Abstract

Study on the predictors of oral functional decline in the institutional elderly

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【Introduction】

Oral hypofunction was listed as a new disease name for the public health insurance in 2018. However, it is difficult to make an appropriate evaluation using the current diagnostic methods for elderly people with impaired cognitive function, because the instructions for the tests cannot be understood. It is necessary to examine the subjects who can be tested and to detect the deterioration in oral function for the appropriate intervention in the early stage. I hypothesized that the objective evaluation based on the "awareness" of facility staff involved in daily life, not limited to dental professionals could predict the execution possibility of oral function tests and the deterioration in oral function. Previous studies reported that ADL and rinsing were associated with same of oral functions such as tongue pressure and dysphagia. Hence, I focused on both ADL and rinsing for the predictive awareness of oral hypofunction.

In this study, I evaluated oral function, cognitive function, activities of daily living (ADL), and nutritional status in elderly people who are using nursing care facilities, and examined whether ADL and rinsing could predict the feasible tests and deterioration of oral functions.

【Subjects and methods】

The subjects were selected from the elderly who were admitted to nursing homes or using outpatient services. In total, 103 elderly people (17 males, 86 females, average age 85.3 ± 6.8 years) were included in the analyses. All participants consented this study (Clinical Research Ethics Review Approval Number 2018-005).

The survey items included basic information (age, sex, degree of care required), nutritional status (BMI, MNA-SF), cognitive function evaluation (HDS-R, CDR), and 7 items for examination of oral hypofunction. In addition, functional independence measure (FIM), which is an evaluation method of ADL, and rinsing were evaluated for the candidate for the predictor. All statistical analyses were performed using SPSS®

Ver. 25.0 (IBM Japan), and a significance level was set at $p<0.05$.

【Results and Discussion】

1 . Oral function evaluation

61 subjects (59.2%) were able to perform all the oral hypofunction tests, while 42 subjects (40.8%) had one and more impossible tests. The executing rate of oral hypofunction tests differed among the test items. As the CDR score increased, the number of subjects who had difficulty in testing increased. It was considered that the executing rate decreased due to the influence of cognitive decline.

There was no significant correlation between oral hypofunction and MNA-SF if the items of impossible oral hypofunction tests were considered to be “Not decreased”. If the of items impossible oral hypofunction tests were considered to be "decreased," there was a significant correlation between oral hypofunction and MNA-SF. Furthermore, there was a more significant correlation between the executing rate of all tests and MNA-SF.

2. Predictors for the feasibility of all oral function tests

As a result of multiple logistic regression analysis (stepwise method) employing the FIM total score, CDR and rinsing as explanatory variables, there was a significant positive correlation the CDR and rinsing. These results suggested that both CDR and rinsing might be the candidates to predict the feasibility of all tests.

3. Predictor for the deterioration of each oral function

As a result of multiple regression analysis (stepwise method) employing the FIM total score, CDR and rinsing as explanatory variables, there was a significant correlation the between the FIM total score and each of ODK (/pa/, /ta/, /ka/), tongue pressure, masticatory function and EAT-10. The FIM total score was considered to be the candidate to predict the decline in oral function.

Further analyses tried to extract the candidate factors for "awareness" related to oral hypofunction testing from the sub-items of FIM. Representative variables for the sub-items were selected for each of the major FIM exercise item category. The relationship between these sub-items and oral function tests was examined employing age, sex, and CDR as explanatory variables. As a result, changing clothes in the lower body was significantly correlated with ODK (/pa/ and /ta/), tongue pressure, and masticatory function. Transfers to beds, chairs and wheelchairs were significantly correlated with ODK (/ka/). Walking and wheelchair movement were significantly correlated with EAT-10.

【Conclusion】

This study also demonstrated that the number of elderly people with difficulty in oral hypofunction testing was positively correlated the CDR scores.

CDR and rinsing were significantly correlated with the feasibility of tests for oral hypofunction, these results suggested that both CDR and rinsing might be the candidate to predict the feasibility of all tests.

There was a significant correlation between the total FIM score and each of tongue pressure, masticatory function, and EAT-10 of oral hypofunction tests. There was a significant correlation between oral hypofunction and some sub-items of FIM such as changing clothes in the lower body, transfers to beds, chairs and wheelchairs, and walking and wheelchair movement.

This study suggested that the predictive awareness of both FIM and rinsing could predict the feasible tests and deterioration of oral functions.