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Brief Report

Prevalence of Type 2 Diabetes, Obesity, Central Obesity, and Metabolic Syndrome in a South Coastal Region, Iran, the PERSIAN Bandare Kong Cohort Study: A Brief Report

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Abstract

Background: There has been no recent estimate of non-communicable diseases (NCDs) in south of Iran. Our data are based on the results of the population-based Bandare Kong Cohort Study, as part of the Prospective Epidemiological Research Studies in IrAN (PERSIAN).

Methods: In this cohort, 4063 people aged 35-70 years were recruited from Hormozgan province, South of Iran.

Results: We found that the age-standardized prevalence (ASP) of metabolic syndrome (MetS), type 2 diabetes (T2DM), impaired fasting glucose (IFG), obesity, and central obesity in this population were 34.5%, 17.4%, 20.6%, 24.6%, and 44.4%, respectively.

Conclusion: These results give a new insight into the prevalence of the NCDs in a sample population from south of Iran and provide the authorities with the necessary information to design guidelines for the control and prevention of these diseases.

Keywords: non-communicable diseases, Prospective Epidemiological Research Studies in IrAN (PERSIAN)

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Background

Non-communicable disease (NCDs) are by far the leading cause of death worldwide. In 2016, they accounted for more than 70% equal to 41 million deaths globally (1). In 2016, the odds of death from a major NCD was 18% (2). The current burden of NCDs in different countries has been a guide for the management of their preventable risk factors. In this study we aimed to determine the prevalence of metabolic syndrome (MetS), diabetes, impaired fasting glucose (IFG), obesity, and central obesity in the PERSIAN Bandare Kong Cohort study.

Methods

We evaluated participants of the PERSIAN Bandare Kong Cohort Study, a prospective, population-based cohort study in Bandare Kong, Iran, which has been previously described in detail (3). This cohort study includes 4063 individuals aged 35-70 years, recruited between November 17, 2016 and November 22, 2018 from Hormozgan province, southern Iran.

Patients' data including weight, height, waist circumference (WC), body mass index (BMI), fasting plasma glucose (FPG), serum high-density lipoprotein, and triglyceride were extracted. WC ≥95 cm was considered as central obesity in the Iranian population for both men and women (4), BMI ≥30 kg/m^2 as obese based on the WHO guidelines, FPG ≥126 mg/dL or consumption of glucose lowering agents as type 2 diabetes (T2DM) and 100≤FPG<126 mg/dL as IFG based on the American Diabetes Association criteria, and MetS based on the Iranian National Committee of Obesity criteria.

Results

The age-standardized prevalence (ASP) of diabetes was the highest in women aged 60-64 years. Furthermore, the ASP of IFG was 20.6 with the highest prevalence among men aged 50-54 years. Diabetes was more prevalent in women of all age groups; however, IFG was more prevalent in men across all age groups, except for those aged 65-70 years, among which ASP of IFG was higher in women (Table 1). Men aged 35-39 years had higher ASP of MetS compared to women of this age group; nevertheless, the ASP of MetS was higher in women of all other age groups. The ASP of obesity and central obesity were the highest in women aged 50-54 years and both more prevalent in women across all age-groups.

Discussion

In this recent report of the burden of NCDs in south of Iran, we found a much higher prevalence of T2DM

Table 1. Crude and Age-Standardized Prevalence of NCDs

NCDs	Age Categories (y)	Total Population		Men	Women
		Crude % (95 % CI)	ASP % (95 % CI)	ASP % (95 % CI)	ASP % (95 % CI)
	35-39	20.9 (18.4-23.7)	21.1 (19.2-22.9)	23.5 (19.4-27.7)	18.8 (15.4-22.2)
	40-44	27.9 (24.7-31.2)	27.7 (25.4-30.1)	26.1 (21.3-30.9)	29.2 (24.8-33.6)
	45-49	32.3 (28.8-35.9)	31.7 (29.2-34.2)	24.6 (19.6-29.7)	37.9 (33.1-42.8)
MetS	50-54	44.4 (40.3-48.7)	43.5 (40.5-46.4)	34.3 (27.9-40.6)	51.1 (45.7-56.5)
	55-59	52.8 (48.4-57.1)	51.7 (48.6-57.8)	39.6 (32.9-46.3)	62.1 (56.6-67.7)
	60-64	54.2 (49.0-59.3)	54.1 (50.4-57.7)	48.1 (40.8-55.3)	60.3 (53.2-67.5)
	65-70	55.5 (49.1-61.7)	54.7 (50.3-59.3)	45.6 (36.0-55.3)	62.9 (54.8-71.1)
Total		36.6 (35.1-38.1)	34.5 (33.1-35.9)	30.1 (27.9-32.3)	37.6 (35.8-39.5)
	35-39	6.6 (5.1-8.4)	6.6 (5.4-7.7)	6.3 (3.9-8.7)	6.8 (4.6-9.0)
	40-44	9.9 (7.9-12.3)	9.9 (8.3-11.4)	9.2 (6.0-12.4)	10.4 (7.5-13.4)
	45-49	16.7 (14.1-19.7)	16.4 (14.4-18.4)	12.3 (8.5-16.1)	19.9 (16.0-23.9)
Diabetes	50-54	24.9 (21.4-28.7)	24.5 (22.0-27.1)	21.4 (15.9-26.9)	27.1 (22.3-31.9)
	55-59	33.3 (29.3-37.6)	32.7 (29.8-35.6)	26.1 (20.1-32.1)	38.4 (32.9-44.1)
	60-64	33.7 (29.3-38.7)	33.6 (30.2-37.0)	28.0 (21.5-34.5)	39.3 (32.3-46.4)
	65-70	37.2 (29.3-38.7)	36.7 (32.4-41.1)	30.0 (21.2-39.1)	42.6 (34.3-51.1)
Total		19.2 (18.0-20.5)	17.4 (16.3-18.5)	14.5 (13.0-16.1)	19.6 (18.1-21.1)
	35-39	16.4 (14.1-19.0)	16.7 (15.0-18.5)	21.0 (17.0-25.0)	12.8 (9.9-15.7)
	40-44	21.2 (18.4-24.3)	21.3 (19.2-23.4)	22.9 (18.2-27.5)	19.9 (16.0-23.8)
	45-49	20.7 (17.8-24.0)	20.9 (18.7-23.1)	22.5 (17.7-27.4)	19.4 (15.5-23.4)
IFG	50-54	25.8 (22.3-29.6)	26.2 (23.5-28.8)	29.8 (23.7-35.9)	23.2 (18.7-27.7)
	55-59	24.0 (20.4-27.9)	24.1 (21.4-26.8)	25.6 (19.7-31.5)	22.8 (18.0-27.6)
	60-64	22.5 (18.5-27.0)	22.5 (19.5-25.5)	24.2 (18.0-30.4)	20.8 (14.9-26.6)
	65-70	20.1 (15.5-25.7)	20.0 (16.4-23.6)	19.4 (11.8-27.1)	20.6 (13.8-27.4)
Total		21.1 (19.8-22.4)	20.6 (19.4-21.9)	23.3 (21.3-25.3)	18.6 (17.0-20.2)
	35-39	27.1 (24.3-30.1)	26.8 (24.7-28.8)	22.0 (17.9-26.1)	31.1 (27.1-35.2)
	40-44	24.2 (21.2-27.4)	23.8 (21.6-25.9)	18.2 (13.9-22.4)	28.8 (24.4-33.2)
	45-49	25.1 (22.0-28.5)	24.3 (22.1-26.6)	14.8 (10.7-18.9)	32.7 (28.0-37.4)
Obesity	50-54	26.2 (22.6-30.0)	24.9 (22.3-27.4)	12.7 (8.2-17.2)	34.9 (29.7-40.0)
	55-59	25.2 (21.6-29.2)	24.3 (21.7-26.9)	14.5 (9.7-19.3)	32.8 (27.4-38.1)
	60-64	17.3 (13.7-21.5)	17.2 (14.5-20.1)	11.7 (7.1-16.4)	22.9 (16.7-29.1)
	65-70	16.9 (12.6-22.2)	16.3 (13.0-19.6)	8.8 (3.3-14.3)	23.1 (15.9-30.1)
Total		24.3 (23.0-25.7)	24.6 (23.3-26.0)	16.8 (14.9-18.6)	30.5 (28.6-32.4)
	35-39	39.1 (36.0-42.3)	39.1 (36.7-41.3)	37.2 (32.4-42.1)	40.6 (36.3-44.9)
	40-44	44.0 (40.4-47.6)	43.4 (40.8-45.9)	35.0 (29.8-40.3)	50.9 (46.0-55.7)
	45-49	45.0 (41.4-48.8)	43.8 (41.1-46.4)	28.5 (23.3-33.8)	57.1 (52.2-62.1)
Central obesity	50-54	49.4 (45.2-53.7)	47.8 (44.9-50.8)	32.9 (26.6-39.2)	60.2 (55.0-65.5)
	55-59	51.2 (46.8-55.6)	49.7 (46.7-52.8)	33.3 (26.9-39.8)	63.8 (58.3-69.3)
	60-64	46.1 (41.0-51.3)	46.0 (42.4-49.6)	34.8 (27.9-41.7)	57.5 (50.3-64.8)
	65-70	46.1 (41.0-51.3)	45.7 (41.3-50.1)	33.0 (23.9-42.1)	57.0 (48.7-65.4)
Total		45.1 (43.5-46.6)	44.4 (42.9-46.0)	52.2 (50.1-54.2)	34.1 (31.8-36.4)

Abbreviations: MetS, metabolic syndrome; ASP, age-standardized prevalence; NCD, non-communicable disease; IFG, impaired fasting glucose; CI, confidence interval.

(17.4%) compared to the 9.3% global estimate in 2019 and the overall 9.6% age-adjusted prevalence of diabetes in Iran (5). The noticeable difference can be attributed to the specific dietary pattern, life style, and living conditions of the population of Bandare Kong.

In our study, the ASP of IFG was 20.6%. Prediabetes is defined as the presence of IFG or impaired glucose tolerance (IGT). The global and regional prevalence of IGT were estimated as 7.5% and 8.3% in 2019 (5).

We found a 24.6% ASP of obesity in our study, with 16.8% ASP in men and 30.5% in women. In a recent multicohort study of the European population including 120,181 participants, 9.9% of men and 10% of women were obese (6). Moreover, the total prevalence of obesity was 26.5% in a report from southwest of Iran (7) which is similar to our findings.

The prevalence of MetS ranges from <10% to as high as 84% around the world (8). The ASP of MetS in this study was 34.5%, quite similar to 30.4% in adults over 20 years, reported in a recent meta-analysis of Iranian studies (9).

Conflict of interests

The authors declare that they have no competing interests.

Ethical Approval

The cohort study was given ethical approval by the Ethics Committee of Hormozgan University of Medical Sciences.

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