Investigation on the Prevalence of Diabetes Mellitus and Its Chronic Metabolic Comorbidities among Urban and Rural Residents in Hunan

Yuan Li
Hunan University of Medicine , Huaihua 418000, Hunan, China
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Abstract: Objective: To investigate the prevalence of diabetes mellitus and its chronic metabolic comorbidities among urban and rural residents in Hunan Province. Methods: From January 2022 to January 2023, 5000 urban and rural permanent residents in Hunan Province were selected for questionnaire survey and physical examination, and the incidence of diabetes and its chronic metabolic comorbidities among the selected residents were counted. Results: ①Among the 5,000 residents in this group, 320 cases (6.4%) had a history of diabetes in the past, and the rate of blood glucose reaching the target was 56.3% (180/320); 305 cases (6.1%) were newly diagnosed with diabetes, and the incidence rate of total diabetes was 12.5% (625/5000). The incidence of diabetes in urban residents was higher than that in rural residents (P<0.05). According to the physical examination results of this group of residents, the incidence of diabetes patients with hypertension, hyperlipidemia, overweight, obesity, hyperuricemia, and metabolic syndrome was significantly higher than that of urban and rural residents without diabetes (P<0.05). Conclusion: The prevalence of diabetes in urban and rural residents in Hunan Province is comparable to the national level. In particular, the incidence of diabetes in urban residents is higher, and diabetic patients are more likely to have chronic metabolic diseases. Therefore, it is necessary to strengthen health education and guide urban and rural residents to form a healthy lifestyle. And it is necessary to strengthen the disease control of diabetic patients and improve the rate of blood sugar compliance.
***Keywords*:** Hunan Province, prevalence of diabetes mellitus, urban and rural residents, chronic metabolic diseases

1. Introduction

Diabetes is a metabolic disease characterized by abnormally elevated blood sugar levels. Currently, the number of diabetic patients is rapidly increasing worldwide. According to the statistics of the International Diabetes Federation in 2017, there are 425 million adults with diabetes in the world, and it is estimated that by 2030, the total number of diabetes patients in the world will exceed 600 million [1] . According to the latest epidemiological survey, the prevalence of diabetes among adults in China is 12.8%, which is much higher than that in developed countries, causing a greater burden on public health events in China. If diabetes does not actively control blood sugar, it can cause various complications, such as diabetic nephropathy, diabetic foot, diabetic retinopathy, etc., and diabetes is a high-risk factor for various chronic metabolic diseases, which has brought greater health and safety to Chinese residents. Big threat [2] . Therefore, how to prevent and treat the disease has become an important topic in clinical research. The occurrence of diabetes and other metabolic diseases is mostly related to genetic and environmental factors, such as family history of diabetes, overweight/obesity, high-fat diet, lack of exercise, staying up late for a long time, etc. [3] . Facing the severe situation of diabetes prevention and control in China, it is necessary to deeply analyze the occurrence of diabetes and related metabolic diseases in China, so as to propose effective prevention and control strategies. In order to solve this problem, the article selected 5,000 urban and rural permanent residents in Hunan Province for questionnaire survey and physical examination. The research is as follows.

2. Clinical data and methods

2.1 Clinical data

From January 2022 to January 2023, 5,000 urban and rural permanent residents in Hunan Province were selected for questionnaire survey and physical examination, including 2,648 males and 2,352 females; their age ranged from 18 to 86 years, with an average of (56.8±10.3) years; There are 2658 cases of urban permanent residents and 2342 cases of rural permanent residents. Inclusion criteria: ①Urban and rural permanent residents in Hunan Province; ②Residents and their family members were informed about this research and voluntarily signed the consent form. Exclusion criteria: Residents with mental illness, cognitive impairment, and dementia.

2.2 Methods

Firstly, through a one-on-one questionnaire survey, including residents' gender, age, education level, past history of diabetes, past history of chronic diseases, etc. The physical examination mainly includes elevation, weight, and blood pressure. At the same time, a glucose tolerance test is performed. The diagnostic criteria for diabetes refer to the diagnostic criteria in the "Guidelines for the Prevention and Treatment of Type 2 Diabetes in China (2017 Edition)".

2.3 Observation indicators

The incidence of diabetes and its chronic metabolic comorbidities among the selected residents were counted.

2.4 Statistical analysis

SPSS 29.0 statistical software was used for statistical analysis , the measurement data was expressed by standard deviation, the mean measurement value of the two groups was tested by t value, the count data was expressed by percentage, and the count values of the two groups were tested by X^2 value. When $P<0.05$, the difference is statistically significant.

3. Results

3.1 The occurrence of diabetes in this group of residents

Among the 5,000 residents in this group, 320 cases (6.4%) had a history of diabetes in the past, and the blood glucose compliance rate of patients with a history of diabetes in the past was 56.3% (180/320); 305 cases (6.1%) were newly diagnosed with diabetes, and the incidence rate of total diabetes was 12.5% (625/5000). The incidence of diabetes in urban residents was higher than that in rural residents ($P<0.05$). See Table 1.

Table 1. Rural areas

Group	Number of cases	Number of cases with past history of diabetes	Newly Diagnosed Diabetes Cases	Total number of diabetic cases	Total Diabetes Incidence (%)
City dweller	2658	174	185	359	13.5
Rural resident	2342	146	120	266	11.4
X^2					5.365
P					0.043

3.2 The incidence of chronic metabolic diseases in this group of residents

According to the physical examination results of this group of residents, the incidence of diabetes patients with hypertension, hyperlipidemia, overweight, obesity, hyperuricemia, and metabolic syndrome was significantly higher than that of urban and rural residents without diabetes ($P<0.05$). See Table 2.

Table 2. Differences in the incidence of chronic metabolic diseases between diabetic patients and non-diabetic urban and rural residents

Group	Number of cases	Hypertension	Hyperlipidemia	Overweight	Obesity	Hyperuricemia	Metabolic syndrome
Diabetic	605	218 (36.0)	256 (42.3)	220 (36.4)	89 (14.7)	157 (26.0)	522 (86.3)
Urban and rural residents without diabetes	4395	442 (10.1)	415 (9.4)	879 (20.0)	368 (8.4)	514 (11.7)	756 (17.2)
X^2		22.521	32.325	12.521	8.965	15.325	50.635
P		0.001	0.001	0.001	0.001	0.001	0.001

4. Discussion

Diabetes mellitus is a metabolic disease caused by multiple factors. Its main feature is hyperglycemia, which is mainly caused by insufficient secretion or dysfunction of pancreatic islets. At present, the specific pathogenesis of diabetes has not yet been clarified clinically, and most scholars believe that genetics and environment are the main factors causing the disease [4] . Since many studies have pointed out that diabetes has a tendency to cluster in families, family history of diabetes is a risk factor for diabetes [5] . Therefore, people whose parents have diabetes should pay more attention to early detection and early intervention, so as to improve the prognosis of patients. Obesity is also a risk factor for diabetes. This is mainly due to the disorder of lipid metabolism in obese people, which can inhibit the function of insulin and cause diabetes to occur. Therefore, obese people need to pay attention to weight control to prevent the occurrence of the disease. Physical activity is

a protective factor for diabetes and is beneficial to human health. Studies have pointed out that people who do more physical exercise have a lower risk of developing diabetes, mainly because physical exercise can improve the body's metabolic status, such as the release of catecholamines after exercise is reduced, and the synthesis of muscle glycogen is increased, which can reduce blood levels. , and can improve the body's sensitivity to insulin and improve insulin resistance [6] . Therefore, exercise is an important means of preventing and treating the disease. Diet is also closely related to the occurrence of the disease. A high-fat, high-calorie diet is a risk factor for the occurrence of diabetes, and increasing the intake of coarse grains can reduce the risk of diabetes. Therefore, diabetic patients need to take active dietary control measures[7]. In addition, bad living habits will also increase the risk of the disease, such as smoking, drinking, and staying up late for a long time will increase the risk of diabetes.

The clinical symptoms of diabetic patients can be summarized as "three excesses and one less", that is, excessive drinking, eating, polyuria and weight loss. With the continuous improvement of China's economic level, coupled with changes in modern people's lifestyles and dietary structures, the incidence of the disease has been increasing, especially in young and middle-aged patients, which has aroused widespread concern in the society [8] . There are no obvious symptoms in the early stage of diabetes. If blood sugar is not actively controlled, various complications can be induced, which poses a greater threat to the health and safety of patients. Therefore, it is necessary to actively analyze the occurrence of diabetes in China, so as to adopt corresponding coping strategies.

4.1 Prevalence of diabetes

China is an area with a high incidence of diabetes. In the 1980s, the incidence of diabetes was less than 1%. However, after 2000, the incidence of diabetes in China has been increasing year by year. By 2022, the total number of people with diabetes in China has exceeded It has reached 129.8 million, and the prevalence of diabetes is 12.8%, which has caused a large burden on the society. Therefore, it is of great practical significance to investigate the prevalence of diabetes. Among the 5,000 residents in this group, 320 cases (6.4%) had a history of diabetes in the past, and the blood glucose compliance rate of patients with a history of diabetes in the past was 56.3% (180/320); 305 cases (6.1%) were newly diagnosed with diabetes, and the incidence rate of total diabetes was 12.5% (625/5000); the incidence of diabetes in urban residents was higher than that in rural residents (P<0.05), which may be due to the busy life of modern cities, and the relative reduction in exercise time of urban residents, especially white-collar workers, long-term desk work, lack of exercise; and urban Residents' diet is more refined, and modern young people like fried chicken, milk tea and other high-calorie diets, which increases the incidence of diabetes in cities; in addition, the pace of urban life is fast, and many urban residents have bad habits such as smoking, drinking, and staying up late, which increases the incidence of diabetes Risk; the working characteristics of rural residents determine that they exercise longer, especially those who are engaged in crop farming, livestock and poultry farming, and forestry planting. Rural residents have a healthier diet, so the incidence of diabetes is relatively lower [9] .

4.2 Diabetic patients with chronic metabolic diseases

Diabetes is a risk factor for various metabolic diseases, especially hyperlipidemia, overweight, obesity and other diseases, which will increase the incidence of various complications and affect the health and safety of patients. According to the physical examination results of this group of residents, the incidence of diabetes patients with hypertension, hyperlipidemia, overweight, obesity, hyperuricemia, and metabolic syndrome was significantly higher than that of urban and rural residents without diabetes (P<0.05). This is mainly because diabetes can cause fat, protein, and carbohydrate metabolism disorders, thereby inducing other chronic metabolic diseases.

4.3 Diabetes prevention and control strategies

In order to reduce the prevalence of diabetes in China, we can start with the following measures: ① Increase the publicity of diabetes-related health knowledge, guide residents to form a good health awareness, strengthen diet and exercise management, quit smoking and drinking, work regularly, and take regular health checkups. So as early as possible to detect and treat; ② For diagnosed diabetic patients, it is necessary to follow the doctor's advice to take medication and actively control blood sugar levels, so as to prevent the occurrence of diabetic complications [10] .

5. Conclusion

In summary, the prevalence of diabetes among urban and rural residents in Hunan Province is comparable to the national level, especially among urban residents, who are more likely to have chronic metabolic diseases. Therefore, it is necessary to strengthen health education and guide urban and rural residents to form Healthy lifestyle, and it is necessary to strengthen the disease control of diabetic patients and improve the rate of blood sugar compliance.

References

[1] Chen Jie, Long Xintian, Mao Yong, et al. Study on the prevalence of diabetes and its influencing factors among people aged 60 and over in Anning City, Yunnan Province [J]. *Chinese Journal of Diabetes*, 2022, 14(4): 345-351.

[2] Ma Xuefei, Li Meng, Liu Haoling, et al. Analysis of the prevalence and related factors of retinopathy in hospitalized patients with type 2 diabetes mellitus in Heilongjiang Province [J]. *Chinese Journal of Diabetes*, 2022, 14(12): 1396-1403.

[3] Xian Yuanyuan, Gao Jing, Bo Dingxi, et al. Meta-analysis of the prevalence of prediabetes in the elderly in China [J]. *Military Nursing*, 2022, 39(12): 62-65,100.

[4] Ding Xianbin, Tang Wenge, Chen Liling, et al. Interaction of family history of diabetes and unhealthy lifestyle on the prevalence of diabetes among residents aged 30 to 79 in Chongqing [J]. *Chongqing Medicine*, 2022, 51(20): 3544-3549, 3554.

[5] Wang Shiyi, Yang Mei, Liu Bihong, et al. Survey on the Prevalence of Mild Vision Impairment in Type 2 Diabetic People Aged 50 and Over in Funing County: A Study on Diabetic Eye Disease in Jiangsu[J]. *Chinese Journal of Experimental Ophthalmology*, 2022, 40(9): 852-858.

[6] Qin Li, Chen Bo, Niu Jingya, et al. Study on the Prevalence of Peripheral Vascular Disease and Its Influencing Factors in Diabetic Patients in Community[J]. *Chinese Journal of Epidemiology*, 2022,43(12):1932-1938.

[7] Gao Yanqing, Gong Litong, Liang Guoxin. Analysis on the Prevalence of Diabetes and Its Influencing Factors in Residents of Daxing District, Beijing [J]. *Chinese Journal of Clinicians*, 2022, 50(11): 1322-1325.

[8] Xue Xiaonan, Rao Chaofeng, Zhu Mingying. Investigation and Research on the Prevalence of Diabetes and Blood Lipid Metabolism in Adults in a Certain Area of Jiangxi Province[J]. *Jiangxi Medicine*, 2022,57(7):805-807,823.

[9] Gong, Qiuhong, Zhang, Ping, Wang, Jinping, et al. Morbidity and mortality after lifestyle intervention for people with impaired glucose tolerance: 30-year results of the Da Qing Diabetes Prevention Outcome Study[J]. *The lancet. Diabetes & endocrinology*. 2019, 7(6). 452-461.

[10] Tao Huihong, Zhu Jiali, Wu Huaying. Analysis on the Prevalence and Influencing Factors of Diabetes Mellitus in People ≥35 Years Old in a Community in Shanghai[J]. *China Primary Health Care*, 2022,36(12):46-48.