ISPOR 22th Annual European Congress,
2-6 November 2019, Copenhagen, Denmark PDB73

Relationship among Metabolic Syndrome Risk Level, Body Composition and Lipid Profiles in Adults Living in Mongolia

Jae Yong Yoo, Ph.D. RN[1], Jin Hee Kim, Ph.D, MPH, RN[2], Jin Sun Kim, Ph.D[3], RN, Bolorchimeg Battushig, DDS[4]

[1] Assistant Professor, Department of Nursing, Chosun University, South Korea, [2] Director (Project Principal Investigator), Leading University Project for International Cooperation, Assistant Professor, Department of Nursing, Chosun University, South Korea, [3] Professor, Department of Nursing, Chosun University, South Korea, [4] Assistant Professor, Department of Nursing, Mongolian National University, Mongolia

Background

Metabolic syndrome (MetS) is a cluster of the most dangerous CVD risk factors, and is characterized by abdominal obesity, impaired glucose intolerance, dyslipidemia, and hypertension. The most salient predictors of MetS include cigarette smoking and a sedentary lifestyle. The prevalence of metabolic syndrome in the United States is around 35%. In Asian countries, there are 16.5%, 24.6%, 25.6% , Singapore 20.2%, Taiwan 25.5%, China 21.3%, Malaysia 34.3% and Mongolia 32.8%, and this prevalence is also increasing continuously. Especially in Asia, these countries are considered to be rapidly changing into industrialization and urbanization. In Asia, especially in Mongolia, the risk of this MetS is expected to be higher due to geographical and cultural characteristics. The characteristics of Mongolian diet are mainly meat foods from livestock and food consumption related to vegetables is reported to be limited. It is very important to detect and manage early because it causes cardiovascular complications and increases mortality. The NCEP-ATP III and the International Diabetes Federation's prophylactic management strategy for MetS emphasized the strategy of prevention and management of primary and secondary disease through improved lifestyle behaviors, and this is why the incidence of cardiovascular and related complications in subjects with MetS.

Purpose

Until now, studies on the MetS of Mongolian people are very rare. The purpose of this study was to identify the risk revels of MetS among adults in the Mongolian and to examine their association with body composition and cholesterol indicators. These data will be provided basic data for establishing a systematic prevention and management strategy for MetS in Mongolia.

Methods

❖Project Introduction

The 'Leading University Project for International Cooperation' is a project to support the necessary department building/remodeling and community development programs in universities in developing countries by utilizing the resources and capabilities of Korean universities as a whole. The cooperation project between Chosun University and Mongolian National University started in 2017. The project is supported by the Korea Research Foundation and the Ministry of Education.

❖Research Design and Data Collection

This cross-sectional study was performed in 100 adult Mongolians (24 men, 76 women). The subjects of this study recruited local residents in Ger, a traditional house in Ulaanbaatar, Mongolia. The criteria for selection of the subjects were: 1) male and female adults over 20 years of age, 2) persons with cognitive ability to communicate routinely, 3) those who understood the purpose of the study and agreed in writing to participate. Among the community residents, they were excluded if they were currently suffering from major wasting diseases (terminal cancer, severe respiratory disease, etc.). Body composition was measured using the InBody270®; bioelectrical impedance analyzer and blood lipids and glucose were assessed via the Cholestech LDX® analyzer. The prevalence of MetS, as defined by modified National Cholesterol Education Programme's Adult Treatment Panel III criteria with Asian cutoffs, was determined.

❖ Data Analysis

1) The general/clinical characteristics, anthropometry, vital signs, body composition, and MetS diagnostic indicators are analyzed by descriptive statistics (frequency, percentage, mean, standard deviation). 2) Differences in the levels of physical measurements, body composition, and MetS according to general/clinical characteristics are analyzed by independent sample t-test, chi-square test, ANOVA analysis and Scheffe test. 3) and the relationships between major variables were analyzed through Pearson's correlation coefficient.

Results

■ *General / Clinical Characteristics of Participants* *(N=100)*

Variables	N(%), M±SD	Variables	M±SD
Gender: Male	24(24.0)	Body Composition analysis	
Female	76(76.0)	Total body water (L)	32.6±6.1
Age (years)	46.7±11.8	Protein (kg)	8.7±1.6
Height (cm)	157.9± 8.3	Minerals (kg)	3.0±0.5
Body weight (kg)	72.8±15.4	Body fat mass (kg)	28.3±11.1
BMI (kg/m^2)	29.2±5.9	Fat free mass (kg)	44.5±8.3
Normal	15 (15.0)	Skeletal muscle mass (kg)	24.5±5.0
Overweight	11 (11.0)	Percent body fat (%)	37.9±8.9
Obese	74 (74.0)	Degree of obesity (%)	137.7±28.7
Abdominal Circumference (cm)	95.0±13.4	Waist-hip ratio	0.9±0.1
Blood pressure (mmHg)		Segmental Lean Impedence	
systolic BP	141.4±23.2	Right arm (kHz)	303.4±47.3
diastolic BP	86.5±12.3	Left arm (kHz)	311.5±51.8
Pulse (per minute)	75.4±10.2	Trunk (kHz)	21.5±3.0
Total Cholesterol (mg/dL)	193.7±36.9	Right leg (kHz)	248.0±36.4
HLD-C (mg/dL)	52.1±14.4	Left leg (kHz)	249.7±38.3
LDL-C (mg/dL)	109.1±30.6		
Triglyceride (mg/dL)	162.6±74.5		
Fasting Glucose Level (mg/dL)	105.6±36.1		

■ *Prevalence of MetS components and MetS in study participants*

Variables	Yes, N(%)	Variables	Yes, N(%)
Abdominal Circumference (cm)		Number of MetS components	
Male ≥ 90, Female ≥ 80	79 (79.0)	0	5 (5.0)
High Blood pressure (mmHg)		1	17 (17.0)
SBP ≥130 or DBP ≥ 85	72 (72.0)	2	21 (21.0)
Elevated Triglycerides (mg/dL)		3	22 (22.0)
≥ 150	46 (46.0)	4	23 (23.0)
Reduced HDL-C (mg/dL)		5	12 (12.0)
< 40 in male and < 50 in female	37 (37.0)		
Elevated glucose (mg/dL)			
fasting glucose ≥ 100	43 (43.0)		
Prevalence of MetS	57 (57.0)		

■ *Differences body composition with or without MetS*

Abdominal circumference (100.4 vs. 88.0cm), body fat mass (31.7 vs 23.7 kg), visceral fat area (164.7 vs 125.7 cm^2) were higher in subjects with MetS than in those without the MetS.

■ *Associations of Body composition with the number of MetS components*

Bivariate Pearson's correlation analysis showed that body composition had a sign ignificantly correlation with the number of MetS components. The number of MetS components was significantly related to age (r=.271), body weight (.487), BMI (.495), total body water (.272), protein (.265), minerals (.258), body fat mass (.471), visceral fat level (.370), waist-hip ratio (.418), obesity degree (.479), impedence of right arm (-.365), left arm (-.368), trunk (-.327), right leg (-.367), and left leg(-.433).

Conclusions

In this study, adults in Mongolia were found to have a high risk of exposure to MetS and we found that the risk level of MetS was related to body composition and visceral adiposity. The efficient primary health promotion strategies such as lifestyle modificati on programs are needed to prevent various chronic diseases caused by MetS.

Acknowledgment

This study was supported by the Korean Research Foundation and the Ministry of Education *'Leading University Project for International Cooperation Project' (NRF-2016H1A7A2A0291 3910)* in Chosun University, Korea.

Contact information: ***jinheeara@chosun.ac.kr***