

—原著—

某市における施設入所高齢者の身体機能の低下，認知症，栄養摂取形態と全身および口腔の健康状態との関連性について

佐藤夏奈¹⁾，ステガロユ ロクサーナ²⁾，柴田佐都子²⁾，黒川孝一³⁾

¹⁾ 新潟大学大学院医歯学総合研究科 口腔生命福祉学専攻博士前期課程（主任：葎原明弘教授）

²⁾ 新潟大学医歯学総合研究科 口腔保健学分野（主任：葎原明弘教授）

³⁾ 新潟大学医歯学総合研究科 福祉学分野（主任：葎原明弘教授）

General and oral health factors associated with physical disability, cognitive impairment, and diet form in an elderly institutionalized Japanese population

Kana Sato¹⁾ , Roxana Stegaroiu²⁾ , Satoko Shibata²⁾ , Kouichi Kurokawa³⁾

¹⁾ *Master's Program of Oral Health and Welfare (Chief: Prof. Akihiro Yoshihara), Graduate School of Medical and Dental Sciences, Niigata University*

²⁾ *Division of Oral Science for Health Promotion (Chief: Prof. Akihiro Yoshihara), Faculty of Dentistry & Graduate School of Medical and Dental Sciences, Niigata University*

³⁾ *Division of Social Welfare (Chief: Prof. Akihiro Yoshihara), Faculty of Dentistry & Graduate School of Medical and Dental Sciences, Niigata University*

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Key words: elderly people, occlusal support, physical disability/bedridden level, cognitive impairment/dementia rating, diet form

Abstract

Although several studies investigated the factors associated with physical function, cognitive abilities and diet form, their results are sometimes controversial or inconclusive. This study investigated the relation between oral and general health of residents of long-term care facilities (LTCF) from a Japanese city and their physical disability, cognitive impairment and diet form. Data collected by the local dental association from residents of 18 LTCFs with whom the association had dental examination agreements were used. Three binomial logistic regression analyses were conducted on 602 full data sets, to investigate the relation between physical disability (bedridden level), cognitive impairment (dementia rating), and diet form and independent variables selected among residents' general and oral health characteristics. The bedridden level was significantly associated with occlusal support [odds ratio (OR) = 1.88; $p = 0.005$], swallowing (OR = 3.47; $p < 0.001$), paralysis (OR = 9.34; $p < 0.001$), and dementia rating (OR = 2.91; $p < 0.001$). Dementia rating was significantly associated with occlusal support (OR = 3.21; $p < 0.001$), and the bedridden level (OR = 3.37; $p < 0.001$). Diet form was significantly associated with occlusal support (OR = 3.35; $p < 0.001$), oral moisture (OR = 3.53; $p < 0.001$), swallowing (OR = 3.50; $p < 0.001$), bedridden level (OR = 7.17; $p < 0.001$), and dementia rating (OR = 1.80; $p < 0.01$). Lack of bilateral occlusal support on natural teeth, fixed or removable prostheses was statistically significantly related with physical disability requiring care, dementia requiring care, and soft diet or enteral nutrition.

抄録

本研究は新潟県内某市における施設入所高齢者の全身および口腔の健康に関わる因子のなかで，身体機能の低下，認知症，栄養摂取形態それぞれとの関連のある因子を明らかにすることを目的とした。そこで某市歯科医師会が歯科健診を行った介護保険施設・特定施設（18施設602名）から収集したデータを解析対象とし，障害高齢者の日常生活自立度（寝たきり度），認知症高齢者の日常生活自立度および栄養摂取形態それぞれと全身健康状態の因子，口腔

健康状態の因子との関連について、3つの二項ロジスティック回帰分析を用いて検討した。

寝たきり度は、咬合支持(天然歯または義歯を含めた補綴物による両側咬合支持)(オッズ比 (OR) = 1.88; $p = 0.005$), 嚥下 (OR = 3.47; $p < 0.001$), 麻痺 (OR = 9.34; $p < 0.001$) および認知症高齢者の日常生活自立度 (OR = 2.91; $p < 0.001$) と有意に関連していた。認知症高齢者の日常生活自立度は、咬合支持 (OR = 3.21; $p < 0.001$) および寝たきり度 (OR = 3.37; $p < 0.001$) と有意に関連していた。栄養摂取形態は、咬合支持 (OR = 3.35; $p < 0.001$), 口腔乾燥 (OR = 3.53; $p < 0.001$), 嚥下 (OR = 3.50; $p < 0.001$), 寝たきり度 (OR = 7.17; $p < 0.001$) および認知症高齢者の日常生活自立度 (OR = 1.80; $p < 0.01$) と有意に関連していた。

以上の結果から、天然歯または義歯を含めた補綴物による両側咬合支持の喪失は、要介護高齢者の身体機能の低下、認知症および経管栄養を含む常食以外の栄養摂取形態と統計的に有意に関連していた。

Introduction

In the fiscal year 2018, 28.1% of Japan population was aged 65 and above, and 14.2% of the population was 75 and above¹. Japan's aging rate is the highest in the world, and the number of persons who are certified as requiring long-term care (LTC) and institutional care services, such as those who are bedridden, or those suffering from dementia, are increasing accordingly². This became an important social issue and efforts are made to prevent care dependency and expand the healthy life years¹. In Japan, stroke and other cerebrovascular diseases rank first among causes of the most severe LTC level (bedridden condition)³. Paralysis and persistent dysphagia, as sequelae of stroke, can also cause functional impairment and institutionalization^{4,5}. Similarly, dementia is a major cause of disability and care dependency for elderly people worldwide⁶. Dementia profoundly affects elders' everyday life, since cognitive abilities have a direct effect on activities of daily living (ADL)². Beside comorbid conditions and cognitive ability, nutrition and swallowing were indicated as factors directly related to ADL in a study on the general and oral health of elderly people who were receiving care services at home due to physical disabilities². Oral health condition (occlusal support⁷, many teeth and denture wearing²) was another factor reported to directly⁷ or indirectly² effect ADL of community dwelling elders. However, for institutionalized elderly similar studies are scarce. While edentulous persons not wearing dentures were at higher risk for physical disability, the effect of tooth loss and lack of dentures for residents with 1-19 teeth on their physical functions was inconclusive⁸.

Among the characteristics of institutionalized elderly people, age and cerebrovascular disorder predicted

cognitive impairment⁸. For elders living in the community, impaired glucose tolerance in diabetes was found to be a risk factor for the onset of Alzheimer's and vascular dementia⁹. An animal experiment showed a decrease in the expression level of genes related to spatial cognitive ability and memory in rats that lost occlusal support, but restoration of the occlusal support suppressed the decrease in the expression level of the gene¹⁰, suggesting that recovery of occlusal support could improve cognitive dysfunction. Moreover, in a large-scale cohort study of older adults (median age 81)¹¹, oral health behaviors that help maintain healthy, functioning teeth were associated with lower risk of dementia. However, other studies did not find a significant correlation between oral health condition and cognitive abilities^{2,8}.

Malnutrition is another factor that increases care dependency². Energy and nutrient (protein, dietary fiber, potassium, calcium, vitamins D, K, and B12) intakes were significantly higher in the elders with regular (ordinary) diet than modified diet forms¹². Previous studies showed that ordinary diet for elders was related with denture wearing, ADL, good oral hygiene¹³, and cognitive function¹⁴, but the population samples were of limited size.

Although several studies investigated the general and oral health factors associated with physical function, cognitive abilities and diet form, their results are sometimes controversial or inconclusive. Therefore, we used the results of annual dental examinations at 18 LTC facilities (LTCF) of a Japanese city, to investigate the relation between oral and general health of their residents and their physical disability, cognitive impairment and diet form. The following three working hypotheses were tested: 1) certain oral and general health-related factors of the residents are related with their physical disability, 2) certain oral and general health-related factors of the residents are