P-0825 - Association Between Physical Activity and Abnormal Glucose Metabolism ---- A general population-based cross-sectional study in China

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Figure 1. Clinical characteristics of participants

BMI, body mass index; WC, waist circumference; SBP, systolic blood pressure; HbA1c, hemoglobin A1c; TC, total cholesterol; TG, triglyceride; UA, uric acid; *for $p < 0.05$.

Objective To explore the association between physical activity level and abnormal glucose metabolism among a general population in China.

Methods Data from a random sampled Chinese population aged 26-77 years old were collected. Participants were divided into abnormal glucose metabolism (AGM) group or normal glucose tolerance (NGT) group according to 1999 WHO criteria. Total Physical Activity Energy Expenditure (PAEE), sedentary time and the ratios of PAEE under different domains including work, active transportation, domestic and garden, and leisure-time domain to total PAEE were calculated according to the International Physical Activity Questionnaire. Logistic regression was used to analyze the association between total PAEE, ratios of PAEE under different domains to total PAEE, sedentary time and AGM.

Results

1 Clinical characteristics of participants

Among the eligible 3510 participants, averaged age was 50 ± 12 years old, men accounted for 48.4%. There were 2120 (60.4%) participants in NGT group, and 1390 (39.6%) in AGM group. Compared with NGT group, participants in AGM group were older, more obese, more hypertensive and had a higher proportion of men ($p < 0.05$). The levels of HbA1c, total cholesterol, triglyceride and uric acid were also higher in AGM group ($p < 0.05$). There were no significant difference in total PAEE between the two groups (Figure 1).

2 Association between total PAEE and AGM in general population and in subpopulations stratified by sex, age, BMI and employment

Multivariate logistic regression analysis showed that after adjusting for sex, age, systolic blood pressure, BMI, total cholesterol and intake frequency of red meat, total PAEE (1000 MET-min/week) was negatively associated with AGM (OR, 0.96; 95% CI, 0.94-0.99) in this general population. After stratification, we found that in men, young (26-44 years old) and middle-aged (45-65 years old) subpopulation, overweight (BMI 24-27.9 kg/m²) subpopulation and unemployed subpopulation, total PAEE was negatively associated with AGM as well (Table 1).

3 Association between ratios of PAEE under different domains as well as sedentary time and AGM

In this general population, after adjusting for sex, age, systolic blood pressure, BMI, total cholesterol and intake frequency of red meat, multivariate logistic regression analysis showed that ratios of PAEE under different domains were not associated with AGM. Sedentary time showed no association with AGM in this general population, however, after stratification by sex, age, BMI and employment, sedentary time was positively associated with AGM in men, young subpopulation, overweight subpopulation and unemployed subpopulation (Table 2).

Table 1. Association between total PAEE and AGM

Population	N	OR(95%CI)	Total PAEE(1000MET-min/week)
General population	3510	0.96(0.94,0.99)	
Male	1700	0.96(0.92,0.99)	
Female	1810	0.98(0.94,1.02)	
Young	1234	0.94(0.88,0.99)	
Middle-aged	1901	0.97(0.93,0.99)	
Elderly	375	0.98(0.91,1.05)	
Normal-weight	1078	0.97(0.92,1.03)	
Overweight	1444	0.95(0.91,0.99)	
Obese	988	0.98 (0.93,1.03)	
Employed	2756	0.97(0.94,1.01)	
Unemployed	754	0.89(0.82,0.98)	

Table 2. Association between sedentary time and AGM

Population	N	OR(95%CI)	Sedentary time (h/week)
General population	3510	1.03(0.99,1.07)	
Male	1700	1.05(1.01,1.10)	
Female	1810	0.98(0.90,1.06)	
Young	1234	1.07(1.01,1.13)	
Middle-aged	1901	0.97(0.92,1.03)	
Elderly	375	0.99(0.77,1.28)	
Normal-weight	1078	0.94(0.86,1.04)	
Overweight	1444	1.08(1.03,1.15)	
Obese	988	1.03(0.96,1.09)	
Employed	2756	1.04(0.99,1.08)	
Unemployed	754	1.40(1.03,1.91)	

Conclusions

In this Chinese population, total PAEE was negatively associated with AGM and ratios of PAEE under different domains showed no association with AGM. Although this is a cross-sectional study, it suggests that not only exercise but also increasing total PAEE in daily life may improve glucose tolerance. What's more, age, sex, BMI and employment may influence the above association. Sedentary time was found to be positively associated with AGM in men, young subpopulation, overweight subpopulation and unemployed subpopulation.