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Pain Type and Quality of Life in Cervicogenic Headache Patients

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ABSTRACT

Introduction: Cervicogenic headache is classified as a secondary headache under the International Classification of Headache Disorders, third edition (ICHD-3). Significant neuropathic and nociceptive pain components are believed to be present in this condition, which eventually lowers quality of life by causing problems like anxiety, depression, and sleep disruptions. **Objective:** This study aimed to correlate pain types with quality of life in those suffering from cervicogenic headaches. **Methods:** A cross-sectional observational study was conducted at the Neurology Outpatient Clinic of Dr. Soetomo General Academic Hospital in Surabaya from June to August 2020. Quality of life and pain types were evaluated using the painDETECT and SF-36 questionnaires. A painDETECT score of 12 or less indicated nociceptive pain, but a score of more than 12 indicated neuropathic pain. An SF-36 score below 50 indicated a poor quality of life. **Results:** The data revealed that in the neuropathic pain group, 87% (13 subjects) had a poor quality of life, while 13% (2 subjects) had a good quality of life. In contrast, in the nociceptive pain group, 7% (1 subject) experienced a poor quality of life, whereas 93% (14 subjects) had a good quality of life. The Chi-square test yielded a p-value of < 0.01. **Conclusion:** Patients with cervicogenic headaches and neuropathic pain exhibited a lower quality of life compared to those experiencing nociceptive pain. These findings emphasize the importance of evaluating pain types to support the maintenance of a good quality of life.

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INTRODUCTION

The International Classification of Headache Disorders, third edition (ICHD-3), categorizes cervicogenic headache as a secondary headache disorder.¹ Cervicogenic headaches are among the most disabling headache disorders, leading to significant physical impairment.¹ Around 47% of the global population suffers from headaches, and 15–20% are cervicogenic headaches.^{2,3} The prevalence of cervicogenic headache is estimated to affect 4.1%–21.4% of the population.⁴ Cervicogenic headache is estimated to affect 17.8% of people who suffer from frequent headaches.⁵ One of the biggest challenges is a chronic cervicogenic headache, which rarely receives proper treatment.⁶ This condition can lead to a decrease in the patient's quality of life and also cause more severe physical disturbance compared to other types of headaches.^{6,7}

Cervicogenic headache patients suffer pain that is either neuropathic, nociceptive, or a combination of the two.⁸ Cervicogenic headache-related neuropathic pain is believed to contribute to disabilities such as depression, anxiety, and sleep disturbances, ultimately leading to a reduced quality of life in affected individuals.⁹

This research is highly significant, considering that cervicogenic headache is a relatively prevalent type of headache that often remains underdiagnosed. Moreover, it frequently progresses into a chronic condition, adversely affecting quality of life and posing challenges in its management.

OBJECTIVE

The point of this study was to find out if there was a relationship between the type of pain measured with painDETECT and the quality of life measured by the 36-item SF-36 (Health Survey instrument) in cervicogenic headache patients at the Neurology Outpatient Clinic of Dr. Soetomo General Academic Hospital, Surabaya.

METHODS

Study design and sampling

This research used a cross-sectional observational method and looked at people with cervicogenic headaches who went to the Neurology Outpatient Clinic of Dr. Soetomo General Academic Hospital, Surabaya, between June and August 2020. They had to meet certain criteria in order to be included in the study. The subjects' sampling method was done through consecutive admission until the predetermined

subject size was reached.

The study's inclusion criteria included patients with cervicogenic headaches who were over 18 years old, had a minimum education in junior high school or equivalent, could understand and speak Indonesian, and were willing to participate in the research. The exclusion criteria were patients with psychotic or psychosomatic disorders and fibromyalgia. All subjects who met the inclusion criteria underwent history-taking, pain DETECT, and SF-36 examinations by the researcher and two resident doctors.

Pain type examination, quality of life examination, and potential confounding variable

The 36-item Short Form Health Survey (SF-36) was used to assess quality of life, and the painDETECT questionnaire was used to determine the type of pain type. Poor quality of life was indicated by an SF-36 score below 50, while good quality of life was indicated by a score over 50. Neuropathic pain was indicated by a painDETECT score of more than 12, and nociceptive pain was indicated by a score below 12. The confounding variables include age, gender, personality type, education, and other pain conditions.

Statistical analysis

The Chi-square test was conducted to analyze the relationship between pain type and quality of life in patients with cervicogenic headache. The results were interpreted at a 5% significance level ($\alpha = 0.05$), with $p < 0.05$ rejecting the null hypothesis (H_0) and $p > 0.05$ accepting it. The odds ratio (OR) and confidence interval (CI) were calculated as part of the analysis. All data were processed using the Statistical Package for the Social Sciences (SPSS) version 20.0 (SPSS, Inc., Chicago, Illinois).

RESULTS

This study analyzed 30 subjects, including 16 (53.3%) cervicogenic headache patients with good quality of life (SF-36 > 50) and 14 (47.7%) with poor quality of life (SF-36 < 50). There were 15 (50%) subjects with nociceptive pain and another 15 (50%) with neuropathic pain.

Table 1 presents the baseline characteristics of subjects, which included demographic data such as age and gender. This study's cervicogenic headache patients ranged in age from 20 to 70 years old, with a mean age of 48.83 ± 2.711 years. Male subjects were 6 (20%), while female subjects were 24 (80%).

Table 1. The baseline characteristics of subjects with cervicogenic headache

Variable	Quality of Life		Total	P	OR (CI 95%)
	Poor	Good			
Age					
- ≥ 50 years old	7	9	16	0.732	0.7 (0.18-3.28)
- < 50 years old	7	7	14		
Gender					
- Female	13	11	24	0.1	5.9 (0.59-58.4)
- Male	1	5	6		

According to the research subject data in Table 2, there were 15 cervicogenic headache subjects with suspected nociceptive pain (50%) and 15 cervicogenic headache subjects with suspected neuropathic pain (50%).

Table 3 shows two groups of cervicogenic headache subjects based on their quality of life: 16 (53.3%) with good quality of life and 14 (46.7%) subjects with poor quality of life.

Table 2. The distribution of subjects based on the diagnosis for the type of pain

Suspected Diagnosis	Number of Subjects (n = 30)	%
Neuropathic pain	15	50
Nociceptive pain	15	50

Table 3. Distribution of quality of life for research subjects

Suspected Diagnosis	Number of Subjects (n = 30)	%
Good	16	53.3
Poor	14	46.7

The SF-36 is a 36-item instrument designed to evaluate eight domains of health status. It provides two summary scores: the Physical Component Summary (PCS), which indicates physical quality of life, and the Mental Component Summary (MCS), which measures mental quality of life. The PCS contains physical functioning, physical role, pain, and general health, while the MCS includes vitality, social functioning, emotional role, and mental health. The SF-36 has a score range of 0 to 100, with higher scores indicating a better quality of life.

The mean physical quality of life (PCS) score for neuropathic pain was 41.52 ± 13.61 , and for nociceptive pain, it was 68.38 ± 14.07 . The mean mental quality of life (MCS) score for neuropathic pain was 48.75 ± 17.26 , and for nociceptive pain, it

was 77.74 ± 11.51 . The mean SF-36 quality of life score for neuropathic pain was 44.34 ± 14.51 , and for nociceptive pain, it was 71.66 ± 13.16 . SF-36 scores above 50 are defined as good quality of life, and scores below 50 are interpreted as poor quality of life. (Table 4)

Among those with neuropathic pain, 14 (93.3%) had a poor quality of life, while just one (6.7%) had a good quality. In contrast, among those with nociceptive pain, one subject (6.7%) reported a poor quality of life, while 14 subjects (93.3%) had a good quality of life. The Chi-square test yielded a p-value of < 0.01 . (Table 5)

Table 6 presents data highlighting the characteristics of mental quality of life (MCS) based on pain types. A statistically significant association was found between pain type and mental quality of life, with a p-value of 0.014 and an odds ratio of 16 (95% CI: 1.65–154). This means that persons with neuropathic pain are 16 times more likely to have a poorer physical quality of life than those with nociceptive pain.

Table 4. Distribution of quality of life score based on the type of pain

Quality of life	Neuropathic Pain	Nociceptive Pain
PCS	41.52 ± 13.61	68.38 ± 14.07
MCS	48.75 ± 17.26	77.74 ± 11.51
SF-36	44.34 ± 14.51	71.66 ± 13.16

Table 5. Physical quality of life (PCS) characteristics by the types of pain

	Physical Quality of Life		Total	P
	Poor	Good		
Neuropathic pain	14 (93.3%)	1 (6.7%)	15	< 0.01
Nociceptive pain	1 (6.7%)	14 (93.3%)	15	

Table 6. Mental quality of life (MCS) characteristics by the types of pain

	Mental Quality of Life		Total	P	OR (CI 95%)
	Poor	Good			
Neuropathic pain	8 (88.9%)	7 (33.3%)	15	< 0.01	16 (1.65-154)
Nociceptive pain	1 (11.1%)	14 (66.7%)	15		

Table 7. Quality of life characteristics (SF-36) by the types of pain

	Quality of Life		Total	P
	Poor	Good		
Neuropathic pain	13 (92.8%)	2 (12.5%)	15	< 0.01
Nociceptive pain	1 (7.2%)	14 (87.5%)	15	

The data presented in Table 7 demonstrates a statistically significant relationship between the type of pain experienced in cervicogenic headaches and quality of life, with a p-value < 0.01.

DISCUSSION

This study evaluated quality of life in relation to neuropathic and nociceptive pain in order to find out the relationship between pain types and quality of life in patients with cervicogenic headaches. As individuals age, their physical, social, and mental abilities tend to decline. As people age, they often find themselves less capable of engaging in activities that contribute to fulfilling their quality of life.¹⁰ Older age groups have unique adaptations to pain that are related to mental elements, such as spirituality levels, proficiency, a better understanding of religion, and a better perception of general health, which can protect against a decline in quality of life.^{11,12}

According to the analysis, women face more obstacles when it comes to accessing health care and have higher levels of psychological stress in the form of anxiety and depression.^{13,14} However, it does not rule out the potential that men experience more worry in the fatalism subscale than women.¹⁵ The statistical results of this study indicate that there was no difference in the quality of life between females and males. Research subjects' marital status, personality, family/social support, and optimism may all play a role in this. The majority of the women in this study were housewives. A larger sample size may be required to make the relationship between gender and quality of life statistically and clinically relevant.^{16,17}

In this study, 16 subjects had a good quality of life, while 14 had a poor one. The average PCS score was lower in subjects with neuropathic pain and cervicogenic headaches than in subjects with nociceptive pain (41.52 ± 13.61 vs. 68.38 ± 14.07). In terms of mean MCS value, neuropathic pain is worse than nociceptive pain (48.76 ± 17.26 vs. 79.64 ± 11.51). Bonezzi *et al.* showed that the pathological processes in neuropathic pain happen both peripherally and centrally, impacting the inhibitory function system and disrupting the interaction between somatic and sympathetic nerves. This leads to irreversible damage to numerous nerve cells, resulting in

chronic pain that negatively impacts one's quality of life.^{18,19}

Although the mean value of quality of life for the subjects with nociceptive pain is better than that of those with neuropathic pain, it remains lower than the average value of quality of life in the population. This happens because persistent and uncontrolled pain can have detrimental and damaging effects in almost every aspect of the patient's life. It can cause anxiety and emotional distress, interfere with feelings of security and functional occupation, and hinder the ability to meet the needs of family and vocational roles. A wide-ranging effect on pain, whether nociceptive or neuropathic, will result in a decrease in quality of life.²⁰

It is very important for early management of neuropathic pain associated with a decrease in the physical quality of cervicogenic headache patients. The integration of physical exercise and rehabilitation, together with pharmacotherapy, is effective in reducing the frequency of attacks and the intensity of pain. Given the significant involvement of the musculoskeletal system and its relationship to the cervical spine, early physical exercise and rehabilitation make sense.^{21,22}

The presence of family, psychosocial, and spiritual support significantly influences the mental quality of a patient's life. The educational, spiritual, and cultural backgrounds of the patient and their family also influence treatment and perceptions of disease status.¹¹

The Chi-square test revealed a significant difference in quality of life between the neuropathic and nociceptive pain groups ($p < 0.01$). Based on these data, cervicogenic headache patients' quality of life is significantly correlated with their pain type. The study's hypothesis was confirmed, indicating a correlation between the type of pain experienced by cervicogenic headache patients and their quality of life, as assessed using the SF-36.

The study was the first in Indonesia, especially Surabaya, to examine the relationship between the type of pain in cervicogenic headache as defined by painDETECT and quality of life as determined by the SF-36. The study's limitation lies in its failure to incorporate and analyze personality type, education, and pain in areas other than a heavier head.

CONCLUSION

HFS is an uncommon manifestation of contralateral supratentorial tumors, especially when there is no direct neurovascular contact of the 7th cranial nerve. It is crucial to consider a wide range of potential causes of HFS and to conduct a thorough assessment of the patient's history, physical examination, and radiological findings. This comprehensive approach is essential for accurate diagnosis and effective management, which can help mitigate the risk of a poor prognosis.



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Conflict of Interest

No conflict of interest was declared by the authors.

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Author Contributions

Concept – P.N., N.A.; Design – N.A.; Supervision – M.H.; Resource – N.A.; Materials - P.N., N.A.; Data collection and/or processing – N.A.; Analysis and/or interpretation - P.N., N.A.; Literature search – N.A.; Writing - P.N., N.A.; Critical reviews – P.N, M.H.

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