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**Research Article**

# ORAL HEALTH RELATED QUALITY OF LIFE IN NEUROSURGICAL PATIENTS

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**A R T I C L E I N F O**

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**A B S T R A C T**

**Introduction:** Neurological conditions such as head injury lead to physical weakness, lack of coordination and cognitive problems, thereby making it difficult to maintain good oral hygiene. Post -surgical and post disease impairments can have negative impacts on daily functions and thus affect health related quality of life. Likewise, oral health related is also affected considerably as a result of post neurological deficit, orofacial impairments.
**Aim**: To assess the oral health related quality of life among neurosurgical patients.
**Methods and Materia**l: A questionnaire survey was done to assess the Oral health related quality of life of neurosurgical patients attending the neurosurgical Out Patient Department (OPD) at a tertiary care centre. All Subjects coming to the OPD were recruited according to the selected inclusion/exclusion criteria.
**Results**: Mean OHIP score among males was found to be 27.3 and among females, mean OHIP score was 41.0. A statistically significant difference was seen among all the groups, except for the one with comorbidities. Females had the highest mean OHIP subscale score under psychological disability where as males had highest mean OHIP subscale score under physical disability.
**Conclusion:** Neurosurgical subjects are a very vulnerable class of patients. Impairments appear to be sustained, with spontaneous recovery unlikely to occur. Rehabilitative approaches may have the potential to improve oral health related quality of life following neurosurgical insults.



## INTRODUCTION

Neurosurgical emergencies are among the most prevalent causes of disability and death[1]. Tumors and head injuries are one of the commonest causes of neurological impairments[2]. Epidemiologists and researchers have consistently suggested an association between measures of oral health and various chronic systemic diseases, like patients with neurological deficits[3].

Neurological conditions such as head injury lead to physical weakness, lack of coordination and cognitive problems, thereby making it difficult to maintain good oral hygiene[4]. These diseases, therefore, constitute a considerable challenge in routine oral care[5]. Neurosurgical emergencies are a predominant cause of permanent disability among the elderly. Reduced tongue pressure fails to propel the food bolus into the pharynx. Decreased lip force causes drooling during mastication. Hyposalivation results in a lack of lubrication to the oral mucosa. Abnormal oral sensory function causes choking and aspiration as a result of inaccurate estimation of the food bolus size. Discordant orofacial function leads to low chewing efficiency, limited food choice, and malnutrition[6]. Embarrassment, low self-esteem, and discomfort may also arise. Poor oral care after a neurological deficit can have serious physical, psychological and social consequences and adversely affect quality of life[7]. Dysphagia and loss of sensation affects up to 78% of patients who have recently had a stroke and can cause stasis of saliva and food in the oral cavity[8]. Reduced tongue pressure and altered lateral movements result in increased risk of aspiration as well as causing food to pool in the sulci of the oral cavity resulting in denture problems and stomatitis[9].

There also appears to be a higher than normal pathogenic bacterial and yeast count in the oral cavity in the acute phase of stroke. This combination increases the risk of aspiration pneumonia[10].Oral health is defined as "a state of being free from mouth and facial pain, oral and throatcancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial well-being" [11]. Post-surgical and post disease impairments (motor, perceptual, and cognitive) can have negative impacts on daily functions, and thus affect health-related quality of life (HRQoL). Likewise, oral health-related quality of life (OHRQoL) is also affected considerably as a result of post neurological deficit, orofacial impairments[12].

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Despite its relatively recent emergence over the past few decades, oral health related quality of life (OHRQoL) has important implications for the clinical practice of dentistry and dental research. OHRQoL is an integral part of general health and well-being and is recognized by the WHO as an important segment of the Global Oral Health Program [13] .

Efforts range from the elimination of dental pain to illuminations of aesthetic images using 'attractive' smiles with 'white' teeth. Such efforts are integrated into what isnow referred to as OHRQoL[14]. Further, the opportunity arose to consider how oral health affects aspects of social life, including self-esteem, social interaction, school and job performance, etc. Since Cohen and Jago (1976) first advocated the development of sociodental indicators, efforts have been invested in developing instruments to measure OHRQoL[15]. The subjective evaluation of OHRQoL "reflects people's comfort when eating, sleeping and engaging in social interaction; their self-esteem; and their satisfaction with respect to their oral health" [16]. It is the result of an interaction between and among oral health conditions, social and contextual factors (Locker *et al*., 2005) [17], and the rest of the body (Atchison *et al*., 2006) [18]. So, in order to investigate the OHRQoL among neurosurgical patients, I, ventured into conducting a study on them.

## MATERIAL AND METHODS

A questionnaire survey was done to assess the Oral Health related Quality of Life among neurosurgical patients attending the neurosurgical OPD at a tertiary care centre.

Subjects were recruited according to the following inclusion criteria:

1. All neurosurgical patients who were previously operated for trauma, tumor or stroke were followed up in the OPD, after a minimum of six weeks of discharge from the hospital.
2. Patients with Initial Glasgow Coma Scale value of more than 8.
3. Patients of age between 18-60 yrs.
4. Patients with Mini Mental State exam value of more than 18.
5. Patients who are able to follow one step commands.
6. Patients having at least one tooth and no indwelling feeding tubes.

Written informed consent was taken from the study subjects. All enrolled patients coming to the OPD were made to fill the OHIP-14 questionnaire.

Oral Health Impact Profile -14(OHIP-14) was used, that explores seven dimensions of impact: functional limitation, physical pain, psychological discomfort, physical disability, social disability and handicap. Other variables were included such as age, gender, comorbidity, Glasgow coma scale. The response format of OHIP-14 was as follows: Very often =4; Fairly often =3; Occasionally=2; Hardly ever = 1; Never = 0. The OHIP -14 scale ranged from 0 to 56, with higher scores indicating poorer OHRQoL.

### *Statistical Analysis*

After completing all the questionnaires, the data was analyzed using Statistical Package Of Social Sciences Version 20.0. The results were expressed as difference in OHRQOL index with reference to initial GCS, age, sex, Comorbidities and other suitable demographic variables. The results were analyzed using ANOVA test and p value of less than 0.05 was considered to be statistically significant.

## RESULTS

(Table 1) shows the demographic variables. Regarding comorbidities, 34 subjects had no comorbidity, 39 subjects had Hypertension (HTN), 10 subjects had Diabetes Mellitus (DM), 8 subjects had Coronary Artery Disease (CAD) and 9 subjects had Chronic Liver Disease (CLD) shown in (Table 2)

**Table 1** Distribution of subjects according to gender, age, GCS, Comorbidity and cause of disability

| S.No | | Frequency | Percentage |
|---|---|---|---|
| 1 **Gender** | Male | 87 | 87% |
| Female | | 13 | 13% |
| **2 AGE**<50 | | 64 | 64% |
| >50 | | 36 | 36% |
| **3 GCS**<12 | | 57 | 57% |
| >12 | | 43 | 43% |
| **4 Comorbidity** | Yes | 66 | 66% |
| | No | 34 | 34% |
| **5 Cause of Disability**: | Stroke | 8 | 8% |
| Trauma | | 27 | 27% |
| Tumour | | 65 | 65% |

Table 3 shows the mean OHIP scores. Table 4 shows the mean OHIP subscale scores. Under functional limitation, Mean OHIP subscale scores for males was 5.00 whereas mean OHIP subscale scores for females was 4.00.

**Table 2** Distribution of subjects according to Comorbidity

| Comorbidity | Frequency | Percentage |
|---|---|---|
| CLD | 9 | 9.0 |
| CAD | 8 | 8.0 |
| HTN | 39 | 39.0 |
| DM | 10 | 10.0 |
| NIL | 34 | 34.0 |
| Total | 100 | 100.0 |

**Table 3** Distribution of subjects according to OHIP Scores

| S. No | | N | Mean | Std Deviation | P score |
|---|---|---|---|---|---|
| Gender | M | 87 | 27.3750 | 9.45930 | <0.001 |
| | F | 13 | 41.000 | 5.90839 | |
| Age | <=50 years | 64 | 27.0938 | 9.34985 | <0.001 |
| | >50 years | 36 | 32.4167 | 10.64861 | |
| GCS | <=12 | 57 | 34.1636 | 6.75158 | <0.001 |
| | >12 | 43 | 22.7111 | 10.02411 | |
| Comorbidity | Absent | 34 | 28.0000 | 10.15337 | 0.476 |
| | Present | 66 | 29.5303 | 10.13330 | |
| Cause of disability | Stroke | 8 | 45.0000 | .00000 | <0.001 |
| | Trauma | 27 | 20.5000 | 9.49632 | |
| | Tumor | 65 | 30.4242 | 7.66021 | |

**Table 4** Distribution of subjects according to OHIP subscale scores

| | Sex | N | Mean | Std. Deviation |
|---|---|---|---|---|
| Functional Limitation | M | 87 | 5.0000 | 2.04546 |
| | F | 13 | 4.0000 | .00000 |
| Physical pain | M | 87 | 4.3636 | 2.01250 |
| | F | 13 | 6.3333 | 2.46183 |
| Psychological Discomfort | M | 87 | 3.4318 | 1.22047 |
| | F | 13 | 4.6667 | 2.46183 |
| Physical Disability | M | 87 | 5.0341 | 2.49804 |
| | F | 13 | 6.6667 | .98473 |
| Psychological Disability | M | 87 | 2.9091 | 1.26524 |
| | F | 13 | 7.3333 | .98473 |
| Social Disability | M | 87 | 3.5795 | 2.49929 |
| | F | 13 | 6.0000 | 2.95420 |
| Handicap | M | 87 | 3.0568 | 1.62847 |
| | F | 13 | 6.0000 | 2.95420 |

## DISCUSSION

In the present study, majority of subjects were males (87%). Previous studies also show male preponderance. The preponderance of males is probably due to differential exposure of males and females to road traffic accidents. In another study from India, the ratio of male to females was 6:1.

Majority of the subjects were in the age group of less than 50 years, which was similar to a study by Tao Sun *et al* where also the majority of neurosurgical patients were in the age group of < 50yrs[19]. Neurosurgical emergencies tend to occur more in middle aged patients as stated in a study by Sun T *et al*.

In our study, 57 patients had gcs less than 12, which is quite consistent with the serious nature of the neurosurgical injuries. In the present study, the OHIP- 14 score was higher among the females, as was also seen in a study by Aguilera AB *et al* done in Healthcare District of Colaba in Spain, where the mean score of females was 21.37 as compared to 13.76 among males[20].

Also, the OHIP score was higher in the elderly age group (> 50 years age group) which could be attributed to the higher incidence of edentulousness and neglect of oral hygiene in the elderly. Similar results were seen in a study by Rodakowska E *et al* on elderly patients of Poland where higher OHIP 14 scores were seen among them[21].

Pertaining to the GCS value, subjects with lesser GCS had higher OHIP- 14 scores as was also seen in a study by Lee YL *et al*[22]. This could be attributed to the fact that that subjects with lesser GCS would have poor self-care efficiency. Based on the comorbidities, the OHIP scores were almost comparable between the two sexes with no statistical significance (p value of 0.476).

Regarding the cause of disability, the trauma patients had the least OHIP -14 score of 20.5 whereas the stroke patients had the highest score of 45.0.The results were statistically significant with a p value of <0.001.The results are rightly justified as the stroke patients tend to be more severely affected with higher incidence of bulbar involvement and poor oral health status. Similar findings were seen in a study by Dai R *et al* where there were higher OHIP score among stroke patients[12].

Based on the subscale OHIP score in our study, among females, the highest scores were seen for psychological disability (7.33) followed by physical disability(6.66), physical pain(6.33), social disability and handicap(6.00), psychological discomfort(4.66) and lastly functional limitation(4.00) Among males, the highest score was for physical disability (5.03), followed by functional limitation (5.00), physical pain (4.36), social disability (3.57), psychological discomfort( 3.43), handicap 3.05 and psychological disability (2.90). The results were similar to a study by Lalic M *et al* done on adult patients in Serbia[23]. In our study, the physical disability was the most affected parameter in the subscale OHIP 14 score showing high level of bulbar involvement among the neurosurgical patients.

In the present study, higher OHIP-14 scores were seen in the subjects showing that the neurosurgical patients had a very poor OHRQOL and a high level of oral health care is required during the rehabilitation phase of their recovery.

## CONCLUSION

Neurosurgical subjects are a very vulnerable class of patients. Existing evidence highlights a number of compromised orofacial functions experienced by neurosurgical patients. Such patients are unable to take good care of their oral health. Neurosurgical patients tend to have higher OHIP-14 scores as compared to normal population as is evident in our study. These impairments appear to be sustained, with spontaneous recovery unlikely to occur. While rehabilitative approaches may have the potential to improve orofacial function and quality of life following neurosurgical insults, there is currently a lack of evidence-based interventions available to inform the development of comprehensive rehabilitation protocols

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