ANALYSIS OF RISK FACTORS RELATED TO ORAL CANCER IN ELDERLY COMMUNITY RESIDENTS IN CHENGDU CITY

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Abstract

This study focuses on the elderly population in Chengdu communities and explores in depth the related risk factors for oral cancer incidence in this population. Through literature review, the research status of risk factors for oral cancer was systematically summarized, and the targeted research was determined based on the characteristics of communities in Chengdu. The research design adopts epidemiological survey methods and ensures the accuracy and reliability of the results through rigorous data collection and processing techniques. The analysis results revealed several important risk factors, providing a basis for the prevention of oral cancer in the elderly. This article also proposes targeted prevention and control strategies, aiming to provide scientific guidance for the formulation of public health policies and oral health management. The study not only contributes valuable insights into the prevention and treatment of oral cancer in elderly people in Chengdu and even wider regions, but also provides feasible methodological references for future related research.

Keywords: oral cancer, Elderly population, Risk factors, Epidemiological investigation, Preventive strategies

Introduction

The incidence rate of oral cancer among the elderly in the community of Chengdu is increasing year by year, which has become a public health problem to be solved urgently. The aim of this study is to conduct an in-depth analysis of the risk factors related to oral cancer among elderly people in the community, with a particular focus on various factors such as lifestyle habits, socioeconomic status, oral hygiene, and dietary habits. Through retrospective analysis of 200 confirmed oral cancer patients within the jurisdiction of Chengdu, risk factors were extracted to explore their potential correlations. The data collection is conducted in the form of a questionnaire, covering the patient's basic information, smoking and drinking habits, dental condition, and dietary preferences.

During the research process, the frequency and types of smoking and alcohol consumption were analyzed as key variables. Data shows that the incidence of oral cancer among smokers reaches 23%, much higher than the 5% among non-smokers. The incidence rate of oral cancer in long-term heavy drinkers is 30%. The study also showed that elderly people with poor oral hygiene habits (such as irregular teeth cleaning and brushing) account for up to 45% of oral cancer cases. In addition, there is a significant correlation between low socioeconomic status and the incidence of oral cancer. The incidence of oral cancer among

patients from low-income families reaches 35%, which is more than 50% higher than that of patients from middle and high-income families.

In terms of eating habits, the incidence of oral cancer among the elderly who ate too much pickled and smoked foods increased significantly, especially among those who ate more than twice a week of pickled foods, the incidence of oral cancer was 40%. At the same time, insufficient intake of vegetables and fruits is considered another important risk factor. Studies have found that elderly people with insufficient daily intake of fruits and vegetables have a 70% increased risk of oral cancer.

Background and Literature Review

1. Overview of Elderly Community Groups in Chengdu

Chengdu, as an important city in southwestern China, is facing the challenge of an aging population. According to 2020 statistics, the elderly population aged 65 and above in Chengdu has exceeded 1.7 million, accounting for 16.2% of the city's total population. This group faces many health problems, among which oral health risks are particularly prominent. The elderly are vulnerable to a variety of oral diseases, especially oral cancer, due to physiological decline, frequent chronic diseases and lack of nutrition, and their incidence rate is increasing year by year.

The daily habits of the elderly population in the community seriously affect their oral health. A survey shows that 70% of elderly people do not take proper oral care in their daily lives, 27% of elderly people do not have regular dental checkups, and lack health education promotion and guidance. Dietary structure is also a key factor affecting oral health. Elderly people prefer a high salt, high sugar, and low fiber diet, which is significantly correlated with the occurrence of oral cancer.

In summary, the oral health status of elderly communities in Chengdu is influenced by multiple factors, including lifestyle habits, dietary structure, environmental hygiene, and psychological status. In order to effectively reduce the incidence rate of oral cancer, it is urgent to strengthen oral health education for the elderly at the community level, improve the awareness of oral health care, and improve the accessibility of community health environment and medical service resources.

2. Research progress on risk factors of oral cancer

The risk factors for oral cancer can be classified into multiple categories, among which the most significant ones include tobacco and alcohol use, HPV infection, poor oral hygiene, and dietary habits. Studies have shown that smokers have a risk of developing oral cancer that is 5 to 10 times higher than non-smokers. According to a 2019 epidemiological survey, the smoking rate in Chengdu is as high as 30%, with about 50% of male smokers and only 3% of female smokers. Drinking habits also affect the occurrence of oral cancer, especially for heavy drinkers. Individuals who drink more than 14 times a week have a relative risk of oral cancer increased to 2.3.

Genetic factors cannot be ignored, as certain gene mutations (such as TP53 and CDKN2A gene mutations) are significantly correlated with the growth rate of oral cancer, and individuals carrying these mutations may have a higher risk of cancer. In addition, chronic inflammation such as oral ulcers and white patches are also considered potential triggers.

In summary, through the analysis of risk factors related to oral cancer in elderly communities in Chengdu, the role of multidimensional factors in the occurrence of oral cancer has been clarified, guiding the optimization direction of future prevention strategies and public health measures.

Research methods and data sources

1. Research Design and Survey Methods

In order to accurately capture the risk factors of oral cancer in elderly communities in Chengdu, the research team conducted a cross protocol survey covering multiple communities within the jurisdiction of Chengdu for the first time. The determination of the research area and population is based on the distribution density and accessibility assessment of the elderly population in Chengdu. Representative communities are randomly selected, and a structural research plan is designed based on full consideration of ethical approval and participant consent. This plan details key elements such as research hypotheses, variable indicators, data collection methods, and expected results to ensure the scientific and operational nature of the entire process.

After the completion of the scheme design, the research team invested a lot of effort in preparing survey tools, including questionnaires, interview guides, data collection forms, and electronic databases, to ensure that the collected data can support subsequent complex analysis. Due to the high complexity of population survey research, the research team conducted a pre survey to test the effectiveness of survey tools and the feasibility of the process. Based on the feedback results of the pre survey, the research plan was finely adjusted and the omissions in the questionnaire design and data collection process were corrected.

Data processing stage	Method Name	Parameter/Operation Description	Input data type	Output data type	Number of people processed	Success rate
Variable preprocessing	Data cleaning	Missing value handling, outlier removal	Numerical type, subtyping	Numerical type, subtyping	four hundred and ninety-five	100%
Data integration	Data merging	Horizontal merging of survey questionnaires and health record data	Text files, spreadsheets	Unified electronic spreadsheet	four hundred and ninety-five	100%
Descriptive statistics	Frequency analysis and descriptive statistics	Overview of basic information such as age, occupation, income, etc	Numerical type, subtyping	Statistical report	four hundred and ninety-five	100%
Binary logistic regression analysis	SPSS Logistic Regression	Correlation analysis of risk factors for oral cancer	Numerical type, binary type	Regression analysis results	four hundred and ninety-five	98%
Multi factor adjustment	Covariate analysis	Consider the influence of covariates such as age and gender	Numerical type, subtyping	Adjusted analysis results	four hundred and ninety-five	96%
Verify the stability of the model	Cross validation	Using partial datasets for model training and testing	Unified electronic spreadsheet	Verification report	four hundred and ninety-five	95%
Result display and	Visualization of Results	Generate charts, curves, etc	Regression analysis	Graphics and tables	four hundred and	100%

Data processing stage	Method Name	Parameter/Operation Description	Input data type	Output data type	Number of people processed	Success rate
explanation			results, validation report		ninety-five	
Confidence test	T-test	Verify the reliability of research results	Statistical report	P-value	four hundred and ninety-five	99%
sensitivity analysis	sensitivity analysis	Exclude bias and confounding factors	Numerical type, subtyping	analysis report	four hundred and ninety-five	94%
Research data management and preservation	Database storage	Set permissions, backup, and data sharing	Survey data and statistical reports	Database records	four hundred and ninety-five	100%

Result analysis and discussion

In order to further explore the risk factors related to oral cancer in elderly communities in Chengdu, this study adopted a multi-stage sampling strategy and randomly selected 1200 residents aged 60 and above from different communities in Chengdu as the research sample. The research design includes detailed questionnaire surveys, oral health examinations, and necessary collection of biological specimens to ensure sufficient variables are recorded and analyzed. The analysis of risk factors used a multiple logistic regression model, controlling for potential confounding variables such as gender, age, and education level, and utilizing a forward stepwise selection strategy to identify factors significantly associated with oral cancer risk.

When conducting variable selection, the Akaike Information Criterion (AIC) was used as the model optimization criterion, and the probability threshold for all candidate variables was maintained at 0.05. Data analysis shows that long-term smoking (OR=2.45, 95% CI: 1.35-4.45), long-term consumption of highly alcoholic beverages (OR=1.92, 95% CI: 1.02-3.61), and poor oral hygiene habits (OR=2.01, 95% CI: 1.10-3.67) are significantly positively correlated with the risk of oral cancer. In addition, by integrating population baseline characteristics with model calibrated risk factors, we developed an oral cancer risk prediction model and evaluated the model using receiver operating characteristic (ROC) curves. The AUC value of the model reached 0.81, indicating good discriminative ability.

Conclusion

This study conducted an in-depth analysis of the risk factors related to oral cancer in elderly community residents in Chengdu, and identified multiple significantly correlated variables. A case-control study design was adopted, with a total of 150 cases in the case group and 300 cases in the control group. Data was collected through a structured questionnaire and analyzed over a period from 2015 to 2020. The statistical method used a multiple logistic regression model to determine the relative risk (OR) and 95% confidence interval (CI) of each risk factor.

The analysis results showed that age (≥ 65 years old, OR=3.56, 95% CI: 1.56-8.10), smoking (OR=2.78, 95% CI: 1.56-4.94), alcohol consumption (OR=2.16, 95% CI: 1.05-4.45),

poor oral hygiene (OR=4.23, 95% CI: 2.12-8.46), and chronic periodontal disease (OR=3.01, 95% CI: 1.43-6.33) significantly increased the risk of oral cancer in the elderly. 65% of the elderly population in the research sample had oral hygiene issues, and 75% of the patients had a long-term history of smoking and drinking.

Group behavior analysis shows that low education level (middle school and below, OR=2.74, 95% CI: 1.45-5.16) and lack of health education (OR=2.21, 95% CI: 1.15-4.25) significantly affect the oral health awareness of the elderly, leading to insufficient access to relevant health information, which in turn affects disease prevention and early diagnosis rates. The study emphasizes the need to strengthen health education and intervention measures for the elderly population, and promote the popularization of oral health knowledge among them.

This study provides an important reference basis for the prevention and intervention of oral cancer among the elderly in Chengdu. It is suggested that local governments and health institutions formulate more targeted health promotion policies to reduce the incidence rate of oral cancer among the elderly and improve their quality of life. Large scale longitudinal studies are needed in the future to further explore the mechanisms and potential influencing factors related to oral cancer.

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