Original Research Article

Epidemiological Profile of Stroke patients at Neuropsychiatry Department, Tanta University Hospitals

Abstract

Background: Stroke is the second most common cause of death and long-term disability worldwide with up to one of every six survivors remaining permanently disabled. It is a devastating and disabling cerebrovascular disease with significant amount of residual deficit leading to economic loss and disease burden worldwide.

Aim: Describe the epidemiological profile of stroke during the period of five years (2014-2018).

Study design: cross- sectional study.

Place and Duration of Study: This study was carried out in the Neuro-psychiatry hospital (free and economic departments) at Tanta University Hospital. This study started from the first of April 2019 and completed by July2021.

Methodology: The sample we included 3435patient medical records. Tools of the study were: file extracted sheets of the five years (2014-2018).It was about data related to epidemiological profile of stroke.

Results: This study included 3435patient medical records admitted with stroke at the years2014-2018 and had the following epidemiological profile: the age ranged from 30-95 years and the median age was 65 years old .Male constituted 51.8% of patients, about two thirds, (64.9%) of patients were from urban residence and 66.8%were married. As regards type of stroke: ischemic stroke presented by 63.5%of patients and hemorrhagic stroke by 36.5%.Of all patients 30% had favorable outcome, 67.4% had stable condition and 2.7% were died.

Conclusion: The rate of stroke was increasing through the studied five years with most cases at year 2018 and the epidemiological profile was not different from other studies.

Keywords: Epidemiology, Stroke, Neuropsychiatry, Hospital.

Introduction

Stroke is defined by WHO as a rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death with exclusion of any apparent causes other than vascular origin.[1,2].

Stroke is classified into two types; a hemorrhagic stroke (cerebral hemorrhage) in which an artery may rupture resulting in bleeding into the brain, while an ischemic stroke results from atherosclerosis where an artery may become blocked by progressive thickening of walls or due to embolism as a clot blocks an artery and prevents blood getting to part of the brain[3, 4].

Stroke is the second leading cause of death and disability worldwide with up to one of every six survivors remaining permanently disabled. It is a devastating and disabling cerebro vascular disease with significant amount of residual deficit leading to economic loss and disease burden worldwide [5].
The aim and rationale of this study to describe the epidemiological profile of stroke during the period of study for effective prevention and control.

Subjects and methods

Ethical consideration: Communication to authorities was done and approval to conduct the study was obtained from Ethical Committee for Research at Tanta Faculty of Medicine with postal code (33142/05/19) and the Neuropsychiatry hospital. Data was not used for any purpose other than the scientific research.

Study design and setting: The study was cross sectional and carried-out at Neuropsychiatry hospital (free and economic departments) of Tanta university hospitals, Egypt. This study started from the first of April 2019 and completed by July2021. This hospital is a teaching and referral hospital providing health services to the population of Tanta and neighboring rural and urban areas. Tanta University Hospitals are considered as the largest health institutions in Gharbia Governorate. The neuropsychiatry department started in1968 as a part of internal medicine department, and then it became a separate department at 1994. New center was joined to it in 2007. The new center was a good addition to the department as it includes economic department for patient with medical insurance and it is the only department in Gharbia Governorate and delta region that provide high quality investigations and treatment for neurological and psychiatric diseases. The department receives around 3000 patients/year. The majority of patients are diagnosed and treated at the department. Other cases are referred from other health institutions to get the specific care provided by the department. It provide investigations and treatment of neurological diseases e.g.: stroke management, intensive care unit, EEG, nerve and muscle unit, Botox injection, physiotherapy &rehabilitation unit, brain catheter, sleep disorders unit, ultra sound and duplex for brain arteries , addiction treatment unit.

Study population: All medical records of stroke patients at the five years of study (2014-2018) at neuropsychiatry department (free and economic departments) of Tanta university hospitals, Egypt. Any medical record with other neurological disease rather than stroke and incomplete records were excluded.

Tools of the study: A file extracted sheet was used for data extraction from medical records of patients admitted to Neuropsychiatry department to portray epidemiological profile of stroke during the five years of the study (2014-2018): it included: age, sex, occupation, residence, diagnosis, time of admission, date of leaving hospital , and outcome.

Data collection: Data extraction started at June 2019 until the end of February 2020 from medical records.

Statistical analysis was performed using SPSS 20.Numerical data was presented as median and categorical ones as number and percentage.

Results:

The total number of patient medical records in the study was 3435. It was noted that (table1) there is increase of percentage of stroke during the period of the study with most frequent 31.8% was in year 2018 and the least 20.5% was in year 2014. Among the studied patients during the years 2014-2018 (table 2),all years were nearly the same with 71.2% were at the age group 61-70 years, males were slightly more than females (51.8% Vs. 48.2%), about two thirds 64.9% were from urban residence. Married patients constituting 66.8% of patients and more than half 52.6% of them were nonprofessional. Among the studied patients during the five years(table 3) ;77.7% stayed in hospital more than one week, about two thirds 73.2% were discharged in stable condition followed by 23.5% discharged as improvement in their condition then dead by 3.3% . Patients diagnosed with ischemic stroke (table 4) were higher than those diagnosed with hemorrhagic stroke in all years and constituting (63.5% vs. 36.5%) respectively. Among the studied ischemic patients (table 5) during the years 2014-2018; 83.0% were at the age group 56-65 years, females were slightly more than males (55% vs. 45%), more than half 51.9% were from rural residence. Married patients were constituting 65.5% of patients and about two thirds 63.3% of them were nonprofessional. among the studied hemorrhagic patients(table 6) during the years 2014-2018; 40.8% were at the age group 76-95years, males were more than females about two thirds (63.7% vs. 36.3%), about two thirds87.7% were from urban residence. Married patients constituting 68.9% of patients and about two thirds 65.9% were professional. Among the studied ischemic patients(table7) during the years2014-2018; 96.7% stayed in hospital more than one week, about two thirds67.4% were discharged in stable condition followed by 29.9% discharged as improvement in their condition then dead by 2.7% .Among the studied hemorrhagic patients (table 8)during the years 2014-2018; 55.6% stayed in hospital for one week, the majority 83.2% were discharged in stable condition followed by 12.3% discharged as improvement in their condition then dead by 4.5%.

Discussion:

When a disease occurs in a population, epidemiology help us to understand where the disease is coming from, and who it is most likely to impact. The information gathered can then be used to control the spread of the disease and prevent future outbreaks.

Regarding the epidemiological profile, there was increase in incidence during the study period (table 1), stroke incidence increase every year because of more awareness of patients and their relatives ,knowing the warning signs ,more affection with chronic diseases as hypertension ,diabetes mellitus and cardiac diseases. More advance in investigations and treatment. This is in agreement with results of ***El-Hajj et al., 2016*** who found that the epidemiology of stroke was changing rapidly all over the globe. Over the 1990–2013 periods, there was a significant increase in stroke incident events, survivors and deaths for both ischemic and hemorrhagic stroke with a substantial increase in the absolute number of disability-adjusted life years (DALYs) due to ischemic stroke [(18)].

As regard to diagnosis of stroke in (table 4), more than half were ischemic stroke while about one third were hemorrhagic stroke .In agreement with our study ***Khedr et al.,2014*** who found that The crude prevalence rate of ischemic stroke was significantly higher than that of hemorrhagic stroke (797 vs. 125 of 100,000) [(6)]. Also CDC reported that about 87% of all strokes are ischemic strokes, in which blood flow to the brain is blocked [(7)].

As regard to sociodemographic characteristics of all stroke patients over the last five years (tables2, 5, and 6), the age of studied patients ranged from 30-95 years old the majority were at age group 61-70 years old. Patients with ischemic stroke were younger than those of the hemorrhagic one where the majorities of ischemic were at the age group56-65 year corresponding to those of hemorrhagic one. The highest percentage of hemorrhagic patients were at age group 76-95 years and this was in line with the finding of ***Gebreegziabher et al., 2021*** who reported that the high prevalence of hemorrhagic stroke among patients above 50 years old is mainly related to a steadily progressing generalized vascular disease most often of arteriosclerotic type .Also hypertensive vasculopathy which gives rise to extensive hyaline degeneration and some aneurysmal changes [(8)].

As regard to sex of all stroke patients, females were more than the half. This observation was in similar opinion with the findings of ***Watila et al., 2011*** who found that lower than half 48% of stroke patients were males compared to more than half 52% of female stroke patients. The high percentage of ischemic stroke among females may be related partially to previous intake of contraceptive pills for longer period of time especially of an irregular manner [(9)].

Also, this may be attributed to an increased incidence of cerebrovascular events during the pregnancy and post-partum period. Arterial occlusion occurring in the second and third trimesters and the

first week after delivery is mostly related to the focal vascular lesions during pregnancy and early peurperium. A unique postpartum illness consisting of headache and fluctuating transient ischemic attacks associated with diffuse vasospasm of cerebral cortical vessels is also described [10].

Another point of view , males as an earning power of the community refuse in patient admission and prefer treatment in outpatient clinics especially males not covered by health insurance and those with mild attacks[11] .On the other hand ,***Wilson et al ., 2015*** who found that more than half 61.7% of ischemic patients were males and about one third 38.3% were females . Different strategies of financial coverage of population in different countries with specific behavioral characters may explain the difference in sex between our results and their results [12].

Among hemorrhagic patients more than half were males while slightly more one third were females. This predominance of male patients than female ones could be attributed to the more prevalence of hypertension among the male geriatric patients than females. This result agreed with the findings of ***Everett et al., 2015***[13].

As regard to residence of all stroke patients, more than half were living in urban areas while about one third were living in rural areas. This may be explained by increased stress of living in urban environment and sedentary life style due to improvement in living conditions with better home heating in colder seasons.

On the other hand ***Hesami et al., 2015*** found that about third of quarter of hemorrhagic patients were rural while lower than third were urban. This may be explained by reluctance and non-compliance of patients in rural areas in treating common risk factors especially hypertension, diabetes mellitus, cardiac disorders and obesity. Some authors suggest that the frequency of intracranial hemorrhage is not higher in temperate regions than in tropical or subtropical regions [14].

As regard to marital status of all stroke patients, more than half were married while lower than half were un married (single, divorced, widow) because married patients were surrounded by their beloved persons, relatives and off springs who help getting them early to the hospital.

As regard to duration of stay and outcome in (table 3, 7, 8), in this study the median of length of hospital stay among ischemic stroke patients was 8 days, while it was 6 days for hemorrhagic one. In agreement with our results, ***Rincon et al 2010*** who found that the mean length of hospital stay among patients with non-hemorrhagic stroke was 8.2± 0.4 days [15].

On the other hand, ***Fonarowet al., 2010*** found that the mean length of hospital stay for hemorrhagic patients was 11±11 days while it was 12 ±10 days among ischemic ones [16]. ***Liuet al., 2020*** found that patients admitted had a median stay of seven days if they died, 19 days if they returned home and 149 days if they needed alternative long term accommodation. In a study conducted in Amsterdam,

Netherlands, 2019, Van Straten A. and his colleges found that , the mean length of hospital stay for stroke patients was 28 days [17].

As regard to outcome of all stroke patients in this study about third of quarter were in stable condition ,lower than third were improved and least were dead , the highest mortality rates was encountered among hemorrhagic patients . On the other hand one third of ischemic stroke patients were discharged as favorable improved condition as they can walk with or without aid.

Conclusion:

Frequency of stroke is increasing and it is the most frequent among the neurological disorders. The most common non modifiable risk factors contributing to stroke were old age >70 years old, female sex, rural residence, none educated and married.

Recommendations:

Establishment of a health education program in mass media and health centers aiming at improving knowledge, attitude and practice of individuals towards stroke. This programme is concerned with: The nature and mechanism of occurrence of stroke and the most probable risk factors predisposing to stroke.

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Table (1): Distribution of stroke patients admitted to the Neuropsychiatry Department during the period of 2014-2018

Year	Total admitted patients	Number of patients diagnosed with stroke	Percent of patients diagnosed with stroke
2014	3302	677	20.5
2015	2700	679	25.2
2016	2500	685	27.4
2017	2300	694	30.2
2018	2200	700	31.8

Table (2): Sociodemographic characteristics of stroke patients admitted to Neuropsychiatry Department during the period of 2014-2018

Variable	Year of study											
	2014 (n=677)		2015 (n=679)		2016 (n=685)		2017 (n=694)		2018 (n=700)		Total (n=3435)	
	n	%	N	%	N	%	n	%	N	%	n	%
Age in years: <50	2	0.3	2	0.3	2	0.3	21	3.0	14	2.0	41	1.2
50-60	23	3.4	21	3.1	23	3.4	46	6.6	44	6.3	157	4.6
61-70	539	79.6	543	80.0	547	79.8	401	57.8	416	59.4	2446	71.2
71-95	113	16.7	113	16.6	113	16.5	226	32.6	226	32.3	791	23.0
Range Median	45-90 65		40-95 65		45-95 65		30-95 65		45-95 65		45-95 65	
Sex: Male	339	50.1	340	50.1	346	50.5	378	54.5	378	54.0	1780	51.8
Female	338	49.9	339	49.9	339	49.5	316	45.5	322	46.0	1655	48.2
Residence: Urban	457	67.5	461	67.9	465	67.9	419	60.4	429	61.3	2231	64.9
Rural	220	32.5	218	32.1	220	32.1	275	39.6	271	38.7	1204	35.1
Marital status: Married	467	69.0	469	69.1	489	71.4	418	60.3	450	64.3	2293	66.8
Un married*	210	31.0	210	30.9	196	28.6	276	39.8	250	35.7	1142	33.2
Occupation: Professional	317	46.8	315	46.4	317	46.3	341	49.1	337	48.1	1627	47.4
Non professional	360	53.2	364	53.6	368	53.7	353	50.9	363	51.9	1808	52.6

19. *Unmarried (single, divorced and widow)

Table (3): Duration of hospital stay and outcome of stroke patients admitted to Neuropsychiatry Department during the period of 2014-2018

Variable	Year of study											
	2014 (n=677)		2015 (n=679)		2016 (n=685)		2017 (n=694)		2018 (n=700)		Total (n=3435)	
	n	%	N	%	N	%	N	%	n	%	N	%
Duration of stay/days: **<7**	110	16.2	112	16.5	116	16.9	215	31.0	215	30.7	768	22.3
≥7	567	83.8	567	83.5	569	83.1	479	69	485	69.3	2667	77.7
Range Median	1-30 8		1-30 8		1-30 8		1-30 8		1-30 8		1-30 8	
Outcome: Favorable (Improved)	158	23.3	155	22.8	161	23.5	167	24.1	167	23.9	808	23.5
Un favorable (Stable condition)	489	72.2	492	72.5	492	71.8	517	74.5	523	74.7	2513	73.2
Death	30	4.4	32	4.7	32	4.7	10	1.4	10	1.4	114	3.3

Table (4): Distribution of stroke types during the study period of 2014-2018

Type of stroke	Year of study											
	2014 (n=677)		2015 (n=679)		2016 (n=685)		2017 (n=694)		2018 (n=700)		Total (n=3435)	
	N	%	n	%	n	%	n	%	n	%	N	%
Ischemic stroke	470	69.4	465	68.5	470	68.5	389	56.1	388	55.4	2182	63.5
Hemorrhagic stroke	207	30.6	214	31.5	215	31.5	305	43.9	312	44.6	1253	36.5

Table (5): Sociodemographic characteristics of ischemic stroke patients admitted to Neuropsychiatry Department during the period of 2014-2018

Variable	Year of study											
	2014 (n=470)		2015 (n=465)		2016 (n=470)		2017 (n=389)		2018 (n=388)		Total (n=2182)	
	N	%	n	%	N	%	n	%	n	%	n	%
Age in years: ≤55 years	9	1.9	8	1.7	9	1.9	18	4.6	21	5.4	65	3.0
56- 65	417	88.8	414	89.0	417	88.8	283	72.7	279	71.9	1810	83.0
66- 75	19	4.0	18	3.9	19	4.0	38	9.8	38	9.8	132	6.0
76-95	25	5.3	25	5.4	25	5.3	50	12.9	50	12.9	175	8.0
Range Median	45-90 65		40-95 65		45-90 65		45-90 65		40-95 65		40-90 65	
Sex: Male	197	41.9	192	41.3	197	41.9	191	49.1	190	49.0	982	45.0
Female	273	58.1	273	58.7	273	58.1	198	50.9	198	51.0	1200	55.0
Residence: Rural	272	57.9	269	57.8	272	57.9	158	40.6	161	41.5	1132	51.9
Urban	198	42.2	196	42.2	198	42.2	231	59.4	227	58.5	1050	48.1
Marital status: Married	323	68.7	318	68.4	330	70.2	210	53.9	249	64.2	1430	65.5
Un married*	147	31.3	147	31.6	140	29.9	179	46.0	139	35.8	752	34.5
Occupation: Professional	199	42.3	197	42.4	199	42.3	105	27.0	101	26.0	801	36.7
Non professional	271	57.7	268	57.6	271	57.7	284	73.0	287	74.0	1381	63.3

*Un married (single, divorced and widow)

Table (6): Sociodemographic characteristics of hemorrhagic stroke patients admitted to Neuropsychiatry Department during the period of 2014-2018

Variable	Year of study											
	2014 (n=207)		2015 (n=214)		2016 (n=215)		2017 (n=305)		2018 (n=312)		Total (n=1253)	
	N	%	n	%	N	%	n	%	N	%	n	%
Age in years: ≤55	3	1.4	3	1.4	3	1.4	23	7.5	13	4.2	45	3.6
56-65	96	46.4	103	48.1	104	48.4	66	21.6	83	26.6	452	36.1
66-75	35	16.9	35	16.4	35	16.3	70	23.0	70	22.4	245	19.6
76-95	73	35.3	73	34.1	73	33.9	146	47.9	146	46.8	511	40.8
Range Median	45-95 70		45-95 68		45-95 66		30-95 75		40-95 72.50		30-95 70	
Sex: Male	141	68.1	148	69.2	149	69.3	180	59.0	180	57.7	798	63.7
Female	66	31.9	66	30.8	66	30.7	125	41.0	132	42.3	455	36.3
Residence: Urban	185	89.4	192	89.7	193	89.8	261	85.6	268	85.9	1099	87.7
Rural	22	10.6	22	10.3	22	10.2	44	14.4	44	14.1	154	12.3
Marital status: Married	144	69.6	151	70.6	159	74.0	208	68.2	201	64.4	863	68.9
Un married*	63	30.3	63	29.4	56	26	97	31.8	111	35.6	390	31.1
Occupation: Professional	118	57.0	118	55.1	118	54.9	236	77.4	236	75.6	826	65.9
Non professional	89	43.0	96	44.9	97	45.1	69	22.6	76	24.4	427	34.1

*Un married (single, divorced and widow)

Table (7): Duration of hospital stay and outcome of ischemic stroke patients admitted to Neuropsychiatry Department during the period of 2014-2018

Variable	Year of study											
	2014 (n=470)		2015 (n=465)		2016 (n=470)		2017 (n=389)		2018 (n=388)		Total (n=2182)	
	n	%	n	%	N	%	n	%	N	%	n	%
Duration of stay/day: < 7	12	2.6	9	1.9	12	2.6	19	4.9	19	4.9	71	3.3
≥ 7	458	97.4	456	98.1	458	97.4	370	95.1	369	95.1	2111	96.7
Range Median	2-30 8		2-30 8		2-30 8		2-30 8		2-30 8		2-30 8	
Outcome: Favorable (Improved)	123	26.2	118	25.4	123	26.2	145	37.3	145	37.4	654	29.9
Unfavorable (Stable condition)	333	70.8	333	71.6	333	70.8	236	60.7	235	60.6	1470	67.4
Death	14	3.0	14	3.0	14	3.0	8	3.0	8	2.1	58	2.7

Table (8): Duration of stay and outcome of hemorrhagic stroke patients admitted to Neuropsychiatry Department during the period of 2014-2018

Variable	Year of study											
	2014 (n=207)		2015 (n=214)		2016 (n=215)		2017 (n=305)		2018 (n=312)		Total (n=1253)	
	N	%	N	%	N	%	n	%	n	%	n	%
Duration of stay/day: <7	98	47.3	103	48.1	104	48.4	196	64.3	196	62.8	697	55.6
≥7	109	52.7	111	51.9	111	51.6	109	35.7	116	37.2	556	44.4
Range Median	1-15 8		1-15 8		1-15 8		1-15 6		1-15 6		1-15 6	
Outcome: Favorable (Improved)	35	16.9	37	17.3	38	17.7	11	7.1	11	7.1	154	12.3
Unfavorable (Stable condition)	156	75.4	159	74.3	159	73.9	144	92.3	144	92.3	1043	83.2
Death	16	7.7	18	8.4	18	8.4	1	0.6	1	0.6	56	4.5