THE CORRELATIONS BETWEEN LESION LOCATION AND URINARY DISORDERS WITH QUALITY OF LIFE IN ISCHEMIC STROKE PATIENTS AT HASAN SADIKIN HOSPITAL, BANDUNG

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ABSTRACT

Objective:*This study examines quality of life outcomes in post-ischemic stroke patients with urinary disorders at Hasan Sadikin Hospital Bandung in 2023.****Material &Methods****: This retrospective study analyzed medical registry data from a single center. Quality of life was evaluated using EORTC Core Quality of Life Questionnaire-30 (EORTC QLQ C-30). Descriptive statistics and Chi-Square/Fisher's Exact tests (95% CI, P < 0.005) were used for clinical and demographic data. Multilinear regression tested the relationship between urinary symptom severity and quality of life.* ***Results:*** *The study included 79 ischemic stroke patients in Hasan Sadikin General Hospital. Patients with urinary disorders had an average age of 52 years (SD ± 13.42), mostly within the 50-60 age group. Hypertension was strongly associated with urinary disorders (P <0.001). Quality of life decline was highest in role and physical function within the functional domain, and fatigue and insomnia within the symptom domain. Age showed no significant relationship with patient quality of life (P = 0.847 and P = 0.804), but a statistically significant link existed between IPSS total score and quality of life functional outcomes in stroke-ischemic patients.****Conclusion:*** *A notable link between urinary disorder severity and the functional domain of quality of life was observed. Further investigation into specific quality of life risk factors related to stroke lesion types is recommended.*

Keywords:*Stroke, ischemia, quality of life, urinary disorders.*

ABSTRAK

Tujuan: *Penelitian ini meneliti hasil kualitas hidup pada pasien pasca stroke iskemik dengan gangguan berkemih di RSUP Dr. Hasan Sadikin Bandung pada tahun 2023.* ***Bahan & Cara:*** *Penelitian retrospektif ini menganalisis data rekam medis dari satu pusat. Kualitas hidup dievaluasi dengan menggunakan EORTC Core Quality of Life Questionnaire-30 (EORTC QLQ C-30). Statistik deskriptif dan uji Chi-Square/Fisher's Exact (95% CI, P <0.005) digunakan untuk data klinis dan demografis. Regresi multilinear menguji hubungan antara tingkat keparahan gejala saluran kemih dan kualitas hidup.* ***Hasil:*** *Penelitian ini melibatkan 79 pasien stroke iskemik di Rumah Sakit Umum Pusat Hasan Sadikin. Pasien dengan gangguan berkemih memiliki usia rata-rata 52 tahun (SD ± 13.42), sebagian besar berada pada kelompok usia 50-60 tahun. Hipertensi berhubungan kuat dengan gangguan berkemih (P <0.001). Penurunan kualitas hidup paling tinggi terjadi pada peran dan fungsi fisik dalam domain fungsional, serta kelelahan dan insomnia dalam domain gejala. Usia tidak menunjukkan hubungan yang signifikan dengan kualitas hidup pasien (P = 0,847 dan P = 0,804), tetapi ada hubungan yang signifikan secara statistik antara skor total IPSS dan kualitas hidup fungsional pada pasien stroke-iskemik.* ***Simpulan:*** *Terdapat hubungan yang signifikan antara tingkat keparahan gangguan kemih dan domain fungsional kualitas hidup. Penyelidikan lebih lanjut mengenai faktor risiko kualitas hidup yang spesifik terkait dengan jenis lesi stroke direkomendasikan.*

Kata kunci: *Stroke, iskemia, kualitas hidup, gangguan berkemih.*

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INTRODUCTION

Cerebrovascular disease is one of the major health problems affecting life expectancy worldwide.[1] Stroke is the leading cause of long-term disability, the second leading cause of death after ischemic heart disease, and the 3rd leading cause of disability in the world.[2] In Indonesia, WHO reported stroke as the first cause of death killing 21.2% or 328,500 people in 2012.[3]

This stroke condition causes neurological deficits and disability in patients that interfere with daily activities. The prevalence of disability due to stroke is estimated at 33-460 per 100.000 population.[4] Epidemiological studies prove that approximately 5.5 million people worldwide die each year due to stroke with estimates that the global prevalence of stroke will gradually increase.[5] The outcome of stroke often affects all aspects of an individual's life. Motor function disability is not the only impairment caused by stroke. Beyond that, reduced social contact, lower self-esteem, and depression after stroke, are also contributing factors leading to decreased quality of life.[6-7] Patients with stroke carry physical, psychological, social and economic burdens, and the health-related quality of life (QOL) of patients is low.[8]

Measuring quality of life is the best way to assess the efficacy of interventions such as medical stroke rehabilitation.[9] QOL of post-stroke patients can be assessed from the patients themselves through structured interviews or questionnaires. This measure is useful in understanding the patient's reaction to the disease and in monitoring the effectiveness of health care interventions.[10] One of the widely used tools to assess the quality of life of stroke patients is the EORTC QLQ-C30. This questionnaire consists of 30 questions and includes physical functional (PF), role (RF), emotional (EF), cognitive (CF) and social function (SF) scales.[11]

As the incidence and prevalence of ischemic stroke continues to grow, it is important for healthcare professionals to work collaboratively to explain to patients and families the consequences of the disease and treatments to maintain HRQoL. Knowledge of potential risks can help patients and their families make informed decisions about their disease, so research related to the level of ischemic stroke quality of life (HRQoL) compared to micturition disorders in patients with ischemic stroke. The purpose of this study was to determine the type of micturition disorder based on the type of ischemic stroke lesion location found and the relationship between lesion location and micturition disorder with quality of life in patients with ischemic stroke at Hasan Sadikin General Hospital Bandung.

MATERIAL&METHODS

This study is a descriptive study with a cross-sectional method using a questionnaire at Hasan Sadikin Hospital Bandung. The research subjects were ischemic stroke patients treated at Hasan Sadikin Hospital Bandung in 2023 who met the inclusion and exclusion criteria. The inclusion criteria in this study were patients with ischemic stroke who were in the inpatient room or emergency room of Hasan Sadikin Hospital Bandung in 2023.

Exclusion criteria in this study were incomplete and missing medical record data, patients who did not agree and did not sign the inform consent sheet, patients who had urinary disorders before uncontrolled ischemic stroke. The study was conducted at Hasan Sadikin Hospital, Jalan Pasteur No. 38 Bandung. The study was conducted after obtaining approval from the Research Ethics Committee and permitted by the Director of Hasan Sadikin Hospital Bandung until data collection and processing were completed.

The variables assessed in this study were age, gender, education, occupation, risk factors, duration of ischemic stroke diagnosis, type of ischemic stroke, location of ischemic stroke lesion, micturition disorder, and quality of life. Quality of life variables were measured based on the 30-point EORTC Quality of Life Questionnaire (EORTC QLQ C-30) and the International Physical Activity Questionnaire (IPAC).

RESULTS

A registry review of medical records of patients with ischemic stroke at Dr. Hasan Sadikin Hospital in 2023, based on inclusion and exclusion criteria, resulted in a total of 79 patients. Of the total 79 patients, the majority of ischemic stroke patients were found to have no micturition disorders (n=50 vs n=29). Patients with micturition disorders were predominantly from the age group of 50 - 60 years. Patients aged less than 40 years predominantly had less urinary disturbances as a post-stroke complication than patients in other age groups (Table 1). In addition, based on the statistical analysis, there was no significant difference in the incidence of urinary disorders between male and female subjects ($P = 1.000$).

Ischemic stroke patients without the complication of micturition had a significant difference in etiology pattern from the group of patients with micturition ($P < 0.042$). The majority of patients without urinary disorders had stroke etiologies of undetermined etiology and stroke due to cardioembolic incidents (Table 1). A similar pattern was coherent to the significant risk factors found between the two groups of subjects. Patients with micturition disorders predominantly had no risk

factors related to hypertension, diabetes, or dyslipidemia (40.5%) than subjects with micturition disorders (8.9%).

The majority of ischemic stroke patients in this study had moderate micturition disorders (69%). This result is coherent with the mean IPSS score found in the population, which was 10.17 (IPSS score 8-19 as moderate severity of micturition) (Table 2).

In the quality of life analysis using the EORTC QLQ-C30 instrument, the most significant impacts on the symptom domains perceived by ischemic stroke patients with micturition disorders were fatigue, insomnia, and financial constraints, respectively (Table 3).

In both functional and symptomatic domains, the quality of life of ischemic stroke patients with micturition disorders in this study had

Table 1. Clinical and Demographic Profile of Ischemic Stroke Patients with or without Urinary Disorders at Hasan Sadikin Hospital in 2023.

Variable	Ischemic Stroke		p-value
	Without Micturition Disorders (n = 50)	With Micturition Disorders (n = 29)	
Age	51.26 ± 16.16 (20 – 80)	52.52 ± 13.42 (22 – 77)	
< 40 years	15 (19%)	5 (6.3%)	
40 – 50 years	5 (6.3%)	4 (5.1%)	0.313†
50 – 60 years	15 (19%)	15 (19%)	
60 – 70 years	10 (12.7%)	3 (3.8%)	
70 – 80 years	5 (6.3%)	2 (2.5%)	
Sex			
Male	22 (27.8%)	13 (16.5%)	1.000‡
Female	28 (35.4%)	16 (20.3%)	
Education Level			
No school	3 (3.8%)	1 (1.3%)	
Primary school	10 (12.7%)	4 (5.1%)	0.833†
Junior high school	4 (5.1%)	1 (1.3%)	
Senior high school	20 (25.3%)	13 (16.5%)	
Bachelors	13 (16.5%)	10 (12.7%)	
Pekerjaan			
Housemaid	6 (7.6%)	10 (12.7%)	
Labor	8 (10.1%)	1 (1.3%)	
Student	1 (1.3%)	1 (1.3%)	0.097†
Civil servant	7 (8.9%)	3 (3.8%)	
Employee	12 (15.2%)	7 (8.9%)	
Seller	9 (11.4%)	2 (2.5%)	
Unemployed	7 (8.9%)	5 (6.3%)	
Risk factors			
Hypertension	9 (11.4%)	14 (17.7%)	
Hypertension + Cholesterol	1 (1.3%)	5 (6.3%)	
Hypertension + DM	1 (1.3%)	0 (0%)	0.001†
Cholesterol	6 (7.6%)	0 (0%)	
Cholesterol + DM	1 (1.3%)	2 (2.5%)	
Autoimunne	0 (0%)	1 (1.3%)	
No remarks	32 (40.5%)	7 (8.9%)	
Type of Stroke			
Cardioembolic	14 (17.3%)	4 (5.1%)	
Small-vessel Occlusion	9 (11.4%)	1 (1.3%)	0.042†
Other Determined Etiology	5 (6.3%)	2 (2.5%)	
Undetermined Etiology	22 (27.8%)	22 (27.8%)	

†Fisher's Exact test ‡Chi-Square test

no significant association with increasing age. However, a significant association of decreased quality of life in the functional domain was found with an increase in IPSS score (Table 4).

Table 2. Characteristics of Ischemic Stroke Patients with Urinary Disorders in the Population

Variable	Ischemic Stroke with Urinary Disorders (n = 29)
IPSS score	10.17 ± 4.66
Interval to Onset (years)	2.2 ± 1.6
Degree of micturition disorder	
Mild	8 (27.6%)
Moderate	20 (69%)
Severe	1 (3.4%)

Table 3. Quality of Life based on EORTC QLQ C-30 in Ischemic Stroke Patients with Urinary Disorders.

Variabel	Ischemic Stroke with Urinary Disorders (n = 29)
Fungsional Scale	
Physical Function	79.99 ± 18.60
Role Function	81.03 ± 22.14
Emotional Function	83.62 ± 18.15
Cognitive Function	90.22 ± 15.75
Social Function	85.05 ± 19.07
Mean Function	83.98 ± 14.89
Symptom Scale	
Fatigue	21.22 ± 24.74
Nausea-vomit	6.32 ± 8.23
Pain	9.77 ± 17.54
Dyspnea	1.13 ± 6.18
Insomnia	11.49 ± 25.62
Decrease of Appetite	4.59 ± 11.69
Constipation	7.14 ± 22.87
Diarrhea	2.29 ± 12.38
Financial issues	10.34 ± 15.69
Mean	8.25 ± 10.95

Mean ± SD

The location of the brain that underwent ischemic stroke was shown to have significance for the decrease in quality of life in patients, specifically in the post-stroke functional domain. Patients with lesion location in the cortex area had lower functional domains than patients with stroke lesion location in the subcortex area (P = 0.034).

Table 5. Analysis of Quality of Life due to Urinary Disorders based on Ischemic Stroke Lesion Location.

Location of Lesion	EORCTS-QLQ 30 score	p-value
Functional Domain		
Subcortical	88.76 ± 4.12	0.034
Cortical	79.51 ± 2.06	
Symptom Domain		
Subcortical	10.65 ± 1.45	0.052
Cortical	9.28 ± 0.89	

Mann-Whitney test

DISCUSSION

Ischemic stroke accounts for at least 60% of total stroke cases, and is one of the 10 leading causes of death worldwide.[12] In Indonesia, per the Riskesdas report in 2018, it is known that there are at least 10 thousand Indonesian stroke cases, with an annual incidence ranging from 4 - 14 cases per 1000 population.[13] The increase in incidence trends globally is followed by an increase in fatality rates by 25% in developing countries, including Indonesia, compared to stroke fatality rates in developed countries.[14]

As a multi-factorial disease, stroke has a number of risk factors. One of the non-modifiable risk factors, age, is associated with a dramatically increased risk of stroke as it increases. Based on a systematic review study by Cui et al. in 2019, it is known that ischemic stroke is more common in

Table 4. Analysis of Clinical Characteristics of Patients with Urinary Disorders with Quality of Life Outcomes based on EORTC QLQ C-30.

Variable	EORCTS-QLQ 30 score	Unstandardized Regression (95% CI)	p-value
Functional Domain			
Age (years)	83.98 ± 2.05	B = -0.042 (-0.487 – 0.403)	0.847
IPSS total score		B = 0.437 (-0.846 – 1.719)	0.490
Symptom Domain			
Age (years)	8.25 ± 0.75	B = -0.40 (-0.370 – 0.289)	0.804
IPSS total score		B = 0.127 (-0.823 – 1.077)	0.786

Multilinear Regression test

people over 60 years old, and less common in people under 35 years old.12 Although the incidence of ischemic stroke in young individuals (<50 years old) is relatively lower than in individuals over 50 years old, in the last two decades there has been an increasing trend of at least 5-10%.[15]

Urinary incontinence as one of the neurological complications after ischemic stroke has been demonstrated in at least 30-70% of the total acute post-stroke ischemic complications experienced by patients.[16] Experimental studies in mice conducted by Liang et al. showed that post-stroke urinary incontinence may be caused by damage to the micturition center in the frontal lobe.[17]

Urinary disorders in post-stroke patients not only affect the function of the bladder organ in the process of micturition, but also the patient's quality of life in general. Micturition disorders were independently found to have a strong association with decreased quality of life in post-stroke patients ($P < 0.0001$).[18] Based on a study by Ozden et al., patients with micturition disorders have poorer proprioception sensory abilities and static balance, thus affecting physical function, especially functions that require lower extremity muscle strength.[19] This explains the tendency of decreased physical function as the most significant domain affected in the quality of life of post-stroke ischemic patients with micturition disorders.

Within the symptom domain, post-stroke-ischemic patients in this study population experienced the highest impact on the scale of fatigue experienced in daily activities. It was similarly demonstrated by Feigin et al. that there is a strong association between the prevalence of fatigue in patients after 6 months of ischemic stroke.[20]

Research on the location of stroke lesions and their impact on the quality of life of post-stroke ischemic patients with micturition disorders has not been widely demonstrated in the last 20 years. This is due to the lack of lesion identification due to the limitations of common diagnostic modalities. However, in a study by Lorenzo et al. urinary incontinence in post-stroke patients was described as having a causative tendency, namely the extent of the lesion involved, rather than the location of the lesion itself.[21]

Decreased quality of life in the functional domain in patients with stroke lesions in the cortical area is thought to be due to the disruption of advanced complex functions possessed by the cerebral cortex, such as cognitive, executive, motor, audio-visual, spatial, and consciousness functions. Meanwhile, decreased quality of life in the symptom domain in patients with stroke lesions in the subcortical area is assumed to result from disruptions in the structures of the limbic system, brainstem, or cerebellum.

CONCLUSION

Ischemic stroke causes damage to several physiological functions, one of which is the function of micturition. Clinical variations of post-stroke micturition disorders, especially ischemic stroke, depend on the location and extension of the lesion involved. Stroke patients with lesions in the cortex area tend to have decreased quality of life in the functional domain, while stroke patients with lesions in the cortex area tend to have decreased quality of life in the symptom domain. Further studies with multicenter scale and broader information are needed to fully explore the factors involved in the decreased quality of life of patients with post-stroke ischemic micturition disorder.

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