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Assessment of Acute Complications and Quality of Life in Patients with Ischemic Stroke at Shar Teaching Hospital, Sulaimaniyah, Iraq

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Abstract

Objective: To assess the acute complications and QoL of patients with ischemic stroke at a hospital.

Methods: A descriptive cross-sectional design was used to recruit 131 patients with ischemic stroke at the Shar Hospital in Sulaimaniyah City, Iraq. The non-probability purposive sampling technique was performed at the Neurology Unit. Information was obtained through direct interviews. The questionnaire consists of patients' characteristics, acute complications, and QoL.

Results: Most patients were aged 60-69 years old (67.25%), males (53.4%), married (90.8%), had no formal education (66.4%), housewives (36.6%), from urban areas (79.4%), had no previous transient ischemic attack (TIA) (76.3%), had two comorbidities (35.1%), had chest infection (61.8%), UTI (62.6%), urinary retention (59.5%), shoulder pain (63.4%), fever (67.2%), had 7-8 complications (25.2%), had poor QoL for energy dimension (61.8%), family role (57.3%), language (58%), mobility (58.8%), mood (60.3%), self-care (70.2%), vision (73.3%). However, most patients had good QoL for personality (52.7%), social role (64.9%), thinking (60.3%), upper extremity function (50.4%), and work/productivity (55%). Additionally, most patients (66.4%) had poor overall QoL and only 33.6% had good overall QoL. A significant association ($P \leq 0.05$) was found between participants' QoL and each of the complication numbers, age, residency, TIA and attack numbers.

Conclusions: Most ischemic stroke patients had poor overall QoL and poor QoL with vision, self-care, energy, and mood.

Keywords: Acute complications, physical function, ischemic stroke

Introduction

A stroke is a neurological deficit caused by an acute focal injury of the central nervous system (CNS) due to cerebral infarction or intracerebral hemorrhage.[1] The American Stroke Association updated definitions for cerebral infarction as cell death attributable to ischemia, based on pathological, imaging, and clinical evidence, and intracerebral hemorrhage as a focal collection of blood within the brain parenchyma or ventricular system that is not caused by trauma.[2] The ischemic stroke accounts for approximately 80% of all strokes.[3]

Stroke is the second leading cause of death in the world, affects roughly 13.7 million people, and kills around 5.5 million annually.[4] Approximately 87% of strokes are ischemic infarctions, which increased substantially from 1990 to 2020 and are attributed to decreased mortality and improved clinical interventions. Primary (first-time) hemorrhages comprise the majority of strokes, with secondary (second-time) hemorrhages constituting an estimated 10–25%.[5] The incidence of stroke doubled in low- and middle-income countries over 1990–2016 but declined by 42% in high-income countries over the same period. According to the Global Burden of Disease Study, although the prevalence of stroke has decreased, the age of those affected, their sex, and their geographic location indicate that the burden of stroke has increased over time.[6]

High blood pressure is the most common risk factor for stroke. High cholesterol, diabetes mellitus, heart disease, irregular heartbeat (atrial), and clotting disorders are other risk factors for stroke.[7] The most common complications of stroke are brain edema, swelling of the brain, pneumonia,[8] seizures and convulsions, especially in those with severe stroke.[9] Therefore, it is necessary to systematically look for complications during patient care and rounds; otherwise, severe complications may be overlooked.[10]

A common consequence of impaired motor function is a decreased walking ability.[11] Circuit training in a group is a model where task-specific exercises and activities are performed intensively. The focus was on repetitive task-specific training in everyday motor skills. Circuit training has been shown to improve walking distance and speed, with no increase in the level of spasticity.[12]

Psychological distress after a stroke is common. It has been suggested that the stroke experience can be regarded as a psychological transition as a result of its sudden onset and the potential loss of physical functioning, which impacts the individual's social role, requiring adjustment to a new definition of self.[13] Post-stroke depression occurs in more than 50% of patients, and disorders of mood and cognition have been associated with poor rehabilitation outcomes and reduced participation.[14] Thus, this study was designed to determine the acute complications and QoL among patients with ischemic stroke.

Materials and Methods

This descriptive cross-sectional study was conducted on 131 ischemic stroke patients from 15 June 2022 to 15 December 2022 at the Neurology Unit, Shar Teaching Hospital, Sulaimaniyah, Iraq.

Inclusion Criteria

Ischemic stroke patients aged ≥18 years old, regardless of gender, ethnicity or nationality.

Exclusion Criteria

Unconscious patients.

Data Collection and Study Instruments

Direct interviews collected data through a questionnaire that consisted of three parts. The first part included patient sociodemographic data such as age, sex, marital status, level of education, residential area, and occupation. Clinical

characteristics also included such as transient ischemic attack (TIA), previous stroke attacks, and comorbidities. The second part included complications faced by the patient and consisted of 13 questions. The third part included patient QoL data comprising 12 dimensions and 49 questions. The scores were converted into percentages. A score of <60 considered poor QoL, and ≥60 considered good QoL.

Statistical Analysis

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS, IBM, Chicago, USA, version 25). Descriptive analysis was used to identify patient characteristics (sociodemographic characteristics, clinical characteristics, complications, and QoL). Correlation confidence was used to determine the correlation among QoL dimension scores. The Chi-square test detected associations between QoL and the number of acute complications, QoL, and patient characteristics.

Results

Most patients aged 60–69 years old (67.25%), males (53.4%), married (90.8%), had no formal education (66.4%), housewives (36.6%), and from urban areas (79.4%) (Table 1). Additionally, most respondents had no previous TIA (76.3%) and had two comorbidities (35.1%), which were HTN and DM (Table 2). Also, most participants had chest infection (61.8%), UTI (62.6%), urinary retention (59.5%), shoulder pain (63.4%), and fever (67.2%), while least had constipation (43.5%), aspiration pneumonia (23.7%), seizures (16.8%), congestive heart failure (13.7%), falls (41.2%), pressure sores (18.3%), and increased intracranial pressure (22.1%) (Table 3).

Table 1. **Distribution of participants' sociodemographic characteristics**

Sociodemographic characteristic		Frequency	Percentage
Age (Years)	40–59	30	22.9
	60–69	88	67.2
	≥ 70	13	9.9
Gender	Female	61	46.6
	Male	70	53.4
Marital status	Married	119	90.8
	Widows/Divorced	12	9.2
Levels of education	No formal education	87	66.4
	Primary	12	9.2
	Secondary	19	14.5
	Institute/University	13	9.9
Residency	Urban	104	79.4
	Rural	27	20.6
Occupation	Paid employee	19	14.5
	Self-employee	37	28.2
	Housewife	48	36.6
	Jobless/Retired	27	20.6
Total		**131**	**100**

Table 2. **Distribution of participants' clinical characteristics**

Clinical characteristic		Frequency	Percentage
Previous TIA/ Stroke attack	No	100	76.3
	1 Time	29	22.1
	≥ 2 Times	2	1.5
Numbers of comorbidities	No	38	29.0
	One	34	26.0
	Two	46	35.1
	≥ Three	13	9.9
Type of comorbidities	No	38	29.0
	HT	27	20.6
	DM	7	5.4
	HT & DM	46	35.1
	HT, DM & other comorbidity	13	9.9
Total		**131**	**100**

DM: Diabetes mellitus, HT: Hypertension, TIA: Transient ischemic attack.

Moreover, most patients had 7–8 complications (25.2%), followed by 3–4 complications (22.9%), then ≥ nine complications (16%), 5–6 complications (12.2%), and 1–2 complications (9.9%), while only 13.7% had no complications (Figure 1). Furthermore, most patients had poor QoL for energy dimension (61.8%), family role (57.3%), language (58%), mobility (58.8%), mood (60.3%), self-care (70.2%), vision (73.3%). However, most patients had good QoL for personality (52.7%), social role (64.9%), thinking (60.3%), upper extremity function (50.4%), and work/productivity (55%) (Table 4). Simultaneously, most patients (66.4%) had poor overall QoL, and only 33.6% had good overall QoL (Figure 2).

A strong correlation was found between the energy and each of the family roles, language, mobility, mood, personality, self-care, social role, upper extremity function and work. Also, a strong correlation was found between family roles and language, mobility, mood, self-care, social role, upper extremity function, vision and work. Similarly, a strong correlation was found between language and mobility, mood, personality, self-care, social role, upper extremity function, vision and work. Additionally, there was a strong correlation between mobility and mood, personality, self-care, social role, upper extremity function, vision and work. A strong correlation was found between mood and personality, self-care, social role, upper extremity function and work. A strong correlation was found between personality and self-care, social role, thinking, upper extremity function and work. A strong correlation was found between self-care and social role, upper extremity function, vision and work. A solid, strong correlation was found between social roles, thinking, upper extremity function, and work. A strong correlation was found between thinking and work. A strong correlation was found between upper extremity function and each of vision and work, and finally, a strong correlation was found between vision and work. The correlation between energy and thinking/vision was moderate. The correlation between family role and each of personality/thinking was moderate. The correlation between language and thinking was moderate. The correlation

Table 3. **Distribution of complication's occurrence among patients**

Type of complications		Frequency	Percentage
Chest Infection	No	50	38.2
	Yes	81	61.8
Constipation	No	74	56.5
	Yes	57	43.5
Aspiration pneumonia	No	100	76.3
	Yes	31	23.7
Urinary tract infection	No	49	37.4
	Yes	82	62.6
Urinary retention	No	53	40.5
	Yes	78	59.5
Seizure	No	109	83.2
	Yes	22	16.8
Congestive heart failure	No	113	86.3
	Yes	18	13.7
Extremities (Shoulder) pain	No	48	36.6
	Yes	83	63.4
Fever	No	43	32.8
	Yes	88	67.2
Fall	No	77	58.8
	Yes	54	41.2
Pressure sores	No	107	81.7
	Yes	24	18.3
Increased intracranial pressure	No	102	77.9
	Yes	29	22.1
Total		**131**	**100**

Table 4. **Distribution of quality of life's occurrence among patients**

Dimensions of QoL		Frequency	Percentage
Energy	Poor (< 60)	81	61.8
	Good (≥ 60)	50	38.2
Family role	Poor (< 60)	75	57.3
	Good (≥ 60)	56	42.7
Language	Poor (< 60)	55	42.0
	Good (≥ 60)	76	58.0
Mobility	Poor (< 60)	77	58.8
	Good (≥ 60)	54	41.2
Mood	Poor (< 60)	79	60.3
	Good (≥ 60)	52	39.7
Personality	Poor (< 60)	62	47.3
	Good (≥ 60)	69	52.7
Self-Care	Poor (< 60)	92	70.2
	Good (≥ 60)	39	29.8
Social Role	Poor (< 60)	46	35.1
	Good (≥ 60)	85	64.9
Thinking	Poor (< 60)	52	39.7
	Good (≥ 60)	79	60.3
Upper extremity function	Poor (< 60)	65	49.6
	Good (≥ 60)	66	50.4
Vision	Poor (< 60)	96	73.3
	Good (≥ 60)	35	26.7
Work/productivity	Poor (< 60)	59	45.0
	Good (≥ 60)	72	55.0
Total		**131**	**100**

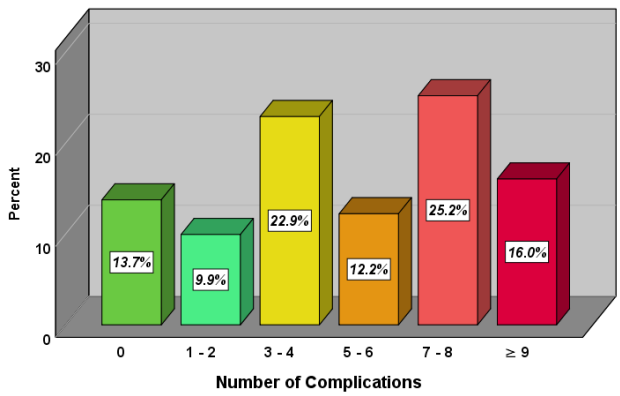

Fig. 1 **Number of complications among patients.**

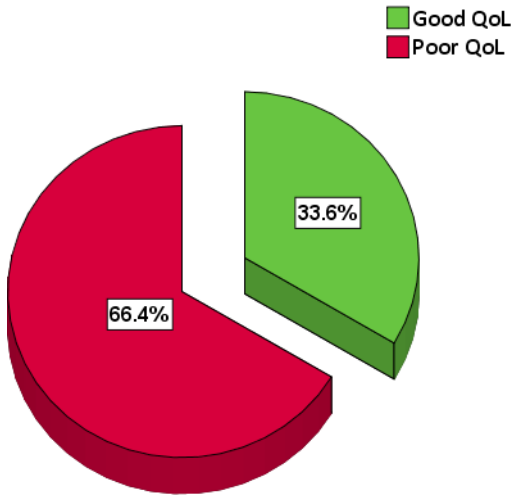

Fig. 2 **Levels of participants' overall quality of life.**

between mobility and thinking was also moderate. The correlation between mood and, thinking, and vision was moderate. The same is true for personality and vision. Similarly, the correlation between self-care and thinking was moderate. The correlation between social role and vision was moderate, similar to that between thinking and the upper extremity functions and vision (Table 5).

A significant association was found between the number of complications and participants' QoL (P = 0.000). All patients with ≥9 complications and most patients with 7–8 complications (93.9%), 5–6 complications (81.2%), and 3–4

Table 5. **Correlation among dimensions of quality of life**

Variables		2	3	4	5	6	7	8	9	10	11	12
1. Energy	r	0.87	0.82	0.83	0.84	0.79	0.84	0.81	0.67	0.81	0.69	0.86
	p	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Family Role	r		0.79	0.85	0.81	0.69	0.87	0.76	0.61	0.84	0.71	0.86
	p		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Language	r			0.81	0.81	0.78	0.76	0.71	0.67	0.76	0.74	0.78
	p			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Mobility	r				0.83	0.74	0.87	0.76	0.66	0.87	0.75	0.91
	p				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Mood	r					0.80	0.81	0.73	0.65	0.81	0.63	0.84
	p					0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Personality	r						0.72	0.86	0.77	0.71	0.67	0.77
	p						0.00	0.00	0.00	0.00	0.00	0.00
7. Self-Care	r							0.80	0.65	0.90	0.78	0.89
	p							0.00	0.00	0.00	0.00	0.00
8. Social Role	r								0.79	0.79	0.69	0.82
	p								0.00	0.00	0.00	0.00
9. Thinking	r									0.64	0.63	0.72
	p									0.00	0.00	0.00
10. Upper Extremity Function	r										0.71	0.89
	p										0.00	0.00
11. Vision	r											0.74
	p											0.00
12. Work/Productivity	r											
	p											

complications (63.3%) had poor QoL. Whereas all patients with no complications and those with 1–2 complications (76.9%) had good QoL (Table 6).

A significant association was observed between patients' QoL, age (P = 0.006), and residency (P = 0.02). Most patients (56.7%) aged 40–59 years had good QoL, while most patients in other age groups (60–79/≥80 years) had poor QoL. No significant correlation was found between QoL and each gender (P = 0.856), marital status (P = 0.509), education level (P = 0.668), and occupation (P = 0.081), and most of them had poor QoL (Table 7).

The association between patients' QoL and clinical characteristics was significant, including TIA (P = 0.001) and number of stroke attacks (P = 0.003); however, the correlation was non-significant for other comorbidities rather than stroke (P = 0.092). Most patients in all three categories had poor QoL (Table 8).

Table 6. **Association between patients' quality of life (QoL) and number of complication**

Number of complications	Good QoL	Poor QoL
	F (%)	F (%)
0	18 (100)	0 (0.00)
1–2	10 (76.9)	3 (23.1)
3–4	11 (36.7)	19 (63.3)
5–6	3 (18.8)	13 (81.2)
7–8	2 (6.1)	31 (93.9)
≥ 9	0 (0.00)	21 (100)
Comparative significant	Chi-square: 70.07	P = 0.000

Discussion

Incidence rates of stroke in Iraq ranged from 196.2 to 218.3 per 100,000 people in 2019, according to Global Burden of Disease 2019 Stroke Collaborators.[15] Thus, this study aimed to determine the acute complications and QoL of patients with ischemic stroke at Shar Teaching Hospital, Sulaimaniyah, Iraq and is considered the first study in this locality.

This study outcome indicated that stroke was directly and strongly correlated to patients' age, male gender, marital status, education level, residency, and occupation. This study also showed that previous TIA and other comorbidities are unrelated to the disease. However, the most common complications after the attack were fever, shoulder pain, UTI, and chest infection. Generally, in patients with CVA, fever can be caused by several factors and frequently indicates underlying illnesses or problems. Stroke can cause neurological damage that interferes with the body's thermoregulatory systems,

Table 7. **Association between patients' quality of life (QoL) and sociodemographic characteristics**

Sociodemographic characteristics		Good QoL	Poor QoL
		F (%)	F (%)
Age (Years)	40–59	17 (56.7)	13 (43.3)
	60–79	25 (28.4)	63 (71.6)
	≥ 80	2 (15.4)	11 (84.6)
Comparative significant		Chi-Square: 10.15	*P* = 0.006*
Gender	Male	24 (34.3)	46 (65.7)
	Female	20 (32.8)	41 (67.2)
Comparative significant		Chi-Square: 0.03	*P* = 0.856
Marital status	Married still live with spouse	41 (34.5)	78 (65.5)
	Widows/Divorced	3 (25)	9 (75)
Comparative significant		Chi-Square: 0.43	*P* = 0.509
Levels of Education	No formal education	27 (31)	60 (69)
	Primary	5 (41.7)	7 (58.3)
	Secondary	6 (31.6)	13 (68.4)
	Institute/University	6 (46.2)	7 (53.8)
Comparative Significant		Chi-Square: 1.56	*P* = 0.668
Residential area	Urban	40 (38.5)	64 (61.5)
	Rural	4 (14.8)	23 (85.2)
Comparative Significant		Chi-Square: 5.37	*P* = 0.02*
Occupation	Paid employee	11 (57.9)	8 (42.1)
	Self-employee	12 (32.4)	25 (67.6)
	Housewife	15 (31.3)	33 (68.8)
	Jobless/retired	6 (22.2)	21 (77.8)
Comparative significant		Chi-square: 6.73	*P* = 0.081

*, Significant association using Chi-square test.

Table 8. **Association between patients' quality of life (QoL) and clinical characteristics**

Clinical characteristics		Good QoL	Poor QoL
		F (%)	F (%)
TIA	No	41 (41)	59 (59)
	Yes	3 (9.7)	28 (90.3)
Comparative significant		Chi-square: 10.40	*P* = 0.001*
	No	41 (41)	59 (59)
Stroke attack	One time	2 (6.9)	27 (93.1)
	≥ Two time	1 (50)	1 (50)
Comparative significant		Chi-square: 11.96	*P* = 0.003*
Other comorbidities	No	18 (43.9)	23 (56.1)
rather than stroke	Yes	26 (28.9)	64 (71.1)
Comparative significant		Chi-square: 2.84	*P* = 0.092

*: Significant association using Chi-square test, TIA: Transit ischemic attack.

leading to body temperature dysregulation. There may be an impact on the hypothalamus, a crucial part of the brain in charge of regulating body temperature, which could lead to the emergence of fever.[16] Furthermore, the presence of pressure ulcers or the use of indwelling catheters may increase the risk of infection, which exacerbates fever in stroke survivors. When a patient has CVA, it is critical for medical professionals to quickly determine and treat the underlying reason

for their fever because chronic hyperthermia can worsen brain damage and make recovery more difficult.[17]

Additionally, the present study showed that most patients (63.4%) had shoulder pain. Patients who have had CVA frequently experience shoulder pain and issues, which are caused by intricate interactions between neurological impairments, changed muscle tone, and decreased mobility. Hemiparesis or hemiplegia, which affects one side of the body, particularly the shoulder area, can occur in stroke patients. This can result in a series of problems that exacerbate shoulder pain. Neurogenic shoulder pain is a common symptom of stroke and is discomfort and inflammation caused by abnormal nerve signals. Muscle imbalances, subluxation (partial dislocation) of the shoulder joint, and aberrant shoulder posture can result from disturbances in normal sensory and motor pathways.[18]

This study also showed that most patients (62.6%) had UTIs. Patients who have had a CVA frequently develop UTIs, caused mainly by a confluence of neurogenic bladder dysfunction and related variables. The communication between the brain and bladder is commonly disrupted by neurological damage sustained during stroke, which results in decreased bladder function. This malfunction can cause incomplete bladder emptying, urine retention, or incontinence, which fosters the growth of germs and the development of UTIs.[18] Urinary issues in stroke survivors are becoming increasingly important, and healthcare professionals are realizing this. The American Heart Association and American Stroke Association (2023) highlighted the importance of routine bladder function monitoring, timely UTI treatment, and interventions to address the underlying issues that contribute to neurogenic bladder dysfunction in patients with CVA. By addressing these characteristics, medical experts hope to improve the overall outcomes of stroke survivors by reducing the occurrence and severity of UTIs.[19]

Our study also showed that most patients suffered from a chest infection, supported by another 61.8% of patients with chest infections. The combination of limited mobility, dysphagia, and impaired lung function increases the risk of respiratory problems following a stroke.[20] Effective prevention and management strategies are essential to mitigate the impact of chest infections on this vulnerable population. Healthcare providers increasingly recognize the importance of early mobilization, pulmonary rehabilitation, and proactive monitoring of respiratory symptoms.[21]

Moreover, this study showed that 70% of the participants had poor QoL with vision dimensions. Patients who have had a CVA frequently experience vision problems, which can have a severe negative effect on the QoL of those recovering from a stroke. Visual impairments are commonly associated with neurological damage that arises after stroke, affecting several brain regions involved in visual information processing. Comprehension and managing these disruptions are essential in all-encompassing stroke care.[22]

The present study also showed that >70% of the participants had poor QoL with self-care dimensions. Patients with CVA often experience a range of physical, cognitive, and psychosocial aftereffects from their stroke, including reduced self-care. Comprehensive stroke therapy is needed to address these issues and consider the reasons behind the decline in self-care.[23] Motor deficits resulting from strokes, such as hemiparesis or hemiplegia, often affect the affected side of the body, limiting the individual's ability to perform activities of daily living. A research study highlighted the prevalence of motor impairments and their association with compromised self-care abilities in stroke survivors.[24]

Moreover, this study showed that most patients had poor QoL in the energy dimension, which agrees with another study that stated that 61.8% of patients had poor QoL in the energy dimension.[25] Increased energy use during movement and activity can be a consequence of stroke-related motor impairments such as hemiparesis or hemiplegia. A similar study highlighted the relationship between motor disability and energy expenditure in stroke survivors. Fatigue results from increased effort needed to move due to muscle weakening, reduced muscle tone, and decreased coordination.[25]

The present study showed that 60.3% had poor QoL with mood dimensions. Patients who have had CVA frequently experience mood impairment, a complicated problem. After a stroke, emotional health is frequently significantly impacted. Studies found similar findings and analyzed the neurological underpinnings of mood shifts following stroke, highlighting the role of brain lesions in mood disorders.[26]

Conclusion

The study showed that a higher number of stroke patients were elderly, males, married, had no formal education, had no previous stroke attack and had two comorbidities. The most common complications in the study sample were fever, shoulder pain, UTI, and chest infection. The majority of the participants had poor overall QoL, and a small proportion had good overall QoL. Most common participants had poor QoL with dimensions (vision, self-care, energy and mood).

Ethical Considerations

The Ethical Committee of the College of Medicine, University of Sulaimani, approved the study protocol (No. 226 on Nov 22, 2021). Written consent was obtained from the participants after the study's objective was explained, and they were informed that they had the right to withdraw from the study when they liked. The investigator established rapport and ensured the confidentiality of the collected data. Formal permission was obtained from the Sulaimani Directorate of Health, Sulaimaniyah, Iraq.

Conflict of Interest

None.

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