Gavin Publishers
Emergency Medicine Investigations
Volume 2016; Pages 4
Ünaldi M et al.

Research Article

Description of Patients Presented to the Emergency Department with Ischemic and Hemorrhagic Cerebrovascular Accident

Mehmet Ünaldi[1]*, Bülent GÜzel[2], Birdal Yildirim[3], Hatice EryİĞİt[4] and Didem AY[1]

[1]Istanbul Medeniyet University, Göztepe Training and Research Hospital, Istanbul, Turkey

[2]Eyüp State Hospital, Istanbul, Turkey

[3]Sıtkı Koc man University School of Medicine, Muğla, Turkey

[4]Dr Lütfi Kırdar Kartal Training and Research Hospital, Istanbul, Turkey

***Corresponding author:** Mehmet Ünaldi, Istanbul Medeniyet University, Göztepe Training and Research Hospital, Gümüşpınar Mah. YalıSok. DemirliparkSitesi D-5, YakacıkKartal 34876 İstanbul, Turkey, Tel: +90 532 4972131; E-mail: drmun@hotmail.com

Citation: Ünaldi M, GÜzel B, Yildirim B, EryİĞİt H, AY Didem (2016) Description of Patients Presenting to the Emergency Department with ischemic and Hemorrhagic Cerebrovascular Accident. Emerg Med Inves 2016: 20-23.

Received: 23 May, 2016; **Accepted:** 14 June; 2016; **Published:** 28 June, 2016

Abstract

Background and Objective: Cerebrovascular accident cases represent a significant proportion of emergency department visits. Due to the scarcity of data on emergency visit characteristics of Turkish patients with cerebrovascular accident, we decided to examine characteristics of subjects presenting to our emergency department with stroke.

Material and Method: All patients over 18 years of age presenting to the emergency department were included in this study. From a diagnostic viewpoint, patients were classified into two groups as those with an ischemic or hemorrhagic etiology, with further subclassification within the groups. In addition, concomitant conditions were examined.

Results: A total of 450 individuals with a mean age of 65.9 years who had cerebrovascular accident were included. Among the elderly group of subjects (>45 years of age) with cerebrovascular conditions, ischemic or hemorrhagic etiology comprised 80% and 20% of the cases, respectively. There were 25 patients less than 45 years of age, representing 5.6% of the overall population. Most frequent concomitant conditions were diabetes and hypertension.

Discussion: In this study examining patients presenting to an emergency department with cerebrovascular conditions, ischemic strokes comprised the majority of the cases. The number of patients diagnosed with MRI (Magnetic Resonance Imaging) was significantly lower. Further studies will help to better define the characteristics of these patients.

Keywords

Cerebrovascular accident; Ischemia; Hemorrhage

Introductıon

Cerebrovascular Diseases (CVD) are a major cause of mortality and disability worldwide, representing the third leading cause of death after coronary disease and cancer. Another issue specifically related with CVD is the large economical burden associated with disability [1]. Stroke is available in more than half of cerebrovascular patients. It may be generally defined as any disease process that interrupts blood flow to the brain. An understanding of the diagnosis and treatment of stroke must begin with a working knowledge of

the relevant vascular supply and neuroanatomy of the brain. Stroke is classified as resulting from two major mechanisms: ischemia and hemorrhage. Ischemic strokes, which account for 87% of all strokes, are categorized by cause as thrombotic, embolic, or hypo perfusion related. Hemorrhagic strokes are subdivided into intra cerebral (accounting for 10% of all strokes) and non traumatic subarachnoid hemorrhage (accounting for 10% of all strokes) [2]. The final common pathway for all these mechanisms is altered neuronal perfusion. The early detection of stroke must begin with the general public [3]. Much work has been done in the prehospital setting to improve rapid neurologic screening for stroke. The diagnosis of stroke in the ED (Emergency Department) rests on the bedrock of a focused, accurate history taking and physical examination [4]. Time is a critical component in the care of stroke patients. Accurate determination of the time of onset of the patient's symptoms is essential [5].

In Turkey, previous studies examining patients with stroke who were initially seen in the emergency department were performed by research teams from three different geographical locations, namely Akdeniz University, Ege University, and Zonguldak Karaelmas University [6-8]. On the other hand, a very large number of patients with CVD attend to emergency units with stroke-related manifestations in Marmara Region, and particularly in Istanbul. In this study, we examined the demographic, clinical, and radiological characteristics of the patients presented to the ED.

Materials and Methods

For the purposes of this descriptive study, a retrospective file search based on hospital database was performed for patients attending to the emergency unit of Dr Lutfi Kirdar Kartal Training and Research Hospital between 1 December 2010 and 1 July 2011 with cerebrovascular accident.

All patients over 18 years of age presenting to the emergency unit with first or recurrent stroke were included, with no exclusion criteria. Before the study procedures were commenced, a special form was prepared for the study that gathered information on age, gender, diagnosis, CT and MRI findings, and etiological classification (i.e. ischemia, hemorrhage, cerebral venous thrombus, hypertensive encephalopathy, transient ischemic attack). Hemorrhagic stroke was further sub-classified as subarachnoid, intra ventricular, or intra-cerebral bleeding. In addition, concomitant diseases were recorded.

Imaging studies with CT or MRI were classified separately for ischemic and hemorrhagic strokes. The following descriptive scheme was used for CT and MRI findings of the cases with ischemic etiology: a) no signs, b) MCA (Middle Cerebral Artery) involvement, c) ACA (Anterior Cerebral Artery) involvement, and d) VBS (Vertebro Basilar System) involvement.

The corresponding scheme for hemorrhagic incidents was as follows: a) no signs, b) intra cerebral, c) intra ventricular, and d) subarachnoid.

Patients below the age of 45 years were considered as having early cerebrovascular accident. The distribution of diagnostic subgroups (i.e. ischemic, hemorrhagic, venous thrombus, transient ischemic episode etc.) according to age and gender was determined.

Statistical analysis

Statistical analyses were performed by Statistical Package for the Social Sciences (SPSS Inc. Chicago, IL, USA) 11.0 program. Data are presented as mean ± standard deviation or frequency (percentage), where appropriate.

Results

Patient distribution

Data of 450 stroke patients were reviewed (200 male, 250 female, M/F ratio 0.8). The mean age of the patients was 65.9±14.8 years. Table 1 shows the distribution of the cases by etiology and age group. Majority of the cases had ischemic stroke (n=358, 80%). Patients >45 years of age comprised 94% of all cases.

Figure 1 shows gender distribution of the patients by stroke type (hemorrhagic or ischemic) and age group. In hemorrhagic type; <45 age, male/female: 57% /43%,>45 age male/female: 49%/ 51%. In ischemic type; <45 age male/female: 56%/44%, >45 age male/female: 42%/58%. Three cases died at the emergency care unit (0.7%).

Etiology	All patients n=450	Age <45 n=25	Age >45 n=425
Hemorrhage	92 (20.5%)	7 (28.0%)	85 (20.0%)
Subarachnoid	38 (8.5%)	6 (24.0%)	32 (7.5%)
Intracerebral	47 (10.5%)	0	47 (11.1%)
Intraventricular	7 (1.5%)	1 (4.0%)	6 (1.4%)
Ischemia	358 (79.5%)	18 (72.0%)	340 (80.0%)
Arterial occlusion	214 (47.5%)	5 (20.0%)	209 (49.1%)
Transient ischemic attack	133 (29.5%)	7 (28.0%)	126 (29.7%)
Cerebral venous thrombosis	11 (2.5%)	6 (24.0%)	5 (1.2%)

Table 1: Distribution of the cases by etiology, disease subgroups and age.

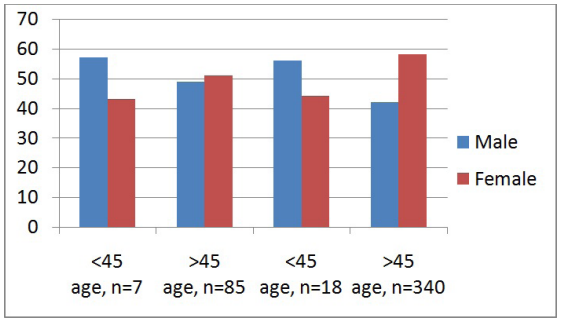

Figure 1: Rates by age of ischemic and hemorrhagic stroke patients.

Imaging studies

In all patients with hemorrhagic stroke (n=92), the hemorrhage was localized using computerized tomography.

In 213 ischemic cerebrovascular accident patients with arterial occlusion, 201 and 49 underwent computerized tomography and MRI/diffusion MR, respectively. Computerized tomography did not reveal any finding in 175 cases, whereas ischemia findings were evident in 26 cases (1 in anterior cerebral artery , 24 in middle cerebral artery , and 1 in vertebrabasillar system). MRI did not reveal any ischemic imaging in 21 of 49 patients examined and 28 showed ischemia findings (3 in anterior cerebral artery, 12 in middle cerebral artery, and 13 in vertebrabasillar system).

Concomitant diseases

Table 2 shows the frequencies of additional conditions by stroke type. Hypertension was the most common isolated co-morbid condition in both hemorrhagic stroke and ischemic stroke patients.

Co-morbid condition	Hemorrhagic stroke n=56	Ischemic stroke n=224
Diabetes	1 (1.1%)	19 (5.3%)
Hypertension	31 (33.7%)	65 (18.2%)
Cardiac disease	2 (2.2%)	21 (5.9%)
COPD	-	3 (0.8%)
Multiple co-morbidities	22 (23.8%)	116 (32.3%)

Table 2: Distribution of co-morbid conditions by stroke type, COPD: Chronic Obstructive Pulmonary Disease.

Discussion

All stroke patients older than 18 years of age attending to our emergency unit were included in this study. With regard to similar previous studies from Turkey, the mean age of our participants (65 years) was comparable to only to that of (63 years) the study from Akdeniz University [6]. As compared to the latter study, there were slightly more women in our study than men. In the study from Ege University, man represented a greater proportion of the study subjects [7]. Most of the studies from different countries report a similar male to female ratio, and our findings are in line with previous reports. However, the mean age of our patients is lower as compared to North Europe and North America, probably related to a shorter life expectancy in developing countries such as ours [9].

Only three of our patients died during the emergency care. Although the exact number of patients intubated and transferred to the intensive care could not be determined, we believe that this number should be high. A further examination of the data will shed more light on the cause of intubation and on the number of patients intubated. It is likely that a certain proportion of intubated patients may have died during the intensive care, since the very low number of deaths in the emergency unit suggests a high rate of intubation among stroke patients.

Early stroke patients comprised 5.6% of the total stroke cases, as compared to a previously reported rate of 5% for patients less than 45 years of age in the Emergency Unit of Ege University Medical School. This is similar to the previous reports from a number of different countries that suggest a 3 to 5% representation rate for stroke cases below 45 years of age in the overall study populations [8]. In our study, ischemic and hemorrhagic strokes comprised 80% and 20% of all stroke cases, which is similar to a previous report from the Neurology Department from our institution and to other studies reported in the literature [10]. The primary risk factors for stroke include hypertension, diabetes, and high cholesterol [11-13], as reflected by a high number of study subjects with concomitant hypertension and cardiac disease in our study, in both ischemic and hemorrhagic stroke subgroup. The significance of these risk factors for stroke in Turkish populations was previously demonstrated [10].

Our results are also parallel with the reports from a number of Asian and Middle East countries. Established risk factors for ischemic stroke include high blood pressure, high cholesterol, stenosis in the carotid arteries, coronary artery disease, and atrial fibrillation. The most common concomitant condition in cases with hemorrhagic stroke, which comprised nearly one fourth of the total cases, was hypertension, consistent with literature data [14,15]. A CT scan was performed during the initial presentation in the emergency department in approximately 98% of our patients, indicating ready access to CT facilitating diagnosis. While it was not possible to detect any pathological CT signs in 82% of the stroke cases within the first 24 hours, in the remaining 18% cases signs of ischemia were present in MCA, ACA, and VB. In 12 cases (5.6%) the findings could not be interpreted. These results demonstrate that computed tomography may not be able to detect any signs of ischemia in the early (i.e. 24-48 hrs) period post-stroke. Of the 213 cases with a pre-diagnosis of ischemic stroke, an MRI was performed in only 49, with no signs detected using the conventional MRI in 21 subjects (42.9%). In the remaining patient group, signs of ischemia were present in MCA, ACA, and VB. Despite widespread availability of CT, its diagnostic value in the early post-stroke period is lower than that of MRI as shown by numerous studies, underscoring the importance of a comprehensive clinical and neurological assessment. Although MRI was able to detect diagnostic clues in nearly half of the cases, its diagnostic value is still lower as compared to diffusion MRI.

Study limitations

Patients less than 18 years of age presented to the emergency unit with stroke were excluded from the study.

Conclusion

These data provide information on several patient characteristics in stroke cases such as age, gender, and type of stroke. Further studies will provide information on other aspects of these patients such as the time to presentation to

emergency department, delay before presentation, percentage of patients intubated, mortality rates, and treatments administered, which will help to better define management strategies and to improve the level of care at the institutional level.

Conflict of Interest Statement

No conflict of interest was declared by the authors.

Financial disclosure

The authorsdeclared that this study has received no financial support.

References

1. Refik Saydam Hıfzıssıhha Merkezi Başkanlığı, Hıfzıssıhha Mektebi Müdürlüğü (2004) Başkent Üniversitesi. Ulusal hastalık yükü ve maliyet-etkililik projesi hastalık yükü final rapor. Aralık.
2. Lloyd-Jones D, Adams RJ, Brown TM, Carnethon M, Dai S, et al. (2009) Heart disease and stroke statistics 2010 update: a report from the American Heart Association. Circulation; 121: e46, 2010. Epub Dec 17.
3. Schneider AT, Pancioli AM, Khoury JC, Rademacher E, Tuchfarber A, et al. (2003) Trends in community knowledge of the warning signs and risk factors for stroke. JAMA; 289: 343.
4. Goldenstein LB, Simel DL (2005) Is this patient having a stroke?. JAMA; 293: 2391.
5. Adams HP Jr, del Zoppo G, Alberts MJ, Bhatt DL, Brass L, et al. (2007) Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working groups: the American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists. Stroke; 38: 1655.
6. Emre U, Demir AS, Acıman E, Çabuk N, Kıran S, et al. (2009) Acil serviste değerlendirilen nöroloji hastalarının profili. Türk Nöroloji Dergisi; 15: 134-39.
7. Hakbilir O, Çete Y, Göksu E, Akyol C, Kılıçaslan İ (2006) İnme popülasyonunun demografik özellikleri ve geç acil servis başvurularının yeni tedavi yaklaşımları üzerine etkisi. Turk J Emerg Med; 6: 132-38.
8. Kıyan S, Özsaraç M, Ersel M, Aksay E, Yürüktümen A, et al. (2009) Acil servise başvuran akut iskemik inmeli 124 hastanın geriye yönelik bir yıllık incelenmesi. Akademik Acil Tıp Dergisi ; 8: 15-20.
9. Scott PA, Barsan WG (2000) Stroke and transient ischemic attack. In: Emergency medicine: a comprehensive study guide. Tintinnalli JE, Kelen GD, Stapcyznski JS; pp.1430-1439.
10. Türk Börü Ü, Gül L, Taşdemir M (2009) A hospital-based study on long-term mortality and predictive factors after spontaneous intra cerebral hemorrhage from Turkey. Neurology Asia; 14: 11-14.
11. Kabakcı G, Abacı A, Ertaş FS, Özerkan F, Erol Ç, (2006) Türkiye'de hipertansif hastalarda inme riski ve inme riski açısından bölgesel farklılıkların belirlenmesi: hastane tabanlı, kesitsel, epidemiyolojik anket. THINK çalışması. Arch Turk Soc Cardiol; 34: 395-405.
12. Kumral E, Balkır K (2002) İnme epidemiyolojisi. In: Serebrovasküler Hastalıklar. Balkan S, Ankara, Güneş Kitabevi, 2002, pp.38-47.
13. Ringleb PA, Bousser MG, Ford G, Bath P, Brainin M, et al. (2008) Guidelines for management of ischaemic stroke and transient ischaemic attack. Cerebrovasc Dis; 25: 457-507.
14. Qureshi AI, Tuhrim S, Brodrick JP, Batjer HH, Hondo H, et al. (2001) Spontaneous intracerebral hemorrhage. New Eng Med; 344: 1450-1461.
15. Takahashi O, Cook EF, Akamura T, Saito J, Ikawa F, et al. (2006) Risk stratification for in-hospital mortality in spontaneous intracerebral hemorrhage: a classification and regression tree analysis. QJ Med; 99: 743-50.