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Gender differences in the prevalence of metabolic syndrome and its components among adults with disabilities based on a community health check up data

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ABSTRACT

Metabolic syndrome is highly prevalent in society gradually and has important implications for public health in recent years. The present study aims to examine the gender effect on the prevalence of metabolic syndrome among adults with disabilities. A cross-sectional study was conduct to analyze annual health check-up chart of 419 people with disabilities whose age $\geq$20 years in east Taiwan. We used to diagnose the metabolic syndrome was defined by the Taiwan Bureau of Health Promotion as the presence of three or more of the following five components: abdominal obesity, high blood pressure, high fasting glucose level, high triglyceride level, and low high-density lipoprotein cholesterol level. The results showed that the prevalence of metabolic syndrome was 19.3% in the study subjects (16.8% in men and 23.1% in women; $p = 0.110$). Our study also indicated that the genders were significantly different in the followings (men vs. women): abdominal obesity (33.2% vs. 50.9%; $p < 0.001$), high blood pressure (36.4% vs. 23.7%; $p = 0.006$), high fasting glucose level (18.4 vs. 14.8%; $p = 0.334$), high triglyceride level (24.0% vs. 14.2%; $p = 0.014$) and HDL-C (21.6% vs. 35.5%; $p = 0.002$) among the sample. To prevent the metabolic syndrome occurrence and consequences, the study suggests that the health authorities should put greater efforts to address the metabolic syndrome components, particularly in higher rates of obesity-related health conditions to avoid significant health and health care costs in the future.

1. Introduction

The metabolic syndrome (MetS) is risk factors for cardiovascular disease and its high prevalence has caused a great public health impact in recent years (Ferreira et al., 2007; Grundy, 2006; Kahn, Buse, Ferrannini, & Stern, 2005; Sarafidis, 2007). In 2001, the National Cholesterol Education Program (NCEP) Adult Treatment Panel III (ATP III) proposed a simple set of diagnostic criteria based on common clinical measures including waist circumference, triglycerides, HDL-C, blood pressure, and fasting glucose level. The presence of defined abnormalities in any 3 of these 5 measures constitutes a diagnosis of the

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MetS. The ATP III criteria for the MetS have been widely used in both clinical practice and epidemiological studies (NCEP, 2001).

Our previous study (Lin, Lee, et al., 2011) analyzed medical care use and expenditure of people with disabilities based on a nationwide data in Taiwan, we found that there were more than a quarter of persons with disabilities had been hospitalized for treatments in the national health insurance program during the year 2005. Comparing to the hospitalization rate in general population, our results show people with disabilities are more prone to be hospitalized (27.88% vs. 7.95%). Furthermore, many studies have also indicated that the disabled people were more inclined to take unhealthy risks, poorer health status, met more healthcare barriers and consumed more medical cost than the general population (Lai, Hung, Lin, Chien, & Lin, 2011; Lin et al., 2007; Lin, Lin, Chen, et al., 2010; Lin, Wu, & Lee, 2004; Lin, Lin, Lin, Chang, et al., 2010; Lin, Lin, Lin, et al., 2009; Lin, Lin, Lin, Hsu, et al., 2010; Lin, Lin, et al., 2011; Lin, Hung, Lin, & Lai, 2011). With regard to chronic morbidity, our previous studies have been identified the risk of MetS or its risk factors among people with disabilities, particularly in people with intellectual disabilities (Chang et al., 2012; Hsu et al., 2012; Lin, Lin, Yen, Loh, & Chwo, 2009; Lin, Lin, Hsieh, & Lin, 2010; Lin, Lin, Lin, Chang, et al., 2010; Lin, Lin, & Lin, 2010), they suggests that it is necessary to monitor and set up a follow-up health policy for children and adults with disabilities in healthcare system. However, there is little information to present the gender disparity of MetS among people with disabilities in the previous studies. The present study aims to examine the gender effect on the prevalence of MetS among adults with disabilities based on community health check-up data.

2. Methods

We conducted a cross-sectional study which analyzed the annual health check-up chart of adults with disabilities in east Taiwan. Those participants can utilize the health check-up which provided freely by a local government in the year of 2011, and this research cooperative approval was received from the local health department. The study samples included 419 adults with disabilities whose age $\geqq$20 years. The criteria we used to diagnose the MetS was defined by the Taiwan Bureau of Health Promotion (2007) as the presence of three or more of the following five components (Table 1): abdominal obesity (waist circumference, WC: $\geq$90 cm in men, $\geq$80 cm in women), high blood pressure (BP; systolic BP $\geq$130 mmHg or diastolic BP $\geq$85 mmHg), high fasting glucose level (FG $\geq$100 mg/dL), high triglyceride level (TG $\geq$150 mg/dL), and low high-density lipoprotein cholesterol level (HDL-C $<$40 mg/dL in men, $<$50 mg/dL in women).

Data were analyzed by statistical software SPSS 18.0; we used number, percentage, mean, standard deviation (SD) and 95% confidence interval (CI) to describe the prevalence of MetS and its components. In addition, a Chi-square method was conducted to test the gender difference on prevalence of MetS and its components.

3. Results

The study sample included 59.7% male participants, and 40.3% were women; their average age was 29.98 $\pm$ 4.89 years (range = 20.3–39.8 years). In this sample, 34.8% had an intellectual disability, 29.1% were psychosis, 15.5% were physical disability and 10.3% were affected with multiple disabilities.

Table 2 provided the prevalence of MetS and its components in adults with disabilities. The results showed that the prevalence of MetS was 19.3% in the study subjects (16.8% in men and 23.1% in women; $p = 0.110$). Biochemical data analyses showed that the abnormality rates of each component of MetS were as follows (men vs. women): abdominal obesity (33.2% vs. 50.9%; $p < 0.001$), high blood pressure (36.4% vs. 23.7%; $p = 0.006$), high fasting glucose level (18.4 vs. 14.8%; $p = 0.334$), high triglyceride level (24.0% vs. 14.2%; $p = 0.014$) and HDL-C (21.6% vs. 35.5%; $p = 0.002$) among the sample.

Of the study subject, Table 3 showed that there were 68.5% cases had 1 or more of these risk factors, whereas 38.9% had 2 or more, 19.3% had 3 or more and 8.4% had 4 or more. There were 0.7% subjects who had all 5 of these risk factors. A

Table 1
Clinical identification of the metabolic syndrome.

Risk factor components	Defining level
Abdominal obesity[a] (cm)	
Men	$\geqq$90
Women	$\geqq$80
High blood pressure, mmHg	
Systolic blood pressure (SBP)	$\geqq$130
Diastolic blood pressure (DBP)	$\geqq$85
High Fasting glucose level (mg/dL)	$\geqq$100
High triglyceride level (mg/dL)	$\geqq$150
Low HDL-C level[b] (mg/dL)	
Men	$<$40
Women	$<$50

Source: Taiwan Bureau of Health Promotion (2007).

[a] Abdominal obesity: waist circumference.
[b] HDL-C, high-density lipoprotein cholesterol.