Incidence of and factors associated with metabolic syndrome, south-east Islamic Republic of Iran

Khadijeh Farmanfarma,[1] Alireza Ansari-Moghaddam,[1] Mahmoud Kaykhaei,[1] Mehdi Mohammadi,[1] Hosein Adineh[2] and Hasan Aliabd[1]

[1]Department of Epidemiology & Biostatistics, Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Islamic Republic of Iran. [2]Department of Epidemiology & Biostatistics, School of Health, Iranshahr University of Medical Sciences, Iranshahr, Islamic Republic of Iran. (Correspondene to: Hasan O. Aliab: hokatialiabad@gmail.com).

Abstract

Background: Metabolic syndrome is an important cause of cardiovascular disease. Mortality from cardiovascular disease is 12.82 deaths/100 000 population in Zahedan, south-east Islamic Republic of Iran.

Aims: This study aimed to determine the incidence of metabolic syndrome and its predicting factors in Zahedan city.

Methods: All participants without metabolic syndrome in a 2009 study in Zahedan, available in 2017, were included in this study. Metabolic syndrome was diagnosed based on the criteria of several organizations. Anthropometric indices and blood pressure were measured and blood tests were done. Age-standardized incidence of metabolic syndrome was calculated and its predictors were evaluated in a logistic regression analysis.

Results: Mean age (standard deviation) of the participants was 45.46 (12.63) years in 2017. The incidence of metabolic syndrome varied from 17.21% to 27.18% depending on the criteria used and it was higher in women. High age-standardized incidence was associated with large waist circumference (55.81%) and high blood pressure (25.32%). The highest adjusted odds ratios (OR) for metabolic syndrome were for high triglycerides (OR = 23.75; 95% confidence interval (CI): 9.92–56.84%), large waist circumference (OR = 22.42; 95% CI: 9.03–55.70%), high blood pressure (OR = 16.91; 95% CI: 8.54–33.50%) and high fasting blood sugar (OR = 13.22; 95% CI: 6.74–25.94%). Waterpipe smoking, sex, low-density lipoprotein and wrist circumference were also associated with metabolic syndrome.

Conclusions: The incidence of metabolic syndrome has increased in Zahedan. Effective, interventions, including to promote healthy diet, physical activity and avoidance of waterpipe smoking, are needed to control this condition.

Keywords: metabolic syndrome, incidence, risk factors, Iran

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Introduction

Metabolic syndrome is an asymptomatic pathophysiological condition characterized by high blood pressure, central obesity, insulin resistance, dyslipidaemia and hyperglycaemia *(1)*. The prevalence of this disorder has been increasing in recent years and stands at about 25% globally; it is therefore among the main health problems in the world *(2,3)*. The incidence of metabolic syndrome has been reported to range from 28 persons per 1000 persons-year to more than 70 per 1000 persons-year in different regions of the world *(4,5)*. As a result of rapid economic changes, the increased popularity of the western lifestyle and lack of physical activity, the world faces the threat of obesity and type 2 diabetes epidemics. If the current trend in obesity and type 2 diabetes continues unchanged, the incidence of metabolic syndrome will be expected to increase, especially in developing countries *(2,6)*. According to epidemiological studies, the incidence of metabolic syndrome is higher in women than men *(5,7)*. Factors, such as socioeconomic status, lack of physical activity, smoking, family history of diabetes, obesity and the western lifestyle, increase the risk of metabolic syndrome *(8)*. Most studies on the incidence and risk factors of metabolic syndrome have been conducted in developed countries or regions where the populations have a relatively high socioeconomic status. Few studies have been done in more deprived regions and regions with low income *(9)*. Therefore, we aimed to determine the incidence and predictors of metabolic syndrome in Zahedan city (Sistan and Baluchestan province), south-eastern Islamic Republic of Iran. This city is among the most deprived regions of the country and is situated in vicinity of Pakistan and Afghanistan.

Methods

Study design and sample

A cohort study was conducted on the urban population of Zahedan city, south-eastern Islamic Republic of Iran.

A cross-sectional study was conducted on 1802 participants from September 2008 to March 2009 *(10)*. The participants were Iranians aged more than 20 years with no intellectual disability or haemorrhagic diseases. According to random cluster sampling method, Zahedan was divided into 20 regions and number of participants were selected from each area proportional to size.

In 2017, all participants without metabolic syndrome in 2009 were followed and invited to participate in the current study. In the 2009 study, 1351 people were found not to have metabolic syndrome based on International Diabetes Federation (IDF) criteria *(11)*, 1424 based on National Cholesterol Education Program-Adult Treatment Panel, (NCEP-ATP) III criteria *(11)*, and 1333 based on American Heart Association and National Heart, Lung and Blood Institute (AHA/NHLBI) criteria *(11)*. In 2017, samples were selected based on IDF criteria (n = 585), NCEP-ATP III criteria (n = 622), and AHA/NHLBI criteria (n = 578).

Although, it was impossible to reach all eligible individuals from the study conducted in 2009, the number of missing participants was similar in all the clusters and the people surveyed were a reasonably good representation of the city. In 2017, the research team contacted the study participants through their profile recorded in 2009. An appointment was made with the participants and a trained team, including interviewers and a laboratory expert, visited them at their homes.

Data collection

The objectives of the study were explained to individuals and those who signed the written informed consent form were enrolled in the study. Data were collected using standard questionnaires. Blood samples were collected after an 8–12 hours fasting period. Anthropometric indices were measured.

Blood samples of the participants were centrifuged to separate serum and maintained for 24 hours at –20 °C and for 6 months at –80 °C. Serum glucose, triglycerides and cholesterol were measured based on calorimetric methods by standard kits (Bioteck) using an ELAN 2000 autoanalyser. High-density lipoprotein (HDL) and low-density lipoprotein (LDL) were measured by direct methods. Anthropometric indices (height, weight and waist circumference) were measured. Weight was measured using a Seca scale (precision: 100 g) while in light clothing and no shoes. Height was measured using a Seca stadiometer in a standing position without shoes and shoulders in a natural position (precision: 1 cm). Waist circumference was measured at the narrowest point at the end of natural exhalation, using a stretch-resistant cloth tape without any pressure on body (precision: 0.1 cm). Blood pressure (systolic and diastolic) was measured twice with 10 minutes between measurements using a standard sphygmomanometer with an appropriate arm cuff placed on the right arm after sitting for 15 minutes. The average of the two measurements was calculated and considered the final blood pressure.

Each participant had a face-to-face interview to complete a semistructured questionnaire to evaluate nutritional information, physical activity and waterpipe smoking.

Statistical analysis

Data were entered in *SPSS*, version 16. Mean and standard deviation (SD) were used to describe quantitative variables. Numbers and percentages were used to describe qualitative variables. Data were analysed the chi-squared test and logistic regression analysis with data presented as odds ratios (OR) and 95% confidence intervals (95% CI). For calculating age-standardized incidence rates of metabolic syndrome and its components, participants were first classified into age groups based on their age in 2013, which was midpoint of study duration (2009–2017). The adjusted incidence rate in 2017 was the weighted mean of incidence rates in age groups weighted by the proportion of the population in 2015 census.

Ethical concerns

The review board of Zahden University of Medical Sciences appproved the study (number: 8140).

Results

Participants were selected based on IDF criteria (n = 585), NCEP-ATP III criteria (n = 622) and AHA/NHLBI criteria (n = 578). AHA/NHLBI criteria were used to describe the participants' information because there were no statistically significant differences between different definitions. Thus, based on AHA/NHLBI criteria, 578 participants (47.4% women and 52.6% men) were included in the 2017 study. Mean age of participants was 45.46 (SD 12.63) years at the end of follow-up period. About half of the participants (48.4%) had up to a high-school diploma, 34.6% had a university degree and 17.0% were illiterate in 2017.

Metabolic syndrome

The direct age-standardized incidence rate of metabolic syndrome was 27.18% (95% CI: 23.50–31.09%) based on AHA/NHLBI criteria, 24.48% (95% CI: 21.03–28.34%) based on IDF criteria, 19.73% (95% CI: 16.57–23.12%) based on NCEP-ATP III criteria and 17.21% (95% CI: 14.29–20.47%) based on ATP III criteria (Table 2). Crude and age-standardized incidence rates of metabolic syndrome were higher in women than men based on all the criteria (Table 2). Incidence rate varied in men from 9.22% (95% CI: 6.33–12.95%) to 20.74% (95% CI: 16.25–25.83%), and in women from 26.86% (95% CI: 21.69–32.37%) to 35.27% (95% CI: 29.44–41.43%).

Components of metabolic syndrome

Based on all the criteria used for measuring metabolic syndrome, the highest crude and age-standardized incidence rates of metabolic syndrome were associated with waist circumference and blood pressure and the lowest rates were associated with HDL cholesterol level (Table 4)

Based on the different diagnostic criteria, the age-standardized incidence rate for abnormal fasting blood sugar varied from 14.04% (11.39–17.10%) to 23.35% (95% CI: 19.89–27.12%). In all the calculations, the incidence rate was higher in women than men. The age-standardized incidence rate for abnormal triglycerides varied from 12.22% (95% CI: 9.53–15.15%) to 13.40% (95% CI: 10.79–16.39%). In all the calculations, the incidence rate was lower in women than men. The age-standardized

Table 1 Criteria for diagnosis of metabolic syndrome by diagnostic guideline

Criterion *(11)*	NCEP-ATP III[a]	IDF[b]	AHA/NHLBI[a]	ATP III[a]
Waist circumference (cm)				
Males	≥ 102	≥ 94	≥ 94	≥ 102
Females	≥ 88	≥ 80	≥ 80	≥ 88
HDL cholesterol (mg/dL)				
Males	< 40	< 40	< 40	< 40
Females	< 50	< 50	< 50	< 50
Triglycerides (mg/dL)	≥ 150	≥ 150	≥ 150	≥ 150
Fasting glucose (mg/dL)	≥ 100	≥ 100	≥ 100	≥ 110
Blood pressure (mmHg)	≥ 130/85	≥ 130/85	≥ 130/85	≥ 130/85

NCEP-ATP = National Cholesterol Education Program-Adult Treatment Panel; IDF = International Diabetes Federation; AHA/NHLBI = American Heart Association and National Heart, Lung and Blood Institute; HDL = high-density lipoprotein.

[a]*Three of five required.*

[b]*Central adiposity required; two of subsequent four required.*

incidence rate for abnormal HDL cholesterol ranged from 1.39% (95% CI: 0.52–2.66%) to 1.97% (95% CI: 0.95–3.38%). The rate was similar in women and men.

Based on the different diagnostic criteria, the age-standardized incidence rate for abnormal blood pressure varied from 24.50% (95% CI: 21.03–28.34%) to 25.32% (95% CI: 21.90–28.99%), and was higher in men than women. The age-standardized incidence rate for abnormal waist circumference varied from 32.65% (95% CI: 28.89–36.59%) to 55.81% (95% CI: 51.54–59.98%). The rate was markedly higher in women than men (Table 4).

Risk factors associated with the metabolic syndrome

Table 4 shows the risk factors associated with metabolic syndrome. In multivariable logistic regression analysis, after controlling for confounders, triglycerides, waist circumference, blood pressure, fasting blood sugar, waterpipe smoking, sex, LDL cholesterol and wrist circumference significantly increased the risk of metabolic syndrome ($P < 0.05$).

Discussion

After an 8-year follow-up, we found that the incidence of metabolic syndrome in our sample varied from 17.21% to 27.18% depending on the diagnostic criteria used. In addition, the incidence of metabolic syndrome was higher in women than men. With regard to the components of metabolic syndrome, the highest incidence rate was observed with waist circumference, followed by blood pressure, fasting blood sugar, triglycerides and HDL cholesterol. Moreover, in multivariable model, triglycerides, waist circumference, blood pressure, and fasting blood sugar had the highest predictive values for incidence of metabolic syndrome in the target population, followed by waterpipe smoking, sex, LDL cholesterol, and wrist circumference, meaning they significantly increased the risk of metabolic syndrome.

The age-standardized incidence rate of metabolic syndrome in one of the most deprived regions of the Islamic Republic of Iran was similar to the rates reported in studies in Tehran (capital of Islamic Republic of Iran), Isfahan (central Islamic Republic of Iran) *(7,12)*, China *(13)*, Maryland (United States of America) *(14)* and Taiwan *(5)*. In addition, similar to many studies published in other regions of the world, this age-standardized incidence rate was higher in women than men *(6,12,13,15)*.

The difference in incidence rate between men and women can be attributed to the increased triglyceride level, waist circumference and reduced HDL cholesterol levels with age in women *(6)*. In addition, sex hormones and hormone therapy during menopause in women may contribute to this difference *(15,16)*. Similarly, lack of physical activity among women exposes them to a greater risk of obesity than men *(17)*. In our study, the highest incidence rate was observed for waist circumference, blood pressure, fasting blood sugar and triglycerides, which is similar to other studies in other regions *(18–20)*. In logistic regression analysis, triglycerides, waist circumference, blood pressure and fasting blood sugar were the most important predictors of metabolic syndrome, as reported in other studies *(5,21–23)*. In the recent years, in many developing regions of the world including the region in our study, changes have occurred in the people's lifestyle (such as increased popularity of high-fat diets and low physical activity) along with industrial developments. These changes may have resulted in an increase in weight, obesity and blood triglyceride levels in our population *(23)*. In countries of South Asia including the Islamic Republic of Iran, waist circumference is reported to be high among people who are not obese. A high percentage of body weight is due to reduction of muscle tissue, thickness of subcutaneous fat tissue and insulin resistance, factors that greatly contribute to the incidence of metabolic syndrome *(17)*. Blood pressure can play an important role in causing insulin resistance and increasing fasting blood sugar, and both of these variables are components of metabolic syndrome *(23)*. Furthermore, central obesity is a main cause of high blood pressure in the Iranian population *(8)*. Consumption of carbohydrates, especially refined grains (as a main source in diet of the Iranian population),

Table 2 Incidence of metabolic syndrome in men and women, Zahedan, 2017

Population	Crude incidence rate, % (95% CI)				Age-standardized rate, % (95% CI)			
	AHA/NHLBI criteria	NCEP-ATP III criteria	ATP III criteria	IDF criteria	AHA/NHLBI criteria	NCEP-ATP III criteria	ATP III criteria	IDF criteria
Men	20.74 (16.25–25.83)	12.81 (9.35–16.97)	10.49 (7.37–14.35)	17.00 (12.92–21.73)	19.76 (15.33–24.74)	11.48 (8.27–15.58)	9.22 (6.33–12.95)	15.84 (12.03–20.64)
Women	35.27 (29.44–41.43)	29.56 (24.22–35.34)	27.50 (22.35–33.12)	35.00 (29.07–41.04)	34.80 (29.07–41.04)	28.70 (23.54–34.58)	26.86 (21.69–32.37)	34.70 (29.07–41.04)
Total	25.73 (23.84–31.46)	20.53 (17.35–24.01)	18.37 (15.36–21.70)	25.26 (21.71–29.08)	27.18 (23.50–31.09)	19.73 (16.57–23.12)	17.21 (14.29–20.47)	24.48 (21.03–28.34)

CI = confidence interval; AHA/NHLBI = American Heart Association and National Heart, Lung and Blood Institute; NCEP-ATP = National Cholesterol Education Program-Adult Treatment Panel; IDF = International Diabetes Federation.

Table 3 Incidence of the components of metabolic syndrome in men and women, by criteria used for diagnosis, Zahedan, 2017

Component	Crude incidence rate, % (95% CI)				Age-standardized rate, % (95% CI)			
	AHA/NHLBI criteria	NCEP-ATP III criteria	ATP III criteria	IDF criteria	AHA/NHLBI criteria	NCEP-ATP III criteria	ATP III criteria	IDF criteria
Fasting blood sugar								
Men	23.80 (19.05–29.09)	24.06 (19.48–29.13)	13.58 (10.04–17.79)	23.66 (18.97–28.89	21.84 (17.18–26.92)	21.58 (17.18–26.47)	12.44 (8.96–16.43)	21.74 (17.13–26.76)
Women	23.25 (18.24–28.89)	22.99 (18.14–28.43)	15.71 (11.65–20.51)	23.25 (18.24–28.89)	23.09 (18.24–28.89)	21.97 (17.14–27.26)	15.03 (11.02–19.73)	22.79 (17.88–28.48)
Total	23.55 (20.07–27.31)	20.53 (17.35–24.01)	14.56 (11.85–17.63)	23.47 (20.01–27.21)	23.35 (19.89–27.12)	19.73 (16.57–23.12)	14.04 (11.39–17.10)	23.08 (19.68–26.84)
Triglycerides								
Men	14.62 (10.79–19.19)	15.00 (11.27–19.39)	15.12 (11.40–19.49)	14.66 (10.86–19.18)	14.27 (10.49–18.81)	13.80 (10.17–18.01)	14.04 (10.31–18.13)	14.20 (10.57–18.81)
Women	10.85 (7.33–15.30)	12.04 (8.43–16.49)	12.14 (8.55–16.55)	10.85 (7.33–15.30)	9.5 (6.36–13.97)	11.40 (7.81–15.67)	10.76 (7.34–14.94)	9.18 (6.05–13.52)
Total	12.86 (10.18–15.94)	13.63 (10.97–16.66)	13.74 (11.09–16.74)	12.90 (10.23–15.97)	12.22 (9.53–15.15)	12.68 (10.06–15.56)	13.40 (10.79–16.39)	12.26 (9.58–15.19)
HDL cholesterol								
Men	1.41 (0.38–3.59)	2.28 (0.92–4.65)	2.25 (0.91- 4.59)	1.38 (0.37 –3.51)	1.27 (0.38–3.59)	1.91 (0.72–4.21)	1.99 (0.71–4.16)	1.27 (0.37–3.51)
Women	2.35 (0.86–5.05)	2.58 (1.04–5.24)	2.52 (1.02–5.13)	2.35 (0.86–5.05)	1.88 (0.63–4.51)	1.84 (0.60–4.25)	1.84 (0.58–4.16)	1.98 (0.63–4.51)
Total	1.86 (0.89–3.39)	2.42 (1.33–4.03)	2.38 (1.30–3.96)	1.84 (0.88–3.36)	1.39 (0.52–2.66)	1.97 (0.95–3.38)	1.67 (1.06–3.54)	1.41 (0.63–2.88)
Blood pressure								
Men	29.25 (24.11–34.81)	29.06 (24.14–34.37)	28.70 (23.83–33.96)	28.66 (23.61–34.14)	28.57 (23.47–34.10)	28.06 (23.26–33.39)	27.73 (22.96–32.99)	27.85 (22.99-33.44)
Women	20.93 (16.13–26.40)	20.80 (16.15–26.09)	21.78 (17.09–27.08)	20.93 (16.13–26.40)	20.20 (14.19–23.62)	19.91 (15.49–25.31)	21.16 (16.44–26.32)	19.90 (15.08–25.15)
Total	25.36 (21.78–29.20)	25.25 (21.80–28.94)	25.49 (22.06–29.16)	25.08 (21.54–28.90)	24.76 (21.26–28.64)	24.98 (21.48–28.59)	25.32 (21.90–28.99)	24.50 (21.03–28.34)
Waist circumference								
Men	39.45 (33.83–45.29)	14.37 (10.72–18.70)	14.50 (10.85–18.81)	39.33 (33.76–45.11)	37.23 (31.53–42.87)	13.10 (9.62–17.32)	12.80 (9.23–16.77)	37.15 (31.52–42.73)
Women	75.58 (69.86–80.69)	56.93 (50.84–62.87)	57.50 (51.47–63.36)	75.58 (69.86–80.69)	74.48 (68.63–79.62)	56.17 (50.10–62.16)	56.59 (50.39–62.31)	74.38 (68.63–79.62)
Total	56.34 (52.08–60.52)	34.00 (30.20–37.97)	34.43 (30.64–38.37)	56.09 (51.86–60.25)	55.81 (51.54–59.98)	32.65 (28.89–36.59)	32.88 (29.20–36.85)	55.07 (50.78–59.19)

CI = confidence interval; AHA/NHLBI = American Heart Association and National Heart, Lung and Blood Institute; NCEP-ATP = National Cholesterol Education Program-Adult Treatment Panel; IDF = International Diabetes Federation.HDL = high-density lipoprotein.

Table 4 Risk factors for metabolic syndrome, Zahedan, 2017: logistic regression analysis

Variable	AHA criteria			Univariate analysis			Multivariable analysis		
	Metabolic syndrome, no. (%)	Non-metabolic syndrome, no. (%)	Total	OR (95% CI)	R^2	*P*	OR (95% CI)	R^2	*P*
Sex								***0.667***	***0.001***
Female	96 (35.0)	178 (65.0)	274	2.10 (1.44–3.05)	0.039	< 0.001	3.91 (1.78–8.59)		
Male	62 (20.4)	242 (79.6)	304	100 .			1.00		
Waterpipe smoking									***0.01***
Yes	11 (39.3)	17 (60.7)	28	1.77 (0.81–3.87)	0.005	0.16	6.08 (1.55–23.82)		
No	147 (26.7)	403 (73.3)	550	1.00			1.00		
Fasting blood sugar(mg/dL)									***< 0.001***
≥ 100	81 (59.6)	55 (40.4)	136	6.98 (4.58–10.64)	0.200	< 0.001	13.22 (6.74–25.94)		
< 100	77 (17.4)	365 (82.6)	442	1.00			1.00		
Triglycerides (mg/dL)									***< 0.001***
≥ 150	48 (65.8)	25 (34.2)	73	6.89 (4.06–11.68)	0.131	< 0.001	23.75 (9.92–56.84)		
<150	110 (21.8)	395 (78.2)	505	1.00			1.00		
Waist circumference (cm)									***< 0.001***
Men ≥ 94 Women ≥ 80	143 (44.4)	179 (55.6)	322	12.83 (7.28–22.60)	0.27	< 0.001	22.42 (9.03–55.70)		
Men < 94 Women < 80	15 (5.9)	241 (94.1)	256	1.00			1.00		
Blood pressure (mmHg)									***< 0.001***
≥ 130/85	81 (56.3)	63 (43.8)	144	5.96 (3.95–8.99)	0.176	< 0.001	16.91 (8.54–33.50)		
<130/85	77 (17.7)	357 (82.3)	434	1.00			1.00		
LDL cholesterol (mg/dL)[a]									***0.017***
> 140	21 (46.7)	24 (53.3)	45	2.52 (1.36–4.68)	0.021	0.004	3.47 (1.24–9.68)		
≤ 140	133 (25.7)	384 (74.3)	517	1.00			1.00		
Wrist circumference (cm)	mean (SD) 17.01 (1.68)	mean (SD) 16.53 (1.55)	578	1.20 (1.07–1.35)	0.026	0.001	1.29 (1.04–1.59)		0.01

AHA = American Heart Association; OR = odds ratio; CI = confidence interval; LDL = low-density lipoprotein; SD = standard deviation.

[a]*Data were missing for 16 people.*

contributes to the incidence of metabolic syndrome due to their high glycaemic load *(8,24)*.

Our results also showed that sex, waterpipe smoking, LDL cholesterol level and wrist circumference increased the risk of metabolic syndrome. As previously reported, sex hormones, such as androgen and estrogen play a determining role in the incidence of metabolic syndrome *(25)* because metabolic changes in women are associated with sex hormones both before and after menopause *(26)*. In addition, waterpipe smoking reduces blood HDL cholesterol and increases triglycerides, which contributes to the incidence of metabolic syndrome *(27)*. Moreover, LDL cholesterol causes insulin resistance and thus contributes to the incidence of metabolic syndrome *(28)*. The predictive role of wrist circumference in the incidence of metabolic syndrome can also be attributed to the relationship between this component and weight, body mass index, waist circumference, insulin resistance and LDL cholesterol level *(29)*. Other studies on the Iranian population have also reported a relationship between wrist circumference and metabolic syndrome *(29,30)*.

Our study has some limitations. First, the sample size was small and there was no annual follow-up of the target population. Despite these limitations, to the best of our knowledge, this study is the first of its kind conducted in this geographical region to measure the incidence of metabolic syndrome. Thus, our results can provide Iranian health policy-makers with useful information on the trend in metabolic syndrome.

Conclusion

Waist circumference, blood pressure, fasting blood sugar and triglycerides had the highest incidence rate of the components of metabolic syndrome, indicating inappropriate health-related behaviours, high-fat diets or low physical activity. Our results highlight the need for effective interventions to encourage people to adopt a healthy and safe diet, have more physical activity and modify their unhealthy behaviour (e.g. waterpipe smoking).

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Competing interests: None declared.

Incidence du syndrome métabolique et facteurs associés dans le sud-est de la République islamique d'Iran

Résumé

Contexte : Le syndrome métabolique est une cause importante de maladies cardiovasculaires. La mortalité imputable aux maladies cardiovasculaires est de 12,82 décès pour 100 000 habitants à Zahedan, dans le sud-est de la République islamique d'Iran.

Objectifs : La présente étude visait à déterminer l'incidence du syndrome métabolique ainsi que ses facteurs prédictifs dans la ville de Zahedan.

Méthodes : Toutes les personnes qui n'étaient pas atteintes de syndrome métabolique, ayant participé à une étude en 2009 à Zahedan et disponibles en 2017, ont été incluses dans la présente étude. Le syndrome métabolique a été diagnostiqué selon les critères de plusieurs organisations. Les indices anthropométriques et la tension artérielle ont été mesurés et des tests sanguins ont été effectués. L'incidence standardisée selon l'âge a été calculée pour le syndrome métabolique, et ses facteurs prédictifs ont été évalués dans une analyse de régression logistique.

Résultats : L'âge moyen (écart type) des participants était de 45,46 (12,63) ans en 2017. L'incidence du syndrome métabolique était comprise entre 17,21 % et 27,18 % selon les critères utilisés ; elle était plus élevée chez les femmes. Une incidence standardisée selon l'âge élevée était associée à un grand tour de taille (55,81 %) et à une hypertension artérielle (25,32 %). Les odds ratios (OR) ajustés les plus élevés pour le syndrome métabolique concernaient les participants qui avaient un taux de triglycérides élevé (OR = 23,75 ; intervalle de confiance [IC] à 95 % : 9,92-56,84 %), un grand tour de taille (OR = 22,42 ; IC à 95 % : 9,03-55,70 %), une hypertension artérielle (OR = 16,91 ; IC à 95 % : 8,54-33,50 %) et un taux de glycémie élevé à jeun (OR = 13,22 ; IC à 95 % : 6,74-25,94 %). Le tabagisme par pipe à eau, le sexe, les lipoprotéines de basse densité et la circonférence du poignet étaient également associés au syndrome métabolique.

Conclusions : L'incidence du syndrome métabolique a augmenté à Zahedan. Des interventions efficaces, notamment pour promouvoir une alimentation saine et l'activité physique et pour décourager l'usage de la pipe à eau, sont nécessaires afin de lutter contre cette affection.

معدل حدوث المتلازمة الاستقلابية والعوامل المرتبطة بها، جنوب شرق جمهورية إيران الإسلامية

خديجة فرمانفارما، علي-رضا أنصاري-مقدم، محمود كيخاي، مهدي محمدي، حسين عُدَينة، حسن علي- عبد

الخلاصة

الخلفية: تعتبر المتلازمة الاستقلابية سببًا مهمًا لأمراض القلب والأوعية الدموية. ويبلغ معدل الوفيات الناجمة عن أمراض القلب والأوعية الدموية 12.82 وفاة لكل 100000 نسمة في زاهدان، جنوب شرق جمهورية إيران الإسلامية.

الأهداف: هدفت هذه الدراسة إلى تحديد معدل حدوث المتلازمة الاستقلابية والعوامل التي تنبئ بها في مدينة زاهدان.

طُرق البحث: أُدرج في هذه الدراسة جميع الذين شاركوا في دراسة أجريت عام 2009 في زاهدان وأُتيحت في عام 2017 ممن لا يعانون من المتلازمة الاستقلابية. وشُخِّصت المتلازمة الاستقلابية بناءً على معايير تطبقها عدة منظمات. وقيست مؤشرات القياسات الأنثروبومترية وضغط الدم وأُجريت اختبارات الدم. وحُسب معدل الحدوث المعياري حسب العمر للمتلازمة الاستقلابية وقُيِّمت عوامل التنبؤ بها في تحليل الانحدار اللوجستي.

النتائج: بلغ متوسط عمر المشاركين (الانحراف المعياري) 45.46 عامًا (12.63) في عام 2017. وتراوحت نسبة الإصابة بالمتلازمة الاستقلابية بين 17.21٪ و27.18٪ حسب المعايير المستخدمة، وكانت أعلى في صفوف النساء. وارتبط ارتفاع معدل الحدوث المعياري حسب العمر بضخامة محيط الخصر (55.81٪) وارتفاع ضغط الدم (25.32٪). وتمثلت أعلى نسب الأرجحية المُصحَّحة للمتلازمة الاستقلابية في الدهون الثلاثية المرتفعة (نسبة أرجحية = 23.75؛ فاصل ثقة 95٪: 9.92 – 56.84)، ومحيط الخصر الكبير (نسبة أرجحية = 22.42؛ فاصل ثقة 95٪: 9.03 – 55.70)، وارتفاع ضغط الدم (نسبة أرجحية = 16.91؛ فاصل ثقة 95٪: 8.54 – 33.50) وارتفاع نسبة السكر في الدم أثناء الصيام (نسبة أرجحية = 13.22؛ فاصل ثقة 95٪: 6.74 – 25.94). كما ارتبط تدخين الشيشة، والجنس، والليبوبروتين المنخفض الكثافة، ومحيط الخصر بالمتلازمة الاستقلابية.

الاستنتاجات: ارتفعت نسبة الإصابة بالمتلازمة الاستقلابية في زاهدان. وتمسُّ الحاجة إلى إجراء تدخلات فعالة لمكافحة تلك الحالة، بحيث تشمل تعزيز النظام الغذائي الصحي، والنشاط البدني، وتجنب تدخين الشيشة.

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