimentation Rate
***No.: Number

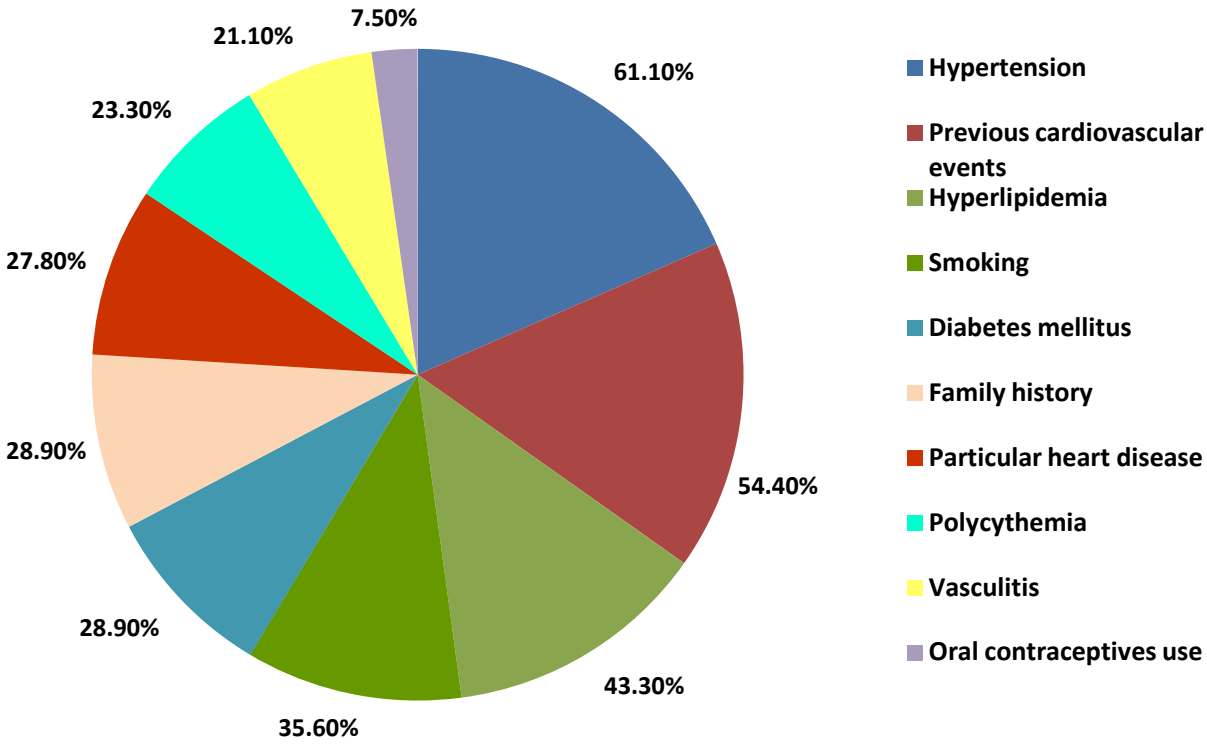

Figure (1): Percentage distribution of the risk factors of stroke. (N.B.: some patients had got more than one risk factor at the same time).

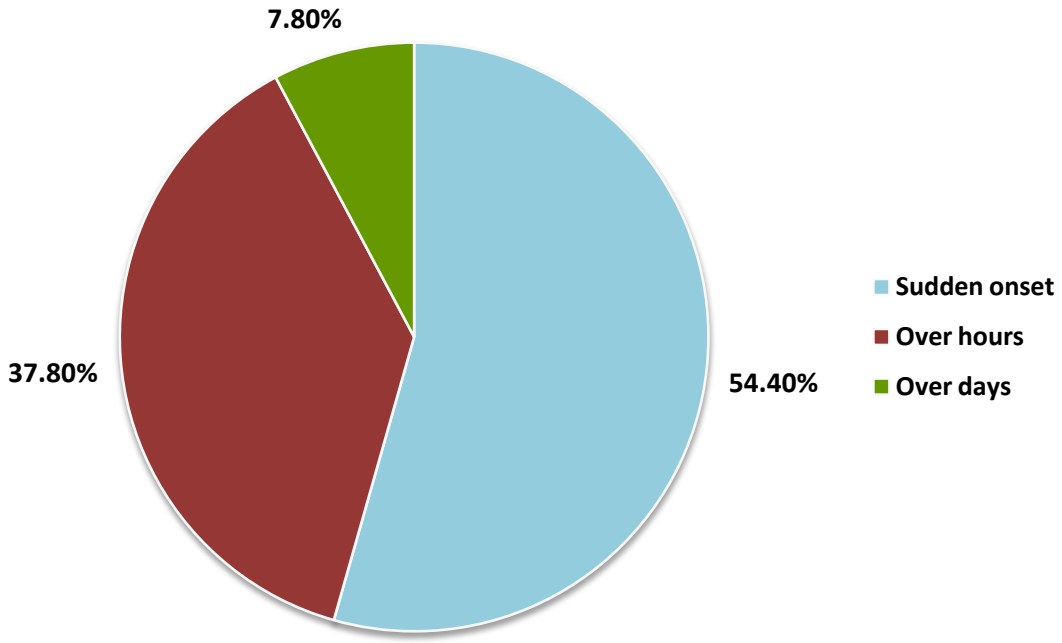

Figure (2): Percentage distribution of patients with stroke according to the pattern of onset of the deficit.

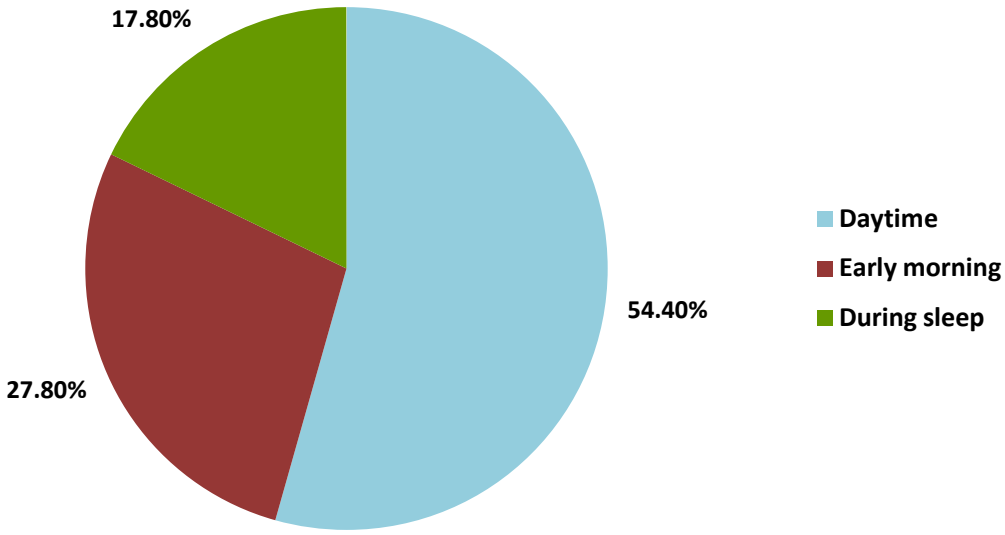

Figure (3): Percentage distribution of patients with stroke according to the time of onset of the deficit.

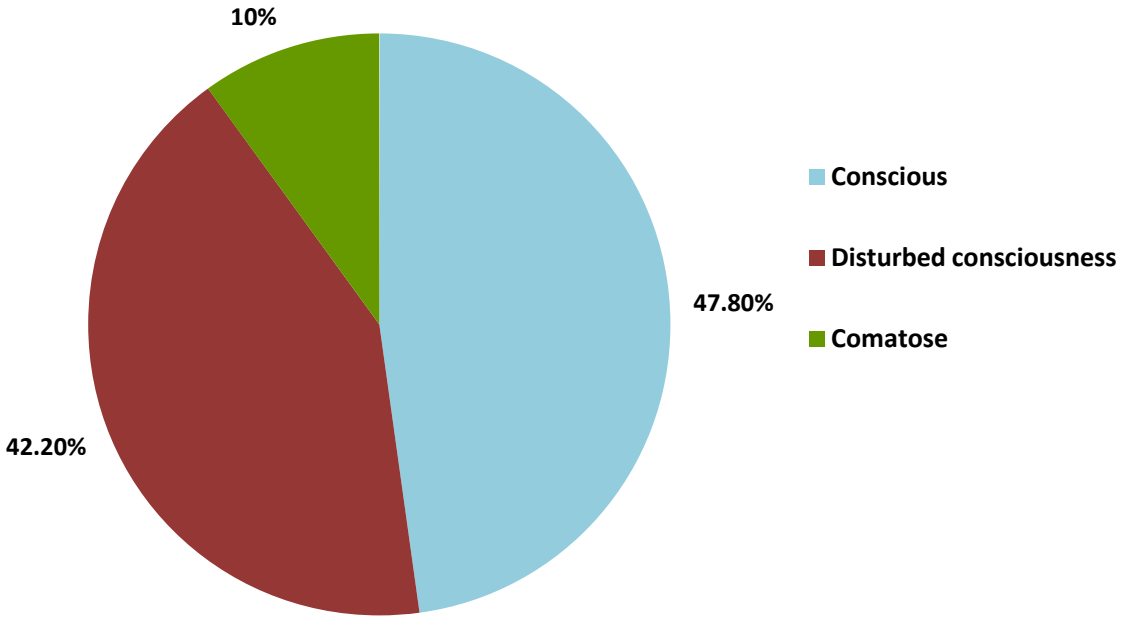

Figure (4): Percentage distribution of patients with stroke according to the level of consciousness.

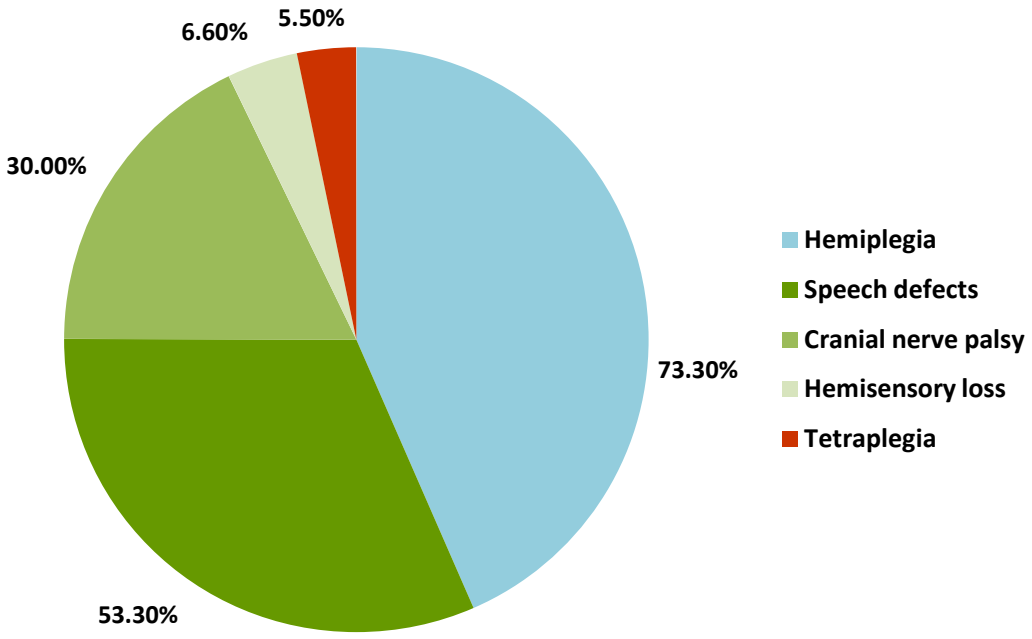

Figure (5): Percentage distribution of patients with stroke according to the type of neurological deficit. (N.B. : some patients had more than one neurological deficit).

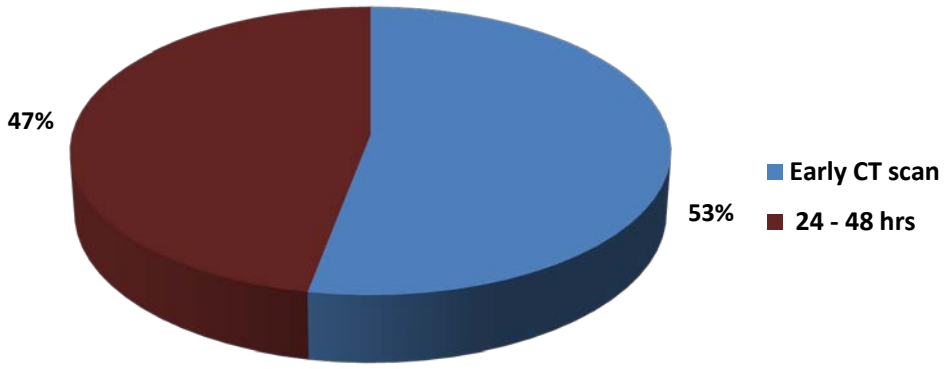

Figure (6): Percentage distribution of patients with stroke according to the time of CT performance.

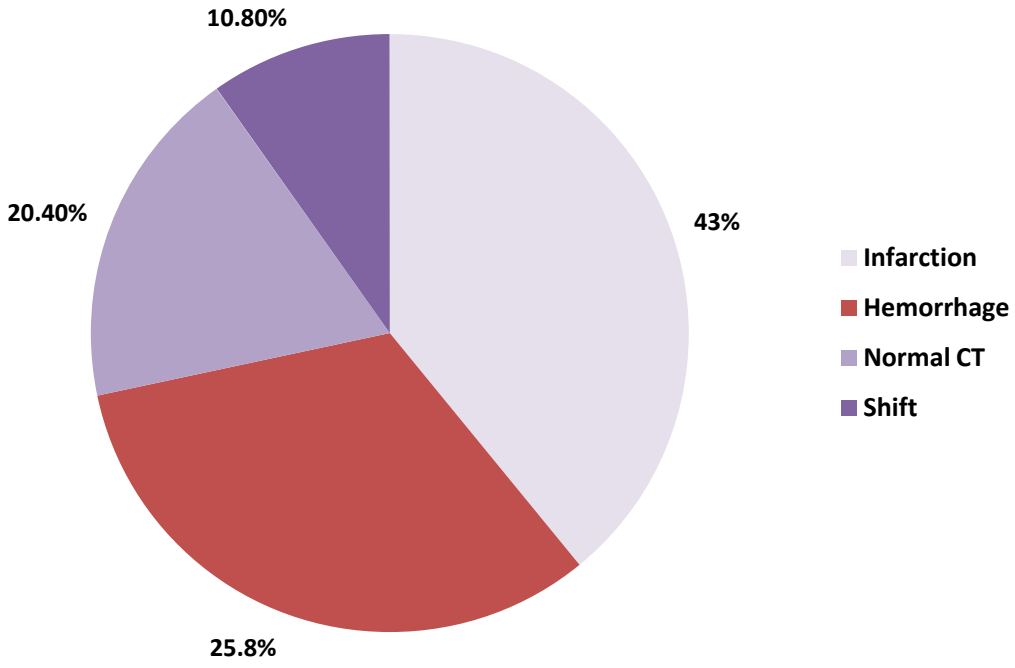

Figure (7): Percentage distribution of patients with stroke according to the findings of CT scan.

Discussion:

Stroke is the most common preventable neurological disease. The low frequency of treatment options in comparison to the grave high disease burden on the families and public health makes most of the efforts to be directed toward recognition of risk factors in order to prevent and to reduce the disease occurrence to minimal incidence rates [11].

This study shows that there's an increase in stroke occurrence with increasing age which is comparable to two studies done in Baghdad by Zaki et al.[11] and Suleiman et al. [12] .A study done in Erbil by Al-Shimmery et al.[13] showed a significant association between old age and presence of silent infarcts. These results reflect the similarity in cultural characters.

The present study is compatible with a study done in U.S.A by Lewis H. Kuller and another in U.K by Jackie et al. in that stroke rates appear to be higher in men in the younger age groups, but in older age groups, the incidence is about the same in men and women [14, 5]. Atherosclerosis is important cause of CVA and it has equal prevalence regardless of sex at older age group.

Hypertension was present in (61.1%) of patients with stoke and this is approximately similar to the study done in Tikrit by Omar S. Sallman in which (58%) of stroke patients had hypertension [15]. Hypertension was also the main risk factor in the recurrence of stroke in a study done in Turkey by Sema et al. [16]. Most of these findings are related to the similarity of the cultural factors between Kirkuk and these areas.

History of previous cardiovascular disease was present in (54.4%) of patients, a result which in compatible with the study done by Omar S. Sallman in Tikrit [15].

Hyperlipidemia was present in (43.3%) of the patients which is in agreement with the study done in Iran by Mansoureh et al. [17].

In this study, (35.6 %) of the patients were smokers, a percentage which is lower than that in the study done by Omar S. Sallman in Tikrit (61.5%) [15].

Family history of stroke was present in (28.9%) of the cases which is higher than the value obtained from the study of Al-Rajeh et al. (14%) [18].

Diabetes was present in (28.9%) of the patients while in the study of Kumar et al. DM was present in (33.6%) of the patients with stroke [19]. This is probably due to the fact that we depended upon documented DM rather than hyperglycemia.

Elderly patients with atrial fibrillation are at higher risk of a new ischemic stroke as shown in the study of Ana et al. [20] .In this study,(17.8%) of the stroke patients were found to have atrial fibrillation.

Most patients with stroke (54.4%) reported a sudden onset of symptoms while symptoms presented mostly over hours in a study done by Fahmi et al. in Qatar [21]. Weakness and speech defects were the most common manifestations in the study of Kumar et al. which is compatible with the current study [19].

Infarction was the most common finding on CT scan followed by hemorrhage in a study done in Jordan by Al-Oraibi which in compatible with this study [22].

Conclusion:

Strokes occurred more frequently in men than in women and the risk increased with age. The major known risk factors were: hypertension (61.1%), previous cardiovascular diseases (54.4%), hyperlipidemia (43.3%), smoking (35.6%) and diabetes (28.9%). In most of the patients, stroke had a sudden onset (54.4%) in the daytime (54.4%) with hemiplegia and speech defects being the most common presentations (73.3%) and (53.3%), respectively. CT scan was performed for most of the patients and the ischemic stroke was the commonest finding (43%) followed by the hemorrhagic type (25.8%).

Recommendations:

1. There is need for a wide national health program to educate about the risk factors of stroke and its primary and secondary prevention.
2. There is need for advanced centers specialized in the treatment and researches of stroke (Stroke Units) to improve our understanding of the real dimensions of the problem in our country and to ease its control.
3. Improving the primary health centers to increase the detection of risk factors; as this will lead to reduction of the stroke as well as ischemic heart diseases and definitely this will reduce so much the heavy burdens of these diseases.

Acknowledgement:

In debt we feel much thankful to Professor Muhammad Mustafa in community medicine department/ Kirkuk medical college for his patience in doing the statistical part of the work.
Thanks to doctors and nursing staffs in the ward for their enormous help.
Hope for patients' wellbeing as their data were used.

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