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Prognosis of patients with primary intracerebral haemorrhage in Erbil city: evaluating presentation, location and outcome

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Abstract

Background and objectives: Primary intracerebral haemorrhage is the cause of a significant number of all strokes which carries a significant mortality rate and is a morbid disease. The present study aimed to investigate the clinical presentations, risk factors, outcome of primary intracerebral haemorrhage in Erbil city and to determine its prognostic factors. **Methods:** One hundred thirty six patients of both genders diagnosed as primary intracerebral haemorrhage were included in the current study, all of whom were admitted in Erbil hospitals. All patients had been seen by the neurologist for history taking and neurological examination and had a new brain CT scan. All patients were followed up for 6 months. **Results:** Neurological deficit and disturbed consciousness were the presenting symptoms in most patients (39.7%, 33.1%) respectively. Basal nuclei were the most frequent locations of haemorrhage (47.8%). The mortality rate was (34.6 %) after 6 months follow up. Advanced age, large size of the hematoma, midline shift, brain stem involvement, Glasgow coma scale below 8 carried poor prognosis. **Conclusions:** Clinical presentation, risk factors, outcome and prognostic factors of patients with primary ICH is similar to the same descriptions in the surrounding and other locations in the world.

Key words: Erbil, Intracerebral haemorrhage, Mortality.

Introduction

Among most neurologic diseases of adult life, stroke clearly ranks first in importance and frequency. At least half of the neurological disorders in a general hospital are of this type. Intracerebral haemorrhage is the third most frequent cause of stroke[1]. Intracerebral haemorrhage occurs in around (20%) of all strokes. Compared to ischaemic stroke, it more frequently results in increased disability and death[2]. The most significant risk factor is hypertension, which increases the risk of ICH by nearly four times. Improved hypertension control reduces the occurrence of intracerebral hemorrhage[3]. Many prognostic models have been validated, among these are, neurological features, other clinical parameters, and neuroimaging findings. Level of consciousness on admission (as the Glasgow coma scale [GCS] score) and hematoma volume are the most consistent outcome predictors[4]. Evaluation of prognostic factors in spontaneous ICH occurrence based on hematoma criteria has been performed by some investigators. Other investigators assessed the role of age, sex, history of hypertension, diabetes mellitus and cigarette smoking on ICH. Each factor appears to impact the outcome of study differently[5]. The present study aims to: determine the presentation of primary ICH and the clinical features of the patients on presentation, moreover, to determine the risk factors that resulted in the condition and to determine some prognostic factors. Another aspect of the study focuses on the radiological pattern of the haemorrhage, regarding its site and size, any intraventricular extension, and presence or absence of midline shift.

Patients and methods

In this case follow up study, data were collected between (July 2017- January 2019), from 136 patients with primary ICH, who were hospitalized in the Emergency department at Rhozhalat Emergency Hospital and Neurology Department at Rzgary Teaching Hospital in Erbil city.

All patients with symptoms and signs of hemorrhagic stroke were included in this study at the hospital within 1st or 2nd day of onset of symptoms. Patients were initially observed at the emergency department and subsequently admitted to the Department of Neurology after performing

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a brain computed tomography (CT scan). After admission and full clinical and neurological examination; laboratory tests (complete blood cell count, biochemical tests, and serum electrolytes), electrocardiography were obtained.

For each patient, demographic data (sex and age), history of any risk factors (the history of hypertension, diabetes mellitus, smoking) were collected. Arterial blood pressure and GCSs upon arrival and CT findings were recorded.

The anatomical sites and total volume of hematomas were determined according to the CT images. The volume of intracerebral hematoma was calculated by using the formula V = 0.5 × a × b × c (- is the largest diameter of hematoma, - the diameter versus -, and - the number of scans that shows hematoma6). The thickness of the scan through the back of the skull was 4 mm and 6 mm through the other parts. Sizes of hematoma of intracerebral haemorrhage were subdivided by the volume into three groups (0–29 ml=small size, 30–60 ml=medium size, and >60 ml=large size7). Anatomical sites in relation to the region of haemorrhage included basal nuclei, lobar, thalamus, cerebellum, and brainstem. Secondary hematoma extension to intraventricular region and midline shift were also assessed. Outcome variables included dead or alive, disability calculated according to Modified Ranking Scale (MRS): (0-no symptoms.

1. No significant disability.
2. Slight disability.
3. Moderate disability.
4. Moderately severe disability.
5. Severe disability
6. Death8).

The inclusion criteria were cases of new primary ICH, both sexes and age above 18 years, admitted and managed in hospital and have a new CAT scan. Exclusion criteria were: Pure intraventricular haemorrhage, pure subarachnoid haemorrhage, haemorrhagic tumour, hematological disorders, haemorrhage due to head injury, and age below 18 years. Statistical analysis was done by using SPSS program version 24. Frequency and percentage for all variables were found and means compared by using an independent sample T test. For test of independence between variables Pearson Chi square test was used and P value -0.05 considered as statistically significant. Ethical approval of this study has been received from the scientific committee of the Kurdistan Higher Council of Medical Specialties.

Results

The mean age of the included patients was 58.55±12.09 years, of whom (57.4%) were male and (42.6%) were female. Most patients' chief complaints were focal neurological deficit (39.7%) while (33.1%) of patients presented with disturbed consciousness. Headache, vomiting and seizure were less frequent complaints. During the further clinical assessment most patients (52.9%) found to have headaches and also on further inquiry (76.5%) of patients found to have some sort of disturbed consciousness.

The details of the clinical finding frequencies are shown in the Table (1).

Table (1): Clinical features and presentations of the patients

Variables	Clinical finding	No.	%
Chief Complaint	Focal neurological deficit	54	39.7%
	Disturbed consciousness	45	33.1%
	Headache	4	2.9%
	Vomiting	6	4.4%
	Seizure	7	5.1%
	two or more symptoms	20	14.7%
Headache	Yes	72	52.9%
	No	64	47.1%
Disturbed Consciousness	Yes	104	76.5%
	No	32	23.5%
Focal neurological deficit	Yes	127	93.4%
	No	9	6.6%

By further examination and assessment 34 patients were found to have (GCS) less than or equal to 8 of whom 24 patients died after 6 months of follow up. There was a highly significant association between death and GCS <=8 as it was found by Chi square test (p-value<0.001), Table (2).

A statistically significant association was found between death and brainstem haemorrhages with p-value =0.0047. We found (80.9%) of patients had a history of hypertension and (34.6%) of them died. Approximately 20 % were not hypertensive and 2.9% of them died. So, statistically significant association (p-value =0.022) was present between hypertension and death, with a higher percentage of deaths among hypertensive patients, Table (2).

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Table (2): Outcome of the study group.

Variable		Died		Alive		P-value
		No.	%	No.	%	
Sex	Male	23	16.9	55	40.4	0.149
	Female	24	17.6	34	25	
Site	Basal nuclei	15	23.1	50	76.9	
	Lobar	10	41.7	14	58.3	
	Thalamus	10	45.5	12	54.5	0.0047
	Cerebellum	4	26.7	11	73.3	
	Brainstem	8	80	2	20	
Hypertension	Yes	43	31.6	67	49.3	0.022
	No	4	2.9	22	16.2	
Midline shift	Yes	45	33.3	34	25.2	<0.001
	No	2	1.5	54	40.0	
Intra-Ventricular extension	Yes	37	27.2	22	16.2	<0.001
	No	10	7.4	67	49.3	
Size	Small	1	0.7	21	1	
	Median	14	10.3	44	14	<0.001
	Large	32	23.5	24	32	
GCS	GCS≤8	24	17.7	10	7.4	<0.001
	GCS>8	23	16.9	79	58.8	
RBS	RBS≥140	32	23.5	31	22.8	<0.001
	RBS<140	15		58	42.7	

The risk factor frequencies are shown in, Table (3).

Table (3): Risk factors studied for the primary (ICH).

Risk factors		No.	%
Hypertension	Yes	110	80.90
	No	26	19.10
Diabetes Mellitus	Yes	43	31.60
	No	93	68.40
Ischaemic heart disease	Yes	36	26.50
	No	100	73.50
Smoking	Non-smoker	82	60.30
	Current smoker	18	13.20
	Ex-smoker	36	26.50

Most haemorrhages were present in the basal nuclei of the brain (47.8%) followed by lobar haemorrhage (17.7%), thalamus (16.2), cerebellar (11%) and brainstem haemorrhage (7.4%) as it is shown in Table (4).

Table (4): Radiological findings of the ICH cases of the study:

Radiological finding		No.	%
Site	Basal nuclei	65	47.8%
	Lobar	24	17.7%
	Thalamus	22	16.2%
	Cerebellum	15	11%
	Brainstem	10	7.4%
Size	Small	22	16.2%
	Median	58	42.6%
	Large	56	41.2%
Midline shift	Yes	79	58.5%
	No	56	41.5%
Intra-ventricular extension	Yes	59	43.4%
	No	77	56.6%

Moreover, increasing age and death were associated statistically significantly, p-value=0.009.

Means of age of dying patients and alive patients were compared by using sample T-test and they were (66.66) years and (56) years respectively and the difference was statistically highly significant, p-value <0.001, Table (5).

Table (5): Comparison of mean of age (in years) of the dead and alive patients

	Died	N	Mean±SD	P-value
Age	Yes	47	66.66±12.499	<0.001
	No	89	56.16±12.060	

Table (6) shows the outcome of the included patients after 6 month follow up (Modified Ranking scale).

Table (6): Outcome according to Modified Ranking Scales.

	Outcome	No.	%
Disabled	No significant disability	10	7.4%
	Slight disability	12	8.8%
	Moderate disability	21	14.7%
	Moderately severe disability	22	16.2%
	Severe disability	24	17.6%
	Death	47	34.6%

Discussion

Primary ICH is one of the most frequent causes of hospital admission and mortality[5]. The mortality rate of 23-58 % has been reported for primary ICH after 6 months of follow up[3]. The present study, which lasted 15 months, included 136 patients with ICH which were admitted to hospitals. Our study goes with the worldwide stroke epidemiologic studies. Researches revealed that stroke fatality varies largely according to the location and period of the study; the case fatality rate was 25-30% in high income countries, while it was 30-48% in low to middle income countries[9, 10]. The mortality rate, which was 34.6% after 6 months of follow up, which is comparable to several reported mortality rates in other several studies4, 5,7,11. It is difficult to distinguish an ICH from an ischemic stroke clinically, but, nausea, vomiting and disturbed consciousness should raise the possibility of a hemorrhagic event more than ischemic one[12].

In the present study, 76.5% of patients had disturbed con-

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sciousness which may be attributable to its hemorrhagic aetiology. Moreover, headache is also in favor of haemorrhage rather than schema which were present in about 52.9% of cases in the present study which all were hemorrhagic in etiology[12-15].

Headache is a feature of haemorrhage because of traction on meningeal pain fibres, raised intracranial pressure, or presence of blood in the cerebro-spinal fluid[9, 15].

In present study results, the risk of seizure in patients with acute ICH (5.1% on presentation) is comparable to some literatures[16-23] (4.2-29%). The commonest site of involvement was the basal nuclei in the present study, which was also shown by Mansooreh et al[5], while in Bakhshayesh et al study[11] the commonest site of involvement was the thalamus. Age is an important risk factor for ICH; the overall odds of suffering an ICH are highest at and after the age of 85 according to Fang MC, et al[19].Increasing age is of poorer prognostic outcome which was also reported by Mansur et al[5].Gender type had no predictive significance in the present study as it was shown by other studies[1-3].

Regarding the site of hematoma, in the present study, there was a significant association between brainstem involvement and mortality and this evidence was supported by some other investigators [5]. There was a highly significant association of midline shift, intraventricular extension, size of the hematoma, GCS less than 8 by 6 months mortality, which was also supported by other investigators[4, 5,7,11]. There was a significant association between hypertension and mortality, in contrast to Qureshi et al[3] which did not regard the presence of history of hypertension as being of prognostic significance. The hypertension could be regarded as the most common, attributable risk factor; it accelerates aging-related wear and tear of cerebral arteries at branch points[21].In the present study history of hypertension was present in 80.9% of the included patients, which could be regarded as the most important risk factor this was also reported by the other studies[22-24]. RBS of more than 140 mg/dl on admission was associated with mortality, which could be regarded as of prognostic significance as there is supported evidence of association of hyperglycemia and bad outcome in other literature [2, 25, 26].

Conclusions

This study showed that clinical presentation, risk factors, outcome and prognostic factors of patients with primary ICH in our location (Erbil city) is similar to the same descriptions in the surrounding and other locations in the world, so it adds to previous studies the extension of generalizability of the results.

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