A Brief Talk on the Current Situation Prevention and Treatment Strategies of Diabetes in China

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Abstract. Nowadays, diabetes is the fastest growing disease among the high incidence chronic diseases in the world. It is one of the main causes of cardiovascular disease, renal failure, and other major diseases. The current situation and prevention of diabetes is one of the key research topics. Some researchers have found the current situation and progress of diabetes in the world, but there is still a lack of unified explanation and systematic research on specific prevention strategies for diabetes in China. Therefore, this paper collects the data from 2008, 2013, and 2018, analyzes the data of China by using the methods of correlation analysis and prediction analysis, and proposes the prevention and treatment measures for diabetes based on the research on the etiology and status of diabetes, and provides a theoretical reference for solving related problems. This study found that the prevalence of diabetes in China showed an increasing trend year by year, and will continue to grow in the future. Men have a higher risk of diabetes than women, and people over 50 years old have a higher risk of diabetes than other age groups. So the prevention and treatment of diabetes, especially diabetes among Chinese people, is very important.

Keywords: Diabetes; non-communicable diseases; prevention strategies.

1. Introduction

As a heterogeneous disease, diabetes mellitus is linked to a number of macrovascular and microvascular diseases consequences [1]. Diabetes now has a significant effect on patients and healthcare systems everywhere in the world. From the most recent International Diabetes Federation (IDF) data, there were about 537 million patients worldwide by 2021. The number of diabetes patients in China reached 141 million, with an incidence rate of 12.8%. So the prevention and treatment of diabetes, especially diabetes among Chinese people, is very important.

This article discusses the present situation of diabetes in China, as well as preventative and treatment methods. The main purpose of this article is to propose prevention and control measures for diabetes according to the research on the etiology and current situation of diabetes, and provide theoretical reference for solving related problems. At the same time, this paper hopes to fill some gaps in the prevention and control of diabetes in the context of healthy China through research, and then propose targeted strategies to better improve the national health level and protect human health.

2. Literature review

2.1. Abroad Research Status

Nowadays, diabetes prevention draws the attention of researchers around the world. Diabetes prevention programs in the real-world differ widely in their effectiveness [2], but overall, the prevention strategies proposed by these studies have one thing in common, which is to intervene and prevent through improving lifestyle.

The European Association for the Study of Diabetes (EASD) again emphasized in its 2004 endorsements of the Diabetes and Nutrition Research Group (DNSG) the interest in avoiding diabetes in Europe through alterations to lifestyle that was evident in the 1980s. Dandan Xie says that a lot of randomized controlled trials (RCTs) have been showing diabetes, especially type-2 diabetes is preventable. Its onset can be significantly delayed by changing dietary habits, losing weight, and

increasing physical exercise [3]. Alison J. Dunkley focuses on the compliance with the guidelines and recommendations in his research, and also has the goal that exercise and diet control can help lose weight and effectively prevent diabetes [2].

In the Middle East, in addition to lifestyle, the environment is also one of the causes of diabetes. Mohammed Taha Al-Hariri divided diabetes patients by region and population density, and carried out prevention and monitoring activities. His subsequent studies discovered that poor built environment conditions and urbanism worsen diabetes and/or its consequences. His studies concluded that "health-oriented" city planning and urban design play a role in the prevention of diabetes [2].

2.2. Current Research Status in China

The focus of research on diabetes prevention in China is three-level prevention. China now attaches great importance to the prevention and treatment of chronic non-communicable diseases, mainly hypertension and diabetes. The General Office of the State Council issued Opinions on Promoting the Development of "Internet + Medical and Health" in 2018, proposing to improve the "Internet + Medical and Health" service system. The book also advised that society should focus on hypertension and diabetes, as well as strengthen chronic disease management services for the elderly available online [4].

At present, Chinese citizens are aware of the harm of diabetes, but some of them are still insufficient for it. So Chinese communities regularly conduct research on hospitals and organizations, making diabetes bulletin boards in order to achieve the goal of primary prevention. At the same time, the government asks for regular inspection and treatment of the condition of high-risk groups of diabetes to achieve secondary prevention. According to the preventive measures for patients, the standardized treatment and disease care of diabetes should be emphasized to achieve three-level prevention [5].

3. Method

3.1. Data collection

This paper analyzes the current situation of diabetes in 2008, 2013 and 2018. The sources of data include:

(1) Population data from the National Bureau of Statistics [6].

(2) National representative data collected in the survey cycle of China's chronic disease and risk factor monitoring from 2018 to 2019, which is used to describe the prevalence of diabetes in China in 2018 [7].

(3) Several published papers, were used to describe the overall prevalence of diabetes in 2008, 2013 and 2018 and the prevalence of diabetes by gender [8, 9].

3.2. Data Filtering

Data inclusion criteria:(1) Epidemiological investigation and research on diabetes; (2) The research scope covers the whole Chinese Mainland, excluding Hong Kong, Macao, and Taiwan; (3) Having clear data sources and clear data content.

Data exclusion criteria: (1) Research that has not been reported or cannot calculate the prevalence rate; (2) Take special populations as research subjects (such as pregnant women, occupational groups, etc.); (3) The study only focuses on one type of diabetes (such as type 2 diabetes); (4) Repeated publications or research with similar data and materials; (5) Review or comment articles

After the above screening, a total of 350838 samples were obtained in the study of Liu Min, Zhou Yuchang, Ma Yue, and others. These samples were obtained through field investigation and monitoring methods, followed by multi-stage stratified cluster random sampling. In this paper, a total of 761 diabetes prevalence samples were obtained in 2008, including 412 male patients and 349 female patients; in 2013, there were 35969 patients with diabetes, including 19269 male patients and 16700 female patients; a total of 23340 diabetes samples were obtained in 2018, including 12731

male patients and 10609 female patients. The existing data within the 18-year prevalence range 11 8%~13.0% so it can be considered valid data.

3.3. Data analysis

3.3.1. Prevalence of diabetes in China in three years

As shown in Table 1, the total prevalence rate of diabetes in China in 2018 and the prevalence rates of men and women were higher than those in 2013, and the total prevalence rate of 2013 and the prevalence rates of men and women were higher than those in 2008. The total prevalence of diabetes in 2018 was 2.37% higher than that in 2013 and 2.39% higher than that in 2008. With regard to the prevalence rate of men and women, the prevalence rate of diabetes in men in 2018 was 3.35% higher than that in 2013, 1.77% higher than that in 2008, the prevalence rate of diabetes in women in 2018 was 3.31% higher than that in 2013, and 1.09% higher than that in 2008. This indicates that the prevalence of diabetes in China has been increasing in recent 10 years and the growth rate is gradually rising. Therefore, concentration should be paid to the prevention and treatment of diabetes, and timely action should be taken by society in time.

Table1. Prevalence of diabetes in China in three years.

Year	Total (%)	Gender composition (%)		Prevalence composition (%)	
		Male	Female	Male	Female
2008	7.89	47.2	52.8	8.53	7.21
2013	10.28	42.77	57.23	10.3	8.3
2018	12.65	44.4	55.6	13.65	11.61

3.3.2. Correlation Analysis Between Gender and Prevalence of Diabetes

Using statistical software SPSS 25.0 and Person bivariate correlation analysis, it is concluded that r=0.9978, which is close to the value r=1, so it can be considered that there is a strong correlation between gender and the prevalence of diabetes. However, there is a certain degree of error due to the small number of groups analyzed.

3.3.3. Morbidity Predictive Analysis

Using the statistical software SPSS 25.0 and the grey prediction model GM (1, 1), the prevalence rate and trend of diabetes in the next 15 years were predicted. It can be seen from Table 2 that the prevalence of diabetes in China is still increasing. The predicted prevalence of diabetes in 2023 is 15.482% and that in 2028 is 19.037%. In 2033, it was 23.409%. The model's average relative error is 0.288%, indicating that the model's fitting effect is good and the prediction results are relatively dependable.

Table 2. Predicted prevalence of diabetes in China from 2023 to 2033.

Prediction year	Predictive value (%)
2023	15.48
2028	19.04
2033	23.41

3.3.4. Comparison of Changes in Prevalence of Diabetes at Different Ages

As shown in Table 3, the average growth trend of the prevalence of diabetes at all ages in China in the past five years, and the prevalence of diabetes at all ages in 2018 was higher than that in 2013. There is a slight difference in diabetes prevalence between 2018 and 2013 for the two age groups of 18~30 and 30~40, but the prevalence of diabetes in 2018 for the three age groups of 50~60, 60~70, and 70+has increased significantly compared with 2013. At the same time, Table 3 also shows that the prevalence of diabetes increases with age. It can be noted that the main groups and high-risk groups suffering from diabetes are middle-aged and elderly adults above the age of 50.

Table 3. Changes in the prevalence of diabetes in different age groups in 2013 and 2018.

Age group(years old)	Prevalence (%)	
	2013	2018
18~	4.3	5
30~	6.4	6.5
40~	9.8	11.1
50~	15	19.3
60~	18.5	23.9
70~	19.2	27.3

4. Strategies and Measures of Diabetes Prevention

The results show that the prevalence of diabetes in China is increasing year by year, and this trend will continue to grow in the future. Among the affected population, the prevalence rate of males is slightly higher than that of females, with middle-aged and elderly people being the main group affected. Based on the above research results, for the prevention of diabetes, the most important strategy is the tertiary prevention: primary prevention, secondary prevention and tertiary prevention [5].

4.1. Primary Prevention

Actively publicize and educate the community residents about diabetes, and actively improve the whole society's awareness of the hazards of diabetes. At the same time, researchers advocate a reasonable and healthy lifestyle, and turn the prevention and treatment of diabetes into people's conscious behavior. To develop a healthy lifestyle, the main focus should be on diet and exercise.

4.1.1. Diet

In terms of specific diets, studies advise against or limit the consumption of processed and unprocessed red meat, white rice, and sugar-sweetened beverages. Diabetes can be avoided by eating the foods listed below. About women, vegetables with green leaves, total dairy goods, and grains that are whole are beneficial to their health. Moderate alcohol consumption and coffee consumption are also related with a lower risk of T2D. Anthocyanin-rich berries and fruits, such as bilberries, blueberries, grapes, apples, and pears, can help both men and women prevent diabetes [3].

4.1.2. Exercise

The mainstream public health recommendation of 30 minutes of moderate-intensity movement five days per week can help prevent or manage diabetes [10]. Adhering to exercise can help improve human function and play a role in reducing weight, thus preventing diabetes.

In addition to the above two ways, keeping a good mental state and having a clean and quiet living environment are also important for the prevention of diabetes [5].

4.2. Secondary Prevention

The secondary prevention mainly focuses on the regular inspection and treatment of the condition of high-risk groups of diabetes, in order to accomplish "early detection, early diagnosis, and early therapy" of the disease.

4.2.1. High-risk Group

In the early stage of diabetes, the symptoms and signs have not been shown or are difficult to perceive. Through early detection and diagnosis of diseases, and timely and appropriate treatment, there will be a greater chance to achieve the cure of diabetes [9].

4.2.2. The Patients

Take metformin and other drugs for diabetes on time. They can not only treat diabetes, but also prevent the occurrence of type 2 diabetes [11].

4.3. Tertiary Prevention

Tertiary prevention is also known as clinical prevention or disease management. It emphasizes the normal treatment and disease care of diabetes.

Long term care services provided by family physician teams are an important measure to realize the three-level prevention of diabetes [12]. Research shows that the majority of diabetes patients are older than 70 years old, and most of them move with difficulty. So it is very important for family physician teams that rely on community health institutions to provide long-term care services for chronic disease patients [13].

5. Conclusion

This study found that the prevalence of diabetes in China showed an increasing trend year by year, and will continue to grow in the future. In terms of gender, the prevalence of diabetes in men is slightly higher than that in women, which indicates that men are more likely to suffer from diabetes than women. In terms of age, this study found that the prevalence of diabetes increased with age, and people over 50 years old were the main group suffering from diabetes. At present, the China's National Health Commission of China has released *the adult diabetes Dietary Guidelines (2023), the National Grass roots diabetes Prevention* and *Management Manual*, and other documents, which show that China attaches great importance to the prevention and treatment of diabetes. However, at present, there are still some problems such as residents' weak awareness of prevention and limited medical level, so the prevention and treatment of diabetes still need the efforts of all parties. Through three-level prevention, is an important measure to prevent diabetes and reduce the prevalence rate to achieve popular science education for the general population, focus on high-risk groups, and control the condition of the sick population? There is a long way to go to prevent and cure diabetes.

For this study, there are few macro studies on diabetes at present, and there are few sample sources available for the author to collect, so there will be some errors in the data analysis results, but these errors are within the error range. At the same time, this study may lack analysis of some diabetes and other pathogenic factors. The above issues will be addressed in future research.

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