Research Article

Frequency and Clinical Characteristics of Patients with Subarachnoid Hemorrhage (SAH) referred to Ardabil Hospital during 2012-2017

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Abstract

Background and objective: Subarachnoid Hemorrhage (SAH) usually occurs due to the rupture of a cerebral artery aneurysm. About 9 million people suffer worldwide. According to the importance of SAH in the province, the aim of this study was to investigate the Frequency and clinical characteristics of patients with Subarachnoid Hemorrhage (SAH).

Methods: This descriptive cross-sectional study was performed on 109 patients with SAH who were referred to Alavi Hospital during 2012-2017. Demographic data and clinical information were extracted from the patient's hospital records and then analyzed by statistical methods in SPSS version 21.P-value less than 0.05 was considered significant.

Results: The mean age of patients was 58.33 ± 14.39 years. 63 patients (58.8%) were female and the rest were male. The most common past medical history was high blood pressure. The most common symptom was headache. 77 patients (77.6%) died. There was a meaningful relationship between sex and the mortality of patients. The most common angiographically confirmed aneurysm was MCA; seen in 34% of the angiograms. SAH was visible on CT-scan in 70.7% of patients. The most prevalent symptom in the first three months after surgery was motor symptoms. 27.5% of the surviving patients had memory problem, being the most common residual symptom in the first 6 months after surgery.

Conclusion: The most common presenting symptom in patients with subarachnoid hemorrhage is headache. A majority of patients had a history of high blood pressure. A majority of the patients died during the initial hospitalization. We conclude that patients with high blood pressure and acute thunderclap headache should undergo emergent diagnostic work-up to rule our aneurismal subarachnoid hemorrhage.

Introduction

Stroke is a syndrome which is characterized by the onset of acute neurological symptoms lasting 24 hours and confirmed by imaging studies such as CT scan and MRI [1]. In an ischemic stroke, blockage of a blood vessel disrupts the blood flow to a particular area of the brain and affects the function of that area of the brain but in brain hemorrhage side-effects such as cerebral edema, increasing intracranial pressure, and compression on the surrounding brain and the spread of blood from the subarachnoid causes neurological deficit [2]. Intracranial hemorrhage based on location of the bleeding is divided into intracerebral, intraventricular, subarachnoid, subdural and epidural hemorrhage. Except for subdural hemorrhage, others types of hemorrhages are caused by arterial bleeding. Intracerebral hemorrhage with the destruction of adjacent tissue causes headache and neurological defects associated with the territory of the ruptured artery [3,4]. Subdural or epidural hemorrhage creates mass effect by compressing the underlying brain tissue. Subarachnoid Hemorrhage is usually caused by rupture of a cerebral aneurysm or an arteriavenous malformation (AVM). Rupture of aneurysm is the cause of 75% of subarachnoid hemorrhages which is often seen in the fifth to sixth decades of life and is almost equal in sexual distribution [5-7]. Aneurysms are flow-related and are caused by weakening and enlargement of the wall of the artery. Intracranial arteriovenous malformations cause 10% of subarachnoid hemorrhage and the prevalence in men is twice that of in women. Also, the presence of blood in the subarachnoid space can be due to trauma. The most important feature of SAH is its severe headache; many patients report that the experienced headache in SAH is the worst headache of their lives [10,11]. The headache is assumed to activate the sympathetic system increasing the blood pressure stress hormones that can cause re-rupture. Signs and symptoms of SAH were variable and in10-50% of cases, they are often misdiagnosed. The most common symptoms are headache (48%), dizziness (10%), orbital pain (7%), diplopia (4%)
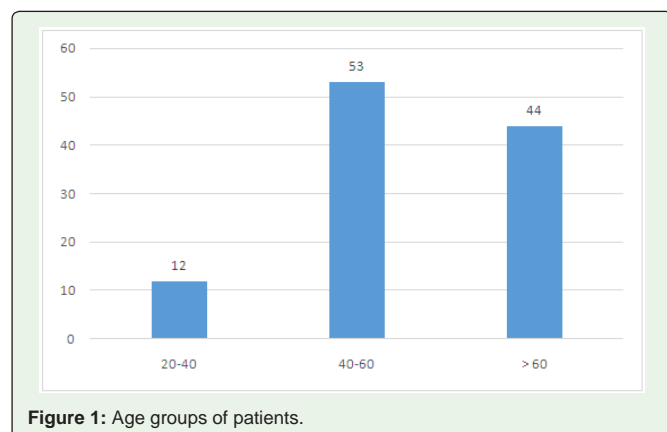
Figure 1: Age groups of patients.

and loss of vision (4%). These signs and symptoms usually appear in 10 to 20 days before the rupture and due to leakage or expansion of the aneurysm, or embolism [5]. Considering the importance of SAH disease, its mortality and morbidity, the necessity of timely diagnosis and also due to the low number of studies in this field in this province of the country, the aim of this study was to study the frequency and clinical characteristics of patients with SAH referred to Ardabil city hospital.

Material and Methods

This study was a descriptive cross sectional study on 109 patients with SAH, referred to Alavi hospital in Ardabil city during 2012-2017. All of the patients completed the consent form and patients without SAH were excluded from the study. Patients' demographic and clinical data such as age, gender, history of previous illnesses and CT-scan and angiography results were extracted from patient records. Patients were followed up at 3 and 6 months intervals and the symptoms were monitored. Data were analyzed using descriptive and analytical statistical methods using SPSS v21. P value less than 5% was considered significant.

Results

109 patients (58.8%) were women and 41.2% were men. The average age of patients was 58.3 ± 14.3 and most of patients were in the age group of 50-60 (Figure 1). High blood pressure was the most common in their history (53.2%). CAV was the least common in their history (7.3%). The most common symptom was headache (51.6%). The headache was global and occurred in 50.3%. SAH was seen in 70/7% of the CT-scans. In 90.6% of the patients had no hydrocephalus. Among patients who underwent angiography, MCA-aneurysm was most common (34.3%) (Table 1). 70.6% of patients died; 38.5% on admission and the rest after surgery. The mortality rate in women was 79.3% higher than that of men, which was statistically significant (Table 2). The most and the least common symptom of the

Table 1: Clinical characteristics of patients.

Clinical Characteristics		n	%
History of disease	HTN	58	53.2
	IHD	17	15.6
	HLP	14	12.8
	DM	12	11.1
	CVA	8	7.3
Headache symptoms	Headache	83	76.1
	Loss of consciousness	48	44
	Ataxia-seizure	16	14.7
	hemiparesis	11	10.1
	Blurred vision	3	2.8
Location of headache	All of head	42	50.6
	frontal	1	1.2
	occipital	37	44.6
	Neck pain	3	3.6
CT-scan results	SAH	77	70.6
	SAH+IVH	13	11.9
	ICH+IVH+ SAH	19	17.4
Angiographic results	Normal	6	18.8
	PCH	6	18.8
	MCA	11	34.3
	ACM	9	28.1
Hydrocephaly	yes	3	9.4
	no	29	90.6

Table 2: Relation between CT-scan finding and sex of patients with results of disease.

Result of disease		live		died		p-value
		n	%			
sex	Female	50	21.7	13	79.3	0.016
	Male	27	41.3	19	58.7	
CT-scan findings	SAH	46	40.3	31	59.7	0.25
	SAH+IVH	12	7.7	1	92.3	
	ICH+IVH+SAH	19	0	0	100	

Table 3: Frequency of symptom incidence after 3 or 6 month.

Disease symptoms Time duration of surgery	Without symptom		Reduce the visibility		Headache		Difficulty of speaking		Memory impairment		Motor symptoms	
3 month	7	15.2	3	6.5	6	13	5	11	11	23.9	14	30.4
6 month	7	17.5	3	7.5	6	15	3	7.5	11	27.5	10	25

disease at 3 months post-surgery was motor symptoms and memory impairment with 30.4% and 23.9%, respectively. At 6 months post-surgery, memory impairment and motor symptoms occurred in 27.5% and 25%, respectively (Table 3).

Discussion

In 2000, Ingall et al., conducted an epidemiological study on individuals aged 25 to 65 with the goal of examining the epidemiology of SAH worldwide. The annual prevalence of SAH was 2.5 in every 100,000 in the population of China and 25 in every 100,000 in the population of Finland and 12.7 per 100,000 populations in our study which was higher than the global average. The average age of patients in this study was 58.33 years, 58.8% were female and 41.2% were male. Khaghani et al., reported the average age of patients being 47.2years; 47.1% of them were male. Shabehpour et al., reported the average age of patients being 46.12 years and 46.36% were male that the results of studies on gender prevalence were consistent with the present study but in the study of Ingall et al., there was no specific gender pattern, which can be due to the difference in the sample size being investigated [12-14].

Prior to SAH, in the history, hypertension (HTM) was most common in the study (53.2%) and CVA was least common (7.3%). Thomas Laro et al., reported the most common pre-SAH factor being HLP. Sarsarshahi et al., reported HTN being the most common factor in SAH-patient's history, in line with our study results [15,16]. In this study, the most common aneurysm in cerebral angiography was MCA. In Khaghani et al., study, the most frequent findings in the angiography was AVM and MCA respectively which was in line with the current study [12].

In many other studies however, ACOM-aneurysm has been reported as the most frequent source of rupture. In female population, ruptured PCOM-aneurysm has been shown to be most common source of SAH.

Gender-specific mortality in our patients, showed a significant relationship between sex and mortality. In a study conducted between 1985-2000 in Sweden, there was no statistically significant relation between mortality and gender of patients [17], and in the study by Ingall et al., although there was no specific gender pattern, but the

mortality rate was higher in males than females, consistent with the present study [14]. According to MONICA Collaborating Center reports, about 8.8% of SAH patients die before receiving medical services. The general rate of death from an aneurysmal SAH prior to hospitalization varies between 30-50%. Of the SAH-patients that reach hospital and receive treatment, about 30% die within one month. In our study 38.5% of patients died at the time of admission which was higher than Monica study [14]. Headache was the most common symptom of the disease in subarachnoid hemorrhage that it has been mentioned in many studies. In the recent study, half of the patients complained of a headache so it can therefore act as an effective factor in identifying patients [18].

Conclusion

Considering the prevalence of SAH, the high risk of death and the significance of the relationship between mortality and gender of patients, more studies with higher sample size are warranted to investigate the risk factors involved in the incidence of SAH. Further studies on the etiologic of SAH can shed more light and help to improve living standards for the population and provide objective tools for decision makers in society and in the general health system.

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