Oral health-related quality of life in Iranian patients with spinal cord injury: A case–control study

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ABSTRACT

Introduction: The study aimed to compare the oral health variables, general, and oral health-related quality of life (QoL), depression, and anxiety between spinal cord injury (SCI) patients and healthy controls and also to determine the key factors related to the oral health-related quality of life (OHRQoL) in the SCI patients.

Methods: A total of 203 SCI patients and 203 healthy controls were enrolled. Patients and healthy adults were invited to attend a dental clinic to complete the study measures and undergo oral clinical examinations. OHRQoL was assessed by the 14-item Oral Health Impact Profile (OHIP-14), and the general health-related quality of life (GHRQoL) was evaluated by SF-36. In SCI patients, depression and anxiety were recorded using the Hospital Anxiety and Depression Scale (HADS), while Functional Assessment Measure (FAM) was used to assess dependence and disability. All the subjects were examined for caries which was quantified using the decayed, missing, and filled Teeth (DMFT) index, gingival bleeding index (GI), plaque index, and periodontal status by community periodontal index (CPI).

Results: The analysis of covariance (ANCOVA) revealed significant differences between the two groups in terms of oral health expressed in DMFT, oral hygiene, and periodontal status, controlled for age, gender, family income, and occupational status ($p < 0.001$). Using the hierarchical linear regression analyses, in the final model, which accounted for 18% of the total variance ($F(126.7)$, $p < 0.01$), significant predictors of OHRQoL were irregular tooth brushing ($\beta = 1.23$; 95% CI = 1.06; 1.41), smoking ($\beta = 0.82$; 95% CI = 0.66; 0.97), dry mouth ($\beta = 0.37$; 95% CI = −0.65 to 0.10) functional and motor functioning ($\beta = 0.32$; 95% CI = −0.45 to 0.17), DMFT ($\beta = 0.06$; 95% CI = 0.02; 0.09), CPI ($\beta = 0.22$; 95% CI = 0.04; 0.04), physical component measure of GHRQoL ($\beta = −0.275$; 95% CI = −0.42 to 0.13), lesion level at the lumbar–sacral ($\beta = −0.18$; 95% CI = −0.29 to −0.06) and thoracic level ($\beta = −0.09$; 95% CI = −0.11 to −0.06).

Conclusion: SCI patients had poor oral hygiene practices, greater levels of plaque, gingival bleeding, and caries experience than the healthy controls. In addition, more number of SCI patients had periodontal pockets and dry mouth than the comparative group. SCI patients experienced more depression and anxiety, poor GHRQoL, and OHRQoL than the healthy control group. The factors that influenced OHRQoL in SCI patients were age, toothbrushing frequency, smoking, oral clinical status, depression, physical component of GHRQoL, and level of lesion.

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Introduction

The increasing prevalence of spinal cord injuries (SCI) is evidenced by the data from a recent systematic review reporting an incidence of 8–246 cases/million and 236–1298/million

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inhabitants globally [1]. Traumatic SCI contributes to a major proportion of SCI with the incidence ranging from 3.6 to 195.4 patients per million around the world [2]. The estimated prevalence of SCI in Iran is 348.45 cases per million individuals [3]. In Tehran province, the prevalence of SCI is found to be 296.87 per million based on the data obtained from three organisations that supports SCI patients [3], while another cross-sectional survey from Tehran city reports a point prevalence of 4.4 per 10,000 people in Tehran (i.e., ~440 per million) [4]. The burden of SCI and its aetiology varies between the countries and regions with this condition assumed to be more prevalent in developing than in developed countries [5]. In the developing countries, motor vehicle accidents and falls are the predominant causes for SCI [6] as is the case with Iran where trauma is the etiological factor for more than half of the SCI cases [7].

Mortality rates are high in those with SCI than the able bodied, which might be due to the associated urological, cardiovascular, or pulmonary disorders [8,9]. However, there has been considerable improvement in the survival of these patients in the recent decades owing to the improvements in medical care [8,9]. With the increase in survival, SCI is associated with secondary health conditions such as pressure ulcers, spasticity, upper-extremity pain, and obesity which can impede normal lifestyle and thus affect negatively the quality of life (QoL) [10]. The other psychosocial problems experienced by SCI patients are financial hardship due to unemployment, difficulties with transportation, education, marriage, social relationships, sports and entertainments, depression, sadness, suicidal thoughts, and lack of self-confidence [11]. Therefore, SCI is associated with not only limited function but also psychosocial and socioeconomic sequelae [12].

Most of the patients with SCI perceive a low QoL due to secondary health problems, dependence on others, and limitation in movement [13]. Limited movement and dependence on caregivers hinder the performance of regular general hygiene and also oral hygiene in SCI patients. Firstly, the medications usually prescribed in these patients to treat muscle spasms and neurogenic bladder disorders might lead to xerostomia which in turn leads to increased accumulation of dental plaque and also dental caries [14]. Secondly, these patients might restrain themselves from performing regular oral hygiene as this needs extra efforts and specialised equipment such as arm supports, universal cuffs, or splints [16]; a study by Stiefel et al. reported poor oral hygiene practices in these patients [17]. The research on the oral health status of SCI is scarce and there are no reports from Iran. Further, no studies have evaluated the oral health-related quality of life (OHRQoL) and its predictors in these patients, while extensive data are available on the general health-related quality of life (GHRQoL). This study aims (1) to compare the oral health variables, GHRQoL, OHRQoL, depression, and anxiety between SCI patients and healthy controls and (2) to investigate the key factors related to OHRQoL in SCI patients.

Materials and methods

Patients

In this case–control study, 203 SCI patients and 203 healthy controls were enrolled. The study was conducted in two neurologic centres of Qazvin University of Medical Sciences. SCI patients and healthy controls were recruited consecutively between February and July 2014.

Subjects were included in the patient group if they had SCI for >3 months, were aged ≥18 years, and agreed to participate in the study. Patients were excluded from the study if they were pregnant and severe psychotic, drug, or alcohol abusers or had communication

difficulties and cognitive impairment as measured by the mini-mental state examination.

The controls were Qazvin residents randomly selected from health centres during the same period. In Iran, health-care and public health services are provided through nation-wide networks. Health centres are in charge of providing health services in their catchment areas. Health centres keep vital health information of the population from their catchment areas. A gender-, age-, and location-matched sample of healthy adults was identified from the records of the health centres. Eligible adults were approached by either telephone or personally at the health centres with written information about the study and were requested to participate in the study. Patients and healthy adults were invited to attend a dental clinic for completing the study measures and undergoing oral clinical examinations.

The study protocol was approved by the Research Ethics Committee of Qazvin University of Medical Sciences (QUMS), and all participants gave their written informed consents.

Measures

Sociodemographic and clinical data

Sociodemographic data such as age, gender, marital status, family income, and occupational status were collected. Clinical data on the lesion level, the aetiology of the SCI, time since injury, medication status, and the ability to perform hand-to-mouth activities were derived from patients' files.

Dry mouth

A single item was used to measure participant's experience of oral dryness. A dichotomous response (yes/no) was used to record dry mouth [18].

Dependence and disability

In order to evaluate dependency and disability in SCI patients, a trained neurologist completed the functional independence measure and the Functional Assessment Measure (FIM + FAM) [19] for each patient. The FIM has 18 items, including motor (13 items) and cognitive (five items) dimensions. All items are rated on a seven-point Likert-type scale that ranged from 1 (totally dependent) to 7 (completely independent), with higher scores indicating higher independency. The FAM has 12 items mainly covering the cognitive domain (nine items) and three items covering the motor domain. The FIM and FAM were unified in the UK version and produced UK FIM + FAM [19]. This 30-item FIM + FAM has been translated into several languages including Farsi [20], and this Iranian version of the FIM + FAM was found to be highly valid and reliable [20].

OHRQoL

OHRQoL was assessed using the oral health impact profile (OHIP-14) which consists of 14 questions assessing the perceived impact of oral health on daily living [21] in patients and healthy controls. The items in OHIP-14 are summarised into seven domains (two items per domain) which comprise functional limitation, psychological discomfort, physical disability, psychological disability, mental disability, social disability, and handicap. All responses are rated on a five-point Likert scale ranging from 0 (never) to 4 (very often/every day). The total score of OHIP-14 was obtained by summing up the response scores and ranged from 0 to 56, with high score indicating poor OHRQoL [21]. The Iranian version of the OHIP-14 reported good reliability, validity, and precision [22].