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Fast Food Chains and Obesity in Oman: Commentary Article

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Abstract

Introduction: Fast food chains are a global phenomenon, and they have been associated with less successful weight loss maintenance, undesirable weight gain, a higher Body Mass Index (BMI). Some have defined fast food as pre packed meals or ready to eat convenience food, and others have described fast food as food purchased from a major franchised chain. Higher rates of fast food consumption have been connected with increasing rates of obesity.

Materials and methods: Colorectal Cancer (CRC) patients treated at Royal Hospital were identified from Royal Hospital medical records and from Oman's cancer registry between 2000 and 2013.

Results: The total number of patients diagnosed with CRC was 492, and the BMI information of 351 patients was available. In Oman, most fast food restaurants are situated in the Muscat region (40 restaurants) followed by Sohar (seven restaurants), Salalah (four restaurants), and Nizwa (two restaurants). The obesity, BMI, and CRC malignancy rates were higher in the areas with fast food chains (with the exception of Sohar). The CRC age standardized rate was lower in the areas with no fast food outlets, and the incidence of obesity and CRC were also lower. In our study, the proportion of those who were overweight or obese was 65.2% in Muscat, 81.5% in Salalah, 62.5% in Sohar, and 50% in Buraimi. In other regions with no available fast food outlets, the rate of obesity ranged from 33.3% to 47.4%.

Conclusion: There was a strong association between obesity, fast food chain availability and CRC. High fish intake might have a protective effect on the development of CRC. Although Sohar had a high obesity rate and a good number of fast food chains, the region had a low CRC incidence possibly attributable to high fish intake.

Keywords

Colorectal cancer; Obesity; Fast food chains; Body mass index

Introduction

Fast food chains are a global phenomenon, and they have been associated with less successful ideal weight maintenance, weight gain and a higher body mass index or BMI [1,2]. Some have defined fast food as pre packed meals or ready-to-eat convenience food, and others have described fast food as food purchased from a major franchised chain [3,4]. Some mechanisms that could explain the link between the consumption of fast food and increased obesity risk are large food portions, excessive amounts of refined starch with added sugars and a subsequent high glycaemic load [5]. The most likely mechanism is the energy (calorie) density of fast food; excess caloric intake is a well-established determinant for weight gain [5-7].

Fast food offers unwholesome choices, particularly for children and teenagers, by elevating their risk of obesity due to bulky portion sizes, excess fat and sugar, straightforward starches, excess salt, higher food density and high caloric values [2]. An individual could easily take in 1,500 calories from a single fast food meal. A typical fast food menu includes a burger containing "850 calories" and 25 grams of fat and French fries containing 350 calories and 20 grams of fat [2]. Wendy's Bacon Deluxe Double Burger contains 880 calories and 52 g of fat, and Taco Bell's Nachos Bell Grande contains 770 calories and 24 g of fat. A medium-sized order of fries at McDonald's contains 380 calories and 19 g of fat, onion rings at Dairy Queen contain 360 calories and 16 g of fat, and regular coleslaw at Popeye's contains 260 calories and 23 g of fat. A large Frosty at Wendy's contains 540 calories and 8 g of fat, and an iced caramel latte from Dunkin' Donuts contains 450 calories and 12 g of fat [2].

Higher rates of fast food consumption have been connected with increasing rates of severe obesity. Morbid and super morbid obesity rates are growing at a more advanced pace than the rates of moderate obesity [8]. The consumption of takeaway and fast food is becoming more popular among children and adolescents in developing countries [9]. The relevant factors for the preference of fast food include the food's good taste, easy accessibility, increased convenience, and pocket-friendly nature [10].

Studies have shown that consuming food away from home is an important cause of increased obesity risk [11-15]. The presence of convenience stores within a 10-minute walking distance of schools was associated with a higher rate of overweight students than schools without nearby convenience stores [16]. A fast food restaurant within 0.1 miles of a school resulted in a 5.2% increase in obesity rates as described by Currie et al [17]. Among pregnant women, a fast food restaurant within 0.5 miles of her residence results in a 1.6% increase in the probability of gaining over 20 kg weight during her pregnancy [17].

Fast food consumption was a significant determinant of high BMI in females, and both fast food and eating at restaurants predicted high BMI in males as well when controlling for other factors known to affect obesity, such as demographics, lifestyle, and location [14,18].

A fast food supplier's goal is to minimize time costs or to maximize the convenience of consumers. A key component of costs is the time and distances customers spend traveling to and from a fast food outlet [19,20]. Opening new stores (increasing fast food chain density) decreases the distance consumers need to travel, lowering the real price of the meal, increasing the ease of access and the quantity demanded will increase [19,20].

Materials and Methods

The National Oncology Center (NOC) is the only comprehensive oncology center in Oman; more than 70% of all newly diagnosed patients are treated at the NOC. This study was conducted after receiving the ethical approval of the Royal Hospital's ethical committee. Eligible patients were identified from both Royal Hospital electronic medical records and the Oman cancer registry. All patients were diagnosed with Colorectal Cancer (CRC) between 1998 and 2012 and were treated at the Royal Hospital. The database included patients who were diagnosed with pathological stage I, II, III, or IV CRC at the Royal Hospital during this period were included in this study. Patients also must have had their baseline height and weight prospectively recorded at their initial consultation visit prior to their receipt of any systemic chemotherapy or radiation therapy if any had been given. We included patients who developed a recurrence or death even if this development occurred shortly after their original diagnosis of CRC.

BMI was used as the measure of obesity. BMI was calculated as the patient's weight (in kilograms) divided by the patient's height squared (in square meters). Patients were subsequently assigned to four BMI categories: underweight (<18.5 kg/m2), normal (18.5-24.9 kg/m2), overweight (25-29.9 kg/m2), or obese (>30 kg/m2).

The patients were evaluated for age, gender, disease characteristics (tumor grade, location, and disease stage), receipt of systemic chemotherapy or radiation, and type of regimen received.

Multiple regression analysis was carried out to examine which risk factors predicted CRC. Logistic regression was conducted to estimate the associations between food intake, level of physical activity, presence of metabolic syndrome with both cancers, and BMI. Data was analyzed using the SPSS Statistics Version 20.

Results

In total, 492 patients were diagnosed with CRC during the period of the study, and the BMI data of 351 patients was available.

In Oman, most fast food chains are situated in the Muscat region; for instance, 14 out of 21 McDonalds are located in Muscat (66.6%), three are located in Sohar (14%), two are located in Salalah (9.5%), and one is located in Nizwa and Buraimi (4.7% each). Of the 21 KFC outlets, 14 are located in Muscat (66.6%); three are located in Sohar (14.3%); and one is located in Nizwa, Salalah, and Buraimi. For Burger King, seven out of eight outlets are located in Muscat (87.5%) and one is located in Sohar (12.5%), and for Hardees, seven out of eight branches are located in Muscat (87.5%) and one is located in Salalah (12.5%). The "obesity rates" and colon malignancy rates are high in these areas; while in areas with no fast food outlets, the percentage of obesity is much lower. In our study, the proportion of overweight and obese subjects was 65.2% in Muscat, 81.5% in Salalah, 62.5% Sohar, and 50% in Buraimi. In other regions with no fast food outlets, the percentage of obesity ranged between 33.3% and 47.4% **(Tables 1 and 2) (Figures 1 and 2).**

Muscat

Total number of patients: 115, median age: 49 years, mean age: 49.1 years, range: 23-80 years, mean BMI: 27, median BMI: 26

- Normal and underweight: 40 patients (34.8%), obese and overweight: 75 patients (65.2%)
- Stage I: 10 (8.7%), stage II: 22 (19.1%), stage I and II: 27.8%
- Stage III: 38 (33%), stage IV: 35 (30.1%), stage III and IV: 63.1%
- Unknown stage: 10 (8.7%)

Salalah

Total number of patients: 27, median age: 52 years, mean age: 50.2 years, range: 27–72 years, median BMI: 27.8, mean BMI: 29.2

- Normal and underweight: 5 patients (18.5%), obese and overweight: 22 (81.5%)
- Stage I: 4 (14.8%), stage II: 4 (14.8%), stage I and II: 29.6%
- Stage III: 11 (40.8%), stage IV: 5 (18.5%), stage III and IV: 59.3%
- Unknown stage: 3 (11.1%), Diabetes Mellitus: 2 (7.7%), normal: 24 (92.3%), unknown: 0

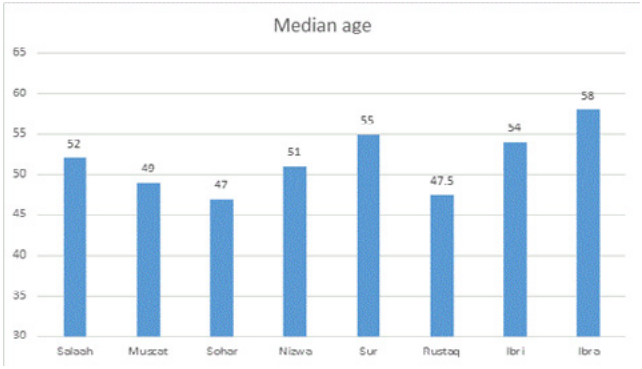

Figure 1: Median age of the patients in each region.

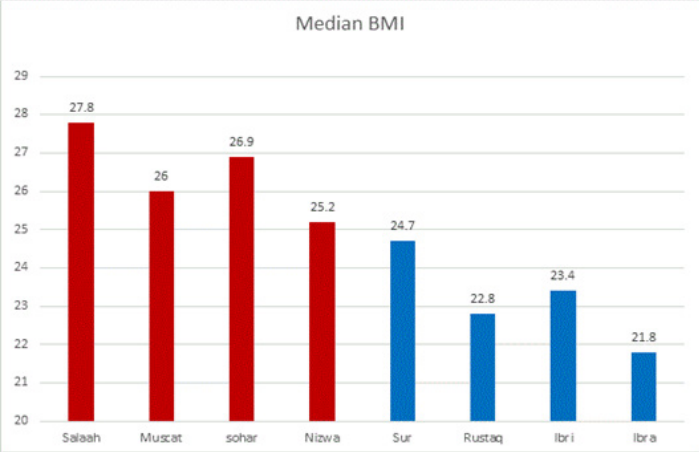

Figure 2: Median body mass index (BMI) of the patients in each region.

-	Number			Number	Percentage	CRC ASR 2012
Salalah	26	Median age (Years)		52		7.9
		Mean age		50.2		
		Median BMI		27.8		
		Mean BMI		29.2		
		Normal or underweight		5	18.50%	
		Overweight or obese		22	81.50%	
		DM	Yes	2	7.70%	
			No	24	92.30%	
			Unknown	0	0	
Muscat	115	Median age		49		8.7
		Mean age		49.1		
		Median BMI		26		
		Mean BMI		27		
		Normal or underweight		40	34.80%	
		Overweight or obese		75	65.20%	
		DM	Yes	26	22.60%	
			No	85	73.90%	
			Unknown	4	3.50%	
Sohar	48	Median age		47		8.7
		Mean age		47.3		
		Median BMI		26.9		
		Mean BMI		27.3		
		Normal or underweight		18	37.50%	
		Overweight or obese		30	62.50%	
		DM	Yes	6	12.50%	
			No	41	85.40%	
			Unknown	1	2.10%	
		Median age		51		
		Mean age		50.4		
		Median BMI		25.2		
		Median age		25.3		

Nizwa	42	Normal or underweight		21	50%	3.4
		Overweight or obese		21	50%	
		DM	Yes	5	11.90%	
			No	36	85.70%	
			Unknown	1	2.40%	
Sur	19	Median age		55		4.7
		Mean age		53.6		
		Median BMI		24.7		
		Mean BMI		26.1		
		Normal or underweight		10	52.60%	
		Overweight or obese		9	47.40%	
		DM	Yes	1	5.30%	
			No	18	94.70%	
			Unknown	0		
Rustaq	26	Median age		47.5		5.1
		Mean age		48.9		
		Median BMI		22.8		
		Median BMI		24.6		
		Normal or underweight		15	57.70%	
		Overweight or obese		11	42.30%	
		DM	Yes	3	11.50%	
			No	21	80.80%	
			Unknown	2	7.70%	
Ibri	12	Median age		54		3.4
		Mean age		53		
		Median BMI		23.4		
		Median age		24.6		
		Normal or underweight		7	58.30%	
		Overweight or obese		5	41.70%	
		DM	Yes	1	8.30%	
			No	11	91.70%	
			Unknown	0		
Ibra	21	Median age		58		3.4
		Mean age		54.4		
		Median BMI		21.8		
		Mean BMI		23.5		
		Normal or underweight		14	66.70%	
		Overweight or obese		7	33.30%	
		DM	Yes	3	14.30%	
			No	18	85.70%	
			Unknown	0		

Table 1: Regional Data.

Regions	-		Number of fast food restaurants	CRC ASR 2012
Salalah	Median BMI	27.8	4	7.9
	Overweight or obese	81.50%		
Muscat	Median BMI	26	40	8.7
	Overweight or obese	65.20%		
Sohar	Median BMI	26.9	7	3.8
	Overweight or obese	62.50%		
Nizwa	Median BMI	25.2	2	3.4
	Overweight or obese	50%		
Sur	Median BMI	24.7	0	4.7
	Overweight or obese	47.40%		
Rustaq	Median BMI	22.8	0	5.1
	Overweight or obese	42.30%		
Ibri	Median BMI	23.4	0	3.4
	Overweight or obese	41.70%		
Ibra	Median BMI	21.8	0	3.4
	Overweight or obese	33.30%		

Table 2: Fast food chains and obesity.

Discussion

The Sultanate of Oman has the highest incidence of CRC in the Gulf region. Most of these incidences have been attributed to changing eating habits and lifestyle, socioeconomic factors, low consumption of dietary fiber, and undesirable weight gain. Changes in lifestyle and diet habits have been linked to increased urbanization and globalization. High-fat, calorie-dense food and processed foodstuff are becoming increasingly common among the Omani population, with children and adolescents being the greatest victims of unhealthy feeding habits. The majority of urban residents, especially working-class residents, have become addicted to junk foods. These changes have prompted the Omani government to take the necessary measures to arrest the situation due to the ubiquity of non-communicable ailments attributed to bad eating habits.

In May 2009, the Department of Nutrition of the Ministry of Health released healthy eating guidelines. These guidelines were part of the government's widespread effort to combat malnutrition and micronutrient deficiency among the Omani population and to fight obesity and non-communicable diseases. Despite publishing these guidelines nearly six years ago, the unhealthy dietary trend has not changed. Most are still consuming inundated, processed, greasy foods; fast foods, and high energy foods instead of nutrient-rich foodstuff, such as vegetables and fresh fruits.

For this reason, increased public awareness is necessary to avert a greater increase in obesity and morbidity rates. Awareness can be defined as an understanding of the undertakings of others, and this understanding offers a standpoint for one's own undertakings. Increased public awareness is necessary for the development of healthy eating habits and the prevention of non-communicable diseases, such as CRC. Increased public awareness can also help eliminate the retrogressive sociocultural practices in Oman that promote bad dietary habits and increased risk of obesity. These retrogressive cultural practices also include practices that promote gender separation and restrict women's movement. Moreover, the southerners who regard corpulence as a symbol of health and affluence should be made aware of the dangers associated with obesity.

A deliberate effort should be made to promote indigenous food crops, which are rich in dietary fiber. Studies have shown that food that is rich in dietary fiber enhances fecal mass and therefore speeds up the peristalsis process and minimizes the period of exposure to carcinogenic elements. The government should also increase the production of fiber-rich foods such as bran, crispy vegetables, rye powder, cereals produced from wheat bran, whole wheat or grain products, grains, and dried flour paste made from whole wheat. Fiber-rich foods combat carcinogenic elements in the body. These foods provide an all-inclusive range of cancer-repellant plant compounds or phytochemicals. In addition, food availability and accessibility should be enhanced. Food scarcity attributed to socioeconomic disparity plays a huge role in the development and progression of CRC. Lastly, the government should promote the Bedouin way of life, which promotes the consumption of healthy, traditional foods.

Our study has indicated that the regional BMI variation in Oman, with the highest median BMI being found in Salalah (27.8) and the lowest median BMI being found in Ibra (21.8). The people classified as underweight accounted for 5.4% of the population, people classified as normal weight accounted for 37.3% of the population, and the combination of those who were normal or underweight accounted for 42.7% of the population. According to the defined criteria, the overweight subjects accounted for 33.6% of the population, the obese subjects accounted for 23.6% of the population, and the combination of those who were overweight or obese accounted for 57.3% of the population. The highest and lowest proportions of those who were underweight or of a normal weight were from Ibra (66.7%) and Salalah (18.5%), respectively. More than half of the population was overweight or obese in Salalah, Muscat, Sohar,

and Nizwa and less than half of the population was overweight or obese in Sur, Rustaq, Ibri, and Ibra. In another study that examined the demographics of colorectal cancer patients in Oman, those who were underweight and of a normal weight accounted for 41.3% of the population, and those who were obese or overweight accounted for 35.2% of the population [21].

Obesity has become a global epidemic in last few decades. In the US, over 30% of the population is overweight and obese, while in the UK, obesity is believed to be the second most common cancer risk factor after smoking [22]. Obesity is related to many cancers, like CRC, breast, gynecological, and hepatocellular cancer. The CRC-obesity relationship is reinforced by the role of nutrition in CRC. Thus, CRC has been associated with red and processed meat intake. A dietary pattern based on high carbohydrate intake and high sugar content beverages after CRC diagnosis might increase the risk of recurrence and mortality after the initial diagnosis. High BMI has been associated with a significantly high risk of CRC with no or weak expression of fatty acid synthase and β catenin-negative colonic tumors. Visceral adipose tissue (Fat deposited in organs) is widely acknowledged to be a risk factor for CRC that could be easily quantified by computerized tomography and has been identified as a risk factor for colorectal adenomas. Obesity sets in mutagenesis, metabolic deregulation, and exaggerated inflammatory responses, facilitating the pathogenesis of CRC.

The early diagnosis of obesity is crucial since obesity is an increasingly “acknowledged” CRC risk factor. Other lifestyle factors that are associated with obesity that might increase CRC risk are physical inactivity, smoking and high alcohol intake.

Conclusion

There is strong association between obesity, CRC, and fast food chain availability. Sohar, despite its high obesity rate and number of fast food chains, had a relatively low CRC incidence. High fish intake might have a protective effect against the development of CRC in this coastal area.

References

1. Obesity Action Coalition (22 Sep, 2016) Fast food – Is it the enemy?
2. Fraser LK, Clarke GP, Cade JE, Edwards KL (2012) Fast food and obesity: A spatial analysis in a large United Kingdom population of children aged 13-15. American J Prev Med 42: e77-85.
3. Harrison K, Marske AL (2005) Nutritional content of foods advertised during the television programs children watch most. American J Pub Heal 95: 1568-1574.
4. Pereira MA, Kartashov AI, Ebbeling CB, Van Horn L, Slattery ML, et al. (2005) Fast-food habits, weight gain, and insulin resistance (the CARDIA study):15-year prospective analysis. Lancet 365: 36-42.
5. Ludwig DS (2002) The glycemic index: Physiological mechanisms relating to obesity, diabetes, and cardiovascular disease. JAMA 287: 2414-2423.
6. Orlet Fisher J, Rolls BJ, and Birch LL (2003) Children’s bite size and intake of an entree are greater with large portions than with age-appropriate or self-selected portions. American J Clin Nutri 77(5): 1164-1170.
7. Stender S, Dyerberg J, Astrup A (2007) Fast food: Unfriendly and unhealthy. International J Obes (London) 31: 887-890.
8. Garcia G, Sunil TS, Hinojosa P (2012) The fast food and obesity link: Consumption patterns and severity of obesity. Obesity Surgery.8.
9. Reidpath DD, Burns C, Garrard J, Mahoney M, Townsend M (2002) An ecological study of the relationship between social and environmental determinants of obesity. Health and Place 8: 141-145.
10. Munmun Shabnam Bipash, Shatabdi (2013) Good fast food preferences and food habits among students of private universities in Bangladesh. South East Asia J Pub Heal 3: 61-64.
11. Ebbeling CB, Garcia-Lago E, Leidig MM, Seger-Shippee LG, Feldman HA, et al. (2007) Altering portion sizes and eating rate to attenuate gorging during a fast food meal: Effects on energy intake. Pediatrics 119: 869-875.
12. Ebbeling CB, Sinclair KB, Pereira MA, Garcia-Lago E, Feldman HA, et al. (2004) Compensation for energy intake from fast food among overweight and lean adolescents. JAMA 291: 2828-2833.
13. French SA, Harnack L, Jeffery RW (2000) Fast food restaurant use among women in the pound of prevention study: Dietary, behavioral and demographic correlates. International J Obes Rel Mb Dis 24: 1353-1359.
14. Binkley JK, Eales J, Jekanowski M (2000) The relation between dietary change and rising US obesity. International J Obes Rel Mb Dis 24: 1032-1039.
15. Pereira MA, Kartashov AI, Ebbeling CB, Van Horn L, Slattery ML, et al. (2005) Fast-food habits, weight gain, and insulin resistance (the CARDIA study): 15-year prospective analysis. Lancet 365: 36-42.
16. Howard PH, Fitzpatrick M, Fulfrost B (2011) Proximity of food retailers to schools and rates of overweight ninth grade students: An ecological study in California. BMC Public Health.68.
17. Janet Currie, Stefano Della Vigna, Enrico Moretti, Vikram Pathania. Do fast food restaurants contribute to obesity?
18. K Dunn (2008) Fast-food consumption application and extension of the theory of planned behaviour to incorporate affective responses and implicit associations.
19. Jekanowski M, Binkley JK, Eales J. Convenience accessibility and the demand for fast food. JARE 26: 58-74.
20. Simon Hollands (2012) Association between the fast-food environment and obesity in Canada: A cross-sectional Analysis.
21. Shiyam Kumar, Ikram A Burney, Khawaja Farhan Zahid, Philomena Charlotte D Souza, Muna AL Belushi, et al. (2015) Colorectal cancer patient characteristics, treatment and survival in Oman-A single center study. Asian Pacific J Canc Pre 16: 4853-4858.
22. Javier Martinez, Jesus Garcia-Foncillas (2016) Obesity and colorectal cancer: Molecular features of adipose tissue. J of Trans Med.5.