

Evaluation of Clinical and Radiological Findings of Patients Diagnosed Spontaneously Intracerebral Hematoma

Spontan İntraserebral Hematom Tanısı Konulan Olguların Klinik ve Radyolojik Bulgularının Analizi

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ÖZET

Amaç: Spontan intraserebral hematom, genellikle hipertansif değişikliklere bağlı, serebral vasküler yapıların rüptürü sonucu serebral parankim içine kanama olmasıdır. İnmelerin sık nedenlerinden olup, mortalite ve morbiditesi oldukça yüksektir. Bu çalışmamızda acile başvuran spontan intraserebral hematomlu olguların demografik, klinik ve radyolojik özelliklerini literatür ışığında analiz ettik.

Yöntemler: Bu çalışma, spontan intraserebral hematom tanısı konulan 27'si kadın ve 36'sı erkek olmak üzere toplam 63 hasta üzerinde retrospektif olarak yapıldı. Hastaların; yaş, cinsiyet, eşlik eden sistemik hastalıklar, oral antikoagülan kullanımı, başlangıç GKS'ü, nörolojik muayene bulguları, hematomun lokalizasyonu, hematomun volümü gibi verileri incelendi.

Bulgular: 63 hastanın %57'si erkek idi. Hastaların %62'si 65 yaş ve üstü idi. Sistemik hastalıklar içinde en sık eşlik eden %46 ile hipertansiyondu. Hastaların %29'u oral antikoagülan kullanıyordu. Sıklıkla bilinç değişikliği (%44) ve motor defisit (%44) ile başvurdular. Hastaların geliş GKS'si % 55 oranında 13- 15 puan arasındaydı. Bilgisayarlı tomografi görüntüleri incelendiğinde hematomların en sık lobar (%47) yerleşimli olduğu izlendi. Hematomların %56'sının volümü 30 cm³'ün altındaydı.

Sonuç: Spontan intraserebral hematom tanısında, demografik, klinik ve radyolojik özelliklerin dikkatle incelenmesi oldukça önemlidir. Çalışmamızın retrospektif analizindeki verilerin literatür ile büyük ölçüde paralellik gösterdiğini saptadık.

Anahtar Kelimeler: Acil servis, retrospektif, spontan intraserebral kanama

ABSTRACT

Objective: Spontaneous intracerebral hematoma is bleeding into the cerebral parenchyma as a result of rupture of cerebral vascular structures. It is one of the common causes of stroke, and its mortality and morbidity is quite high. In this study, we analyzed the demographical, clinical and radiological features of patients with spontaneous intracerebral hematoma presenting to the emergency department in the light of the literature.

Methods: This study was carried out retrospectively on a total of 63 patients, 27 female and 36 male, who were diagnosed with spontaneous intracerebral hematoma. Patients; data such as age, gender, accompany systemic diseases, oral anticoagulant use, initial GCS, neurological examination findings, hematoma localization and hematoma volume were analyzed.

Results: The male percentage of 63 patients was 57%. Proportion of patients aged 65 and over was 62%. Among the systemic diseases, the most common comorbidity was hypertension with 46%. 29% of the patients were using oral anticoagulants. They frequently presented with altered consciousness (44%) and motor deficit (44%). The admission GCS of the patients was between 13-15 points at a rate of 55%. When computed tomography images were examined, it was observed that hematomas were most commonly located in the lobar (47%). The volume of 56% of the hematomas was below 30 cm³.

Conclusions: In the diagnosis of spontaneous intracerebral hematoma, careful examination of demographical, clinical and radiological features is very important. We found that the data in the retrospective analysis of our study were significantly compatible with the literature.

Key words: Emergency department, retrospective, spontaneous intracerebral hematoma



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INTRODUCTION

Spontaneous intracerebral hematomas (SICH) occur as a result of rupture of small penetrating vessels located in the cerebral lobes, thalamus, basal ganglia, pons, and cerebellum, usually secondary to hypertensive changes (1,2). It is one of the most common causes of acute stroke in the world and is associated with high mortality and morbidity (3). It is closely related to hypertension, and its incidence has been reported to decrease in developed countries where high blood pressure is more frequently controlled (4). Definitive diagnosis is made by brain computed tomography (CT). In the prognosis of the disease; In addition to clinical features such as the patient's age, glaskow coma score (GCS), neurological examination, co-morbidities and anticoagulant use, radiological features such as the volume and localization of bleeding also play an important role (5,6).

Clinical worsening and an increase in hematoma size after symptom onset have been reported in approximately one-third of SICH patients admitted to the emergency department within the first 3-6 hours(7). Therefore, prevention of hematoma growth is important for early SICH management(8). Rapid diagnosis, stabilization of hemodynamic parameters and intracranial pressure are vital in order to minimize progression and secondary damage in patients presenting to the emergency department with SICH (9).

In this article, the cases who applied to the emergency department and were diagnosed with SICH; We presented the demographic, clinical and radiological features by comparing them with the literature data.

MATERIAL AND METHOD

This study was carried out retrospectively on patients who applied to the emergency department of Bilecik Training and Research Hospital between 2018 and 2021 and were diagnosed with SICH. Ethics committee approval was obtained for this study (decision date and number : 01.03.2022 / 3). Our study was conducted with a total of 63 adult patients, 27 women and 36 men. The epicrisis reports of patients diagnosed with SICH were evaluated under 3 main headings: demographic, clinical and radiological.

In demographic evaluation; Age (>65 years, <65 years old), gender (female, male), accompanying systemic diseases (hypertension, cardiac diseases, diabetes, ischemic cerebrovascular disease and chronic kidney failure), use of anticoagulant drugs (yes, no) A total of 4 different parameters were examined. In clinical evaluation; Initial GCS and neurological examination findings were evaluated. GCS; It was classified as mild (13-15 points), moderate (6-12 points) and severe (3-5 points). Neurological examination, on the other hand, was collected under a total of 4 titles: altered

consciousness, motor deficit, speech disorder and facial paralysis.

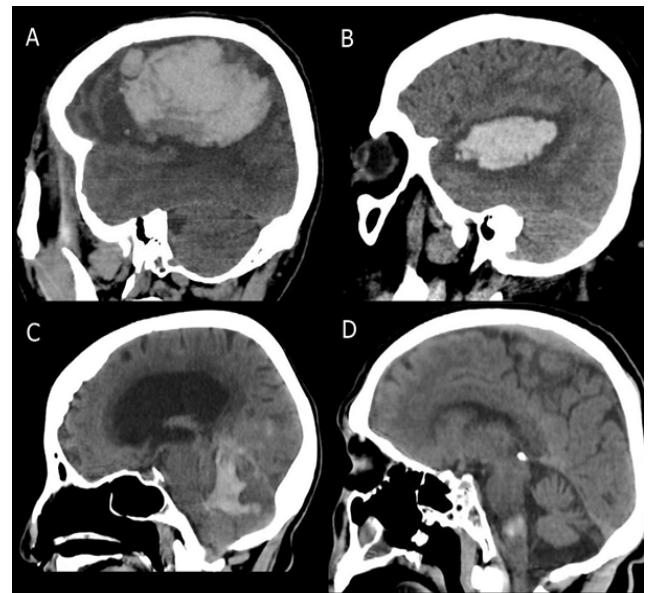
In the radiological evaluation; Localization of hematomas and hematoma volumes were examined. Hematoma localizations; were evaluated under the headings of lobar (frontal, parietal, temporal, occipital), deep (thalamic, putaminal, basal ganglia), cerebellar and brainstem (mesencephalon, pons, bulbus) (Figure 1). Hematoma volumes were calculated as <30 cm³ and >30 cm³.

Exclusion criteria

Pediatric (< 18 years) cases, history of trauma, and patients with previous intracerebral hematoma for any reason were not included in this study. In addition, due to the inability to calculate the hematoma volume in brain computed tomography (CT) imaging, patients with ventricular hematomas and incomplete data in epicrisis reports were excluded from the study. Besides these; Patients with subdural, epidural, and subarachnoid hematomas were not included in the study.

RESULTS

Of the 63 patients diagnosed in the emergency department with spontaneous intracerebral hematoma, 27 (43%) were female and 36 (57%) were male. 24 patients (38%) were <65 years and 39 patients were 65 years and older (62%). When the accompanying systemic diseases of these patients were examined, hypertension in 38 (46%), cardiac diseases in 16 (20%), ischemic cerebrovascular disease (CVD) in 7 (8%),



A: Lobar , B: Deep, C: Cerebellar, D: Brainstem

Figure 1. Sagittal section images of hematoma localizations observed in brain CT

Table 1. Demographic characteristics of the patients

Age	<65	24
	>65	39
Gender	Female	27
	Male	36
Additional Diseases	HT	38
	Cardiac	16
	Ischemic CVD	7
	Diabetes	6
	CRF	3
	None	12
Anticoagulant	Yes	18
	No	45

*CRF: Chronic renal failure, CVD: Cerebrovascular disease, HT: Hypertension

diabetes mellitus in 6 (7%) and chronic renal failure in 3 (3%) it was found. It was observed that 12 (16%) of the patients did not have any additional disease. It was learned that some of the patients had more than one additional disease. When the drug data of the patients were examined, it was determined that 18 patients (28%) used oral anticoagulant (OAC) drugs and 45 patients (72%) did not use OAC (Table 1).

Major findings in the first neurological examinations of the patients; It was observed that 32 (44%) had altered consciousness, 32 (44%) had motor deficits, 5 (6%) had speech disorders and 4 (6%) had facial paralysis. Some of the patients had more than one major neurological examination findings. Considering the glasgow coma scores of the patients; 35 (55%) were mild, 20 (32%) were moderate, and 8 (13%) were severe. (Table 2).

Considering the localization of hematomas in the first brain CT scans of the patients; It was observed that 30 (47%) were lobar, 25 (40%) deep, 5 (8%) cerebellar and 3 (5%) brainstem. When the volumes of hematomas are examined; It was calculated that 35 (55%) were <30 cm³ and 28 (45%) were >30 cm³ (Figure 2).

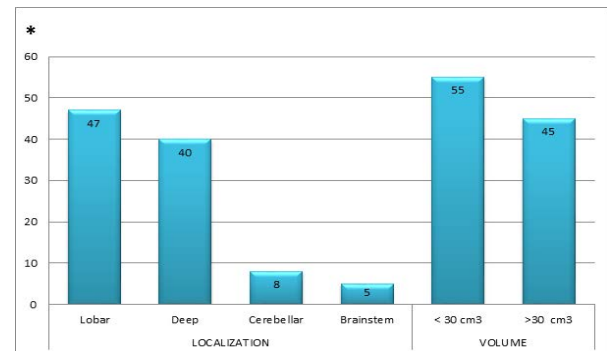
DISCUSSION

Spontaneous intracerebral hematomas refer to the filling

Table 2. Clinical characteristics of the patients

Neurological Examination	Unconsciousness	32
	Motor deficit	32
	Speech disorder	5
	Facial paralysis	4
	GCS	
GCS	Mild (13-15)	35
	Moderate (6-12)	20
	Severe (3-5)	8

*GCS: Glasgow coma score



* Indicated in percentage (%)

Figure 2. Proportional data of hematoma localizations and volumes of patients

of blood into the cerebral parenchyma as a result of sudden rupture of cerebral vascular structures due to various reasons without trauma. Its incidence in the general population is 12-15 per 100,000. In the elderly population, this rate rises to 200/100,000 due to accompanying systemic diseases (10).

As age increases, the risk of SICH increases and this risk doubles in every decade (11). When the relationship between age and prognosis was examined, it was shown in a study that there was a directly proportional relationship between patient age and prognosis (12). In a study, the average age of the patients was stated as 65. When the distributions by age groups are examined, it is found that 23% under 55 years old and 29% over 75 years of age (13). In our study, the mean age of 63 patients was 68 years. While 38% of these patients are <65 years old, 62% of them are 65 years and older, these data are compatible with the literature. The increase in the frequency of SICH in advanced ages can be explained by the fact that cerebral vascular structures become more fragile and the prevalence of hypertension (HT) increases.

A positive relationship was found between male gender and SICH. In the case-control studies of Ariesen et al. the odds ratio was found to be 1.35, and in cohort studies, this ratio was found to be 4.64 (14). Studies investigating the relationship between gender and prognosis have also been reported. According to this; In a study by Davis et al. it was accepted that gender is not a determining factor on prognosis, while in a study by Castellanos et al., female gender was reported to be associated with a good prognosis (15,16). In our study, 27 (42%) of 63 patients were female and 36 (58%) were male, which is consistent with the distribution reported in the literature. The high rate of male reported in the studies resulted in the acceptance of male gender as a risk factor.

When the etiology of spontaneous intracerebral hematomas was examined, it was stated that diseases such as hypertension, amyloid angiopathy, vascular anomalies and

coagulopathies played a role (17). Among them, especially the history of hypertension often plays a role in the etiology. In a multicenter study conducted in our country, the history of HT was reported to be 79.2% in patients undergoing SICH (18). Sandoval et al. They found that the most common cause of SICH was HT (69%), and obesity was the second most common (19). In a study examining the relationship between a history of HT and mortality, it was reported that high blood pressure was closely associated with mortality and morbidity (20). Considering the résumés of the patients in our study; 38 (46%) had hypertension, 16 (20%) had cardiac disorders, 7 (8%) had ischemic CVD, 6 (7%) had diabetes, 3 (3%) had chronic renal failure. While there was no known systemic disease in 12 patients (16%). Although the rate of HT history in our patients is lower than those reported in the literature, it seems to be in the first place in the etiology in our country as well.

Oral anticoagulant use is considered an important predisposing factor in the development of spontaneous intracerebral hematoma. It has been reported that the use of anticoagulants causes an increase in the volume of the hematoma and is associated with a poor prognosis (21). In another study, it was determined that approximately 20% of SICHs used OAC, and it was reported that the risk of SICH occurrence was 7-10 times higher in patients receiving OAC treatment (22). In our study, while 18 (28%) of the patients were using oral anticoagulants, 45 (72%) were not. This rate is consistent with the data reported in the literature.

Patients with spontaneous intracerebral hematoma may present to the clinic with many different symptoms ranging from mild headache to coma. Of these, 8-18% of patients present with acute stroke (23). In a study examining the state of consciousness of patients upon arrival, it was reported that 55% of the patients were conscious, while 45% had a change in consciousness (24). In our study; 32 (44%) had altered consciousness, 32 (44%) had motor deficits, 5 (6%) had speech disorders, and 4 (6%) had facial paralysis. These data seem to be compatible with the literature.

The admission GCS of the patients is one of the important parameters that play a role in the prognosis. Eroglu et al. In a study of 104 cases, it was reported that there were 61 patients (58%) with a GCS of <7 and 43 patients (42%) with a GCS of >7 in the evaluation of baseline GCS (25). In another retrospective study, it was reported that 9 (22%) of the patients had a GCS <5, 26 (63%) had a GCS of 5-12, and 6 (15%) had a GCS of 13-15 (26). In our study, the initial GCS of the patients was; 35 (55%) had a GCS <5, 20 (32%) had a GCS of 6-12, and 8 (13%) had a GCS of 13-15. Contrary to what has been reported in the literature, our patients mainly comprised the group with a GCS score of 13-15.

Although the localization of the hematoma is in the

cerebral hemispheres with a frequency of 80%, different rates of bleeding localizations have been reported in the literature. In a study, it was reported that putaminal hematomas were the most common with a rate of 34% (27). In another study, it was reported that 55% of hematomas were deep, 41% were lobar, and 4% were pontine (25). When the hematoma localizations in our study were examined, 47% were lobar, 40% were deep, 8% were cerebellar, and 5% were brainstem. While the most common localization reported in the literature was deep localization, lobar hemorrhages were in the first place in our data.

The volume of the hematoma plays an important role in the prognosis of patients with spontaneous intracerebral hematoma, as well as its localization. In a study, it was shown that only one of 71 patients with parenchymal hemorrhage larger than 30 cm³ could live independently in daily life 30 days after the acute event (28). Tuhirim et al. reported in their study that there was a significant increase in the mortality rate when the hematoma volume exceeded 30 cm³ (29). Eroglu et al. in his study, it was reported that there were 59 (56%) patients with <30cm³ and 45 (44%) patients with >30cm³25. When the hematoma volumes of the patients in our study were calculated; It was determined that 55% were <30 cm³ and 45% were greater than >30 cm³. These data show parallelism with the rates reported in the literature.

In the diagnosis of spontaneous intracerebral hematoma, it is of great importance that the parameters such as gender, age, trauma history, accompany systemic diseases, oral anticoagulant use are questioned in detail, and that the presenting GCS and neurological examination findings are meticulously performed. Careful evaluation of the localization and volume of the hematoma in brain CT can guide the prognosis.

CONCLUSION

As a result; We found that the demographical, clinical and radiological data of the cases in our study, which we analyzed retrospectively, were significantly similar to the articles reported in the literature.

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