ORIGINAL ARTICLE

Prevalence of menopause, chronic illnesses and life style of middle aged women in Karachi, Pakistan

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Abstract: *Objectives:* To determine the prevalence of menopause, chronic illnesses and lifestyle of middle aged women in Karachi, Pakistan. *Design:* A Cross Sectional survey was conducted among women of 40-60 years living in socio-economically different areas of Karachi. Information was gathered on their current menstrual status, age at menopause, body mass index, exercise habits, weekly recall of food consumed and chronic illnesses. These variables were also examined according to the socio economic status of the area where women reside. *Results:* A total of 1764 women in age group 40-60 years were interviewed. The prevalence of menopausal women in this age group was 39.3 percent (%). The mean age at menopause was 45.2 (±3.8) years. Only seven percent of women were doing some kind of exercise and approximately eighty percent had their Body Mass Index $\geq$ 23 kg/m^2 according to Asian Standard. Approximately 31 percent (%) of women reported eating any type of meat at least four times a week, of these most were from higher income area. Majority consumed meat less than three times a week. Similar pattern was observed for consumption of fruits and milk. Approximately 36 percent (%) of women reported diabetes mellitus, hypertension, cardio vascular heart disease and arthritis. *Conclusion:* The sedentary life style, obesity and chronic illnesses are highly prevalent and are serious emerging public health problem for 40-60 years old women of Karachi. We recommend that awareness about balanced diet, exercise and healthy eating habits should be inculcated in women early in life, where possible through schools and media. Health policies and public health messages should be formulated according to the various stages of life cycle of women, so that women can prepare themselves for the next stage of life.

Keywords: Women, Age, Lifestyle, Menopause, Karachi

Introduction

Most of the global burden of chronic illnesses in middle age group is borne by low and middle income countries. WHO estimates that 20-25 percent of global burden of disease is linked to lifestyle and behavior and by the year 2020, non-communicable diseases are expected to account for seven out of every ten deaths in the developing regions, compared with less than half today [1]. A study from Mexico carried out on 106 962 women aged ≥35 years, on self reported diagnoses of chronic diseases revealed that 26.9 percent had diabetes and another three percent had ischemic heart disease and 41percent of these women were obese. Physical inactivity was also highly prevalent [2]. A study from China has shown that middle age women who had healthy life style had lower mortality rates as compared to women who did not practice healthy life style [3].

Results from National Health Survey of Pakistan (1990-1994) suggested prevalence of overweight and obesity as 25 percent. The factors associated with being overweight and obese identified in this survey were older age, female gender, urban resident, literate, high economic status and a high intake of meat. Same group of researcher also identified that 25 percent middle-aged adults in Karachi suffer from coronary artery disease (CAD). The overall prevalence of CAD from this study was 26.9 percent; men (23.7%) and women (30%) [4].

Pakistan National Diabetic Survey indicates the prevalence of diabetes in women in urban areas as three and a half percent. For the age category of 35-64 year the prevalence was slightly higher (4.38%). The prevalence of impaired Glucose tolerance (IGT) in urban

women was 14.2 percent, however this increased to 15.2 percent for age group 35-64 years. The overall prevalence of abnormal glucose tolerance (IGT + DM) in women was 20.5 percent [5]. The current life expectancy for women in Pakistan is 65 years [6]. Women now expect to live one-third of their adult lives beyond menopause. The advancing age and menopausal status increase the risk of women to develop osteoporosis and cardiovascular diseases. This is because as estrogen levels decline in menopausal women, bone mass starts to decrease and lipid profiles begin to change adversely. Other medical conditions, such as hypertension and diabetes also become more prevalent in menopausal women [7-10]. Our objective was to determine the prevalence of menopause, chronic illnesses and lifestyle of middle aged women in the age group of 40-60 years living in Karachi. These factors were also examined according to the socio economic status of the area they reside.

Material and Methods

A community based cross-sectional survey was conducted in Karachi among women 40-60 years. We excluded women above 60 years of age because of the assumption of self-restricted mobility due to advanced age. The women were enrolled from socioeconomically different areas of Karachi. Bilal colony and Azambasti represented lower income (LIA) and PECHS-1 represented middle and high income areas (MHIA). Bilal colony has a population of approximately 67,000 and Azambasti 50,000, with monthly household income equivalent to 120 dollars in Bilal colony to 200 US $ in Azambasti. PECHS I has a population of approximately 66,000 with monthly income ranging from $500-$2000. The Gross National Income per capita for Pakistan for 2008 was estimated as $ 950.

Sample size was estimated by keeping the design effect as two percent, confidence level of 95 percent, expected prevalence of menopause, diabetic and obese women ranging from 10 to 20 percent and the precision/bond of error as two percent. By taking the refusal rate as 13 percent, the final estimated sample size was 1955 women, rounded off to 1960 women. This sample was equally divided amongst the three sites i.e. 653 subjects from each area. In each area, systematic sampling technique was used to identify the

households. A central area from each locality was identified; a house nearest to this locality served as the first random selection of a household, from there onwards every 3rd house was interviewed till sample size for that locality was completed. In case where a household with no women between age group 40–60 years was present, adjacent household was approached. If there were more than one woman in a household, one of them was selected randomly. Due to security issues in Karachi, we faced a high refusal rate in the initial period of data collection especially from independent bungalows from MHI area. However seeking permission for interviews was easy in an apartment building through the building administration. Since the socio-economic status of people living in apartments was not different than those living in independent houses, we decided that if an apartment building would fall under as n^{th} house then all the apartments of the building will be interviewed in high income area. Study PI developed pre-coded structured questionnaire in English. An expert translated this questionnaire into local language Urdu. A third person back translated Urdu version this into English to check the phrasing to ensure that that the sense of the questions was not changed. All the interviews were carried out in Urdu. A pre testing of the questionnaire was done on 5 % of the total sample size in communities other than the ones selected for the actual study. Trained female data collectors gathered the information on women's current age, education, monthly income, ethnicity, marital status, employment status, pregnancy history, age at menarche and menopause.

The Harris Benedict Formula [11] that combines both frequency and intensity of exercise was used to assess exercise habits of women. The exercise habits were divided into sedentary (little or no exercise), lightly active (light exercise/sports 1-3 days/week), moderately active (moderate exercise / sports 3-5 days/week), very active (hard exercise/ sports 6-7 days a week) and extra active (very hard exercise/sports & physical job) categories. Weight of women was measured in kilograms and height in meters. This information was later converted into the

following BMI categories of underweight (less than 18.5), optimal (from 18.5 to 22.99) and overweight (23 and above) according to Asian standard BMI [4]. Weekly intake of food was assessed by asking information about the intake of meat, milk, fruits, vegetables and rice. Disease status was assessed by asking questions about being diagnosed with diabetes mellitus, hypertension, cardiovascular heart disease, arthritis or any other chronic illnesses. The diseases mentioned were verified through the medical cards, prescription slips or medications which women were using at the time of interview.

Menopausal status of the women was ascertained through interviews. Women were categorized as menopausal if they had missed their periods for 12 months or more. While non-menopausal and peri menopausal women were those whose periods stopped for less than 12 months or who had irregular history of menstruation respectively and were considered as non menopausal for the purpose of this study. Age was verified by looking at the national identity card (NIC). Socio economic status was defined on the basis of area of residence into two categories. Azambasti and to Bilal colony were jointly considered as lower income and PECHS-1 as higher income areas. Informed consent was asked from every woman before the interview. Ethical approval of the study was obtained from Ethical Review Committee of Aga Khan University, Karachi Pakistan. The data were analyzed using Statistical Package for Social Sciences (SPSS) version 10. Frequency, mean and standard deviation were obtained for continuous variables while the categorical variable was assessed by computing frequencies. We used Logistic regression analysis to assess the impact of socio-economic status (dependant variable) on our variables of interest. Crude OR and 95 percent confidence interval (CI) were determined for each of the variable. *P*-values were calculated by likelihood ratio test for the significance of the beta coefficients; $P \leq 0.05$ was considered significant for all the independent variables in the model. Variables with significance of 0.2 were included in multiple logistic regression analysis to assess the impact of socio-economic factors while adjusting for other variables.

Results

We were able to interview a total of 1764 women with an overall response rate of 90 percent. Most of the refusals were from middle and high income area (26%) in spite of our changed strategy to interview women residing in apartment buildings. Refusal rate from low income area was two percent. The mean age of the respondents was 46 ± 5years. Nearly 59 percent of the women in lower income areas were illiterate as compared to 21 percent in higher income areas. The level of education attained was also better in the latter group. Approximately a quarter of women in lower income areas were working for income generation compared to 11 percent in the higher income group. (Table.1)

Table-1: Socio-Demographic characteristics of study women			
Characteristics	**All (n = 1,764)**	**Lower income area (LI) (n=1279)**	**Middle and higher income area (MHI) (n=485)**
Current Age in years			
40 – 45	1027 (58.2%)	822 (64.2%)	205 (42.2%)
46 – 50	309 (17.5%)	208 (16.2%)	101 (20.8%)
51 – 60	428 (24.2%)	249 (19.4%)	179 (36.9%)
Years- of Schooling			
Illiterate	860 (48%)	756 (59.1%)	104 (21.4%)
Grade 1 - 5	219 (12.1%)	203 (15.9%)	16 (3.3%)
Grade 6 - 9	212 (12.0%)	183 (14.3%)	29 (6.0%)
Grade 10	204 (11.5%)	107 (8.4%)	97 (20.0%)
Grade 11 -12	125 (7.0%)	21 (1.6%)	104 (21.4%)
Grade 12 - 14	117 (6.6%)	9 (0.7%)	108 (22.3%)
Grade 14 +	27 (1.5%)	0 (0%)	27 (5.6%)

Characteristics	All (n = 1,764)	Lower income area (LI) (n=1279)	Middle and higher income area (MHI) (n=485)
Working Status			
Employed	371 (21.0%)	317 (24.7%)	54 (11.1%)
Housewife	1393 (78.9%)	962 (75.2%)	431 (88.9%)
Ethnicity			
Urdu speaking	496 (28.1%)	245 (19.1%)	251(51.7%)
Punjabi	291 (16.4%)	268 (20.9%)	23 (4.7%)
Pathan /Balochi	331 (18.7%)	259 (20.2%)	72 (14.8%)
Sindhi	54 (3.0%)	39 (3.0%)	15 (3.0%)
Others *	592 (33.5%)	468 (36.5%)	124 (25.8%)
* Christian, Hindu, Parsi, Bengali, Kashmiri			

The prevalence of menopause observed in this age group was 39%. The mean age at menopause as reported by women was 45.2 (±3.8) years. Of these approximately 55 percent women had menopause between the ages of 46-50 years. No age difference was observed in age at menopause according to area of residence.

Women from MHI area had significantly higher prevalence of diabetes, hypertension and arthritis. Diabetes was more common as compared to hypertension and arthritis. No significant difference was seen for cardiovascular heart disease according to area of residence. (Table.2)

Table-2: Current co morbid status of the study women n (%)			
Comorbid status	**All (n = 1,764)**	**Lower income area (LI) (n =1279)**	**Middle and higher income area (MHI) (n = 485)**	**Crude Odds Ratio (95% C.I.)**
Diabetes (DM)	132 (7.5)	72 (5.6)	60 (12.4)	0.42 (0.29, 0.61)
Hypertension (HTN)	252 (14.3)	167 (13.1)	85 (17.5)	0.71 (0.53, 0.94)
Cardiovascular heart disease (CHD)	30 (1.7)	23 (1.8)	07 (1.4)	1.25 (0.53, 2.93)
Arthritis	216 (12.2)	138 (10.8)	78 (16.1)	0.63 (0.47, 0.85)

Majority of women had sedentary lifestyle. Almost all women in LI areas were sedentary whereas few women among MHI areas were lightly or moderately physically active. (Table-3)

Table-3: Current physical activity status of the study women n (%)			
Physical activity	**All (n = 1,764)**	**Lower income area (LI) (n =1279)**	**Middle and higher income area (MHI) (n = 485)**	**Crude Odds Ratio (95% C.I.)**
Sedentary (little or no exercise)	1717 (97.3)	1267 (99.1)	450 (92.8)	5.07 (1.69, 15.20)
Lightly active (light exercise/sports 1-3 days per week)	33 (1.9)	7 (0.5)	26 (5.4)	0.48 (0.12, 1.92)
Moderately to Extra active	14 (0.8)	5 (0.4)	9 (1.9)	1

Table 4 describes the unadjusted association of weekly dietary intake according socio-economic areas. Women from the lower income area reported eating meat far less than women from MHI area. Women in LI areas were 9.2 times (13.5% vs 3.9%, CI) more likely to eat meat just once or not at all during a week as compared to women of MHI area. The likelihood of eating meat twice or thrice in a week was 4.4 times for women of LI area as compared to high income area (65.1% vs 39.2 %). However in the reference category less than a quarter of women utilized meat four times or more as compared to women of MHI area (21.3% vs 57%). Over all almost every woman in our sample was eating meat twice or more in a week. But the intake was higher for women residing in MHI area. Similar results were observed for fruit intake. Women in LI areas were 83 times more likely to not have utilized any type of fruit or only once in a week as compared to women in MHI areas (36.1%vs 1.6%). The likelihood of eating fruits twice or thrice in a week by women in LI area was 5.6 times than those of MHI areas (46.4%vs 31.5%). However in the reference category the proportion of women in LI area who utilized fruit four time or more in a week as compared to women of MHI areas were far less (17.5% vs 66.8%).

Table-4: Weekly Food intake of the Study Women by socio-economic status				
Weekly intake of Food items	**All (n = 1,764)**	**Lower income area (LI) (n =1279)**	**Middle and higher income area (MHI) (n = 485)**	**Crude Odds Ratio (95% C.I.)**
Meat				
Never/Once	192 (10.9)	173 (13.5)	19 (3.9)	9.21 (5.57, 15.21)
Twice /Thrice	1023 (58.0)	833 (65.1)	190 (39.2)	4.43 (3.52, 5.58)
Four times or more	549 (31.1)	273 (21.3)	276 (56.9)	1
Fruits				
Never/Once	470 (26.6)	462 (36.1)	8 (1.6)	83.53 (40.68, 171.50)
Twice /Thrice	746 (42.3)	593 (46.4)	153 (31.5)	5.61 (4.38, 7.17)
Four times or more	548 (31.1)	224 (17.5)	324 (66.8)	1
Milk				
Never/Once	824 (46.7)	685 (53.6)	139 (28.7)	4.13 (3.18, 5.37)
Twice /Thrice	495 (28.1)	352 (27.5)	143 (29.5)	2.07 (1.58, 2.70)
Four times or more	445 (25.2)	242 (18.9)	203 (41.9)	1
Rice				
Never/Once	135 (7.7)	113 (8.8)	22 (4.5)	2.31 (1.43, 3.73)
Twice /Thrice	752 (426)	561 (43.9)	191 (39.4)	1.32 (1.06, 1.64)
Four times or more	877 (49.7)	605 (47.3)	272 (58.1)	1
Vegetables				
Never/Once	7 (0.4)	2 (0.2)	5 (1.0)	0.16 (0.03, 0.80)
Twice /Thrice	210 (11.9)	163 (12.7)	47 (9.7)	1.35 (0.96, 1.90)
Four times or more	1547 (87.7)	1114 (87.1)	433 (89.3)	1

Milk consumption was generally low irrespective of area of residence. Women in LI areas were 4 times more likely to not have utilized milk never or only once in a week (53.6%vs 28.7%). The likely hood of women in LI area to utilize milk two to three times was twice that of MHI area (27.5%vs 29.5%). In the reference category only 18.9 % of women were using milk four times or more in LI area as compared to 41.9% of women in MHI area. Same pattern

was observed for utilization of rice. On the contrary vegetable use was almost equal in women of both areas; where the once or never use of vegetable is less common as compared their use for 4 or more times. (Table.5)

Table-5: Adjusted ORs for co-morbidity, dietary habits and life style according to SES			
Characteristics	**Adjusted Odds Ratio (AOR)**	**95% C.I. for AOR**	
		Lower	**Upper**
Diabetes	0.51	0.33	0.79
Arthritis	0.68	0.47	0.99
Physical activity			
Sedentary (little or no exercise)	2.85	0.69	11.73
Lightly active (light exercise/sports 1-3 days/week)	0.45	0.08	2.60
Moderately to Extra active	1		
Meat			
Never/Once	3.08	1.68	5.67
Twice /Thrice	2.80	2.10	3.72
Four times or more	1		
Fruit			
Never/Once	51.91	24.75	108.89
Twice /Thrice	4.20	3.19	5.52
Four times or more	1		
Milk			
Never/Once	1.48	1.07	2.06
Twice /Thrice	1.29	0.93	1.79
Four times or more	1		
Rice			
Never/Once	3.12	1.81	5.38
Twice /Thrice	1.07	0.80	1.42
Four times or more	1		

The final model describes the same pattern of different factors. Diabetes Mellitus, arthritis, use of meat, fruit, milk and rice were found to be significant. Since for prevention of DM and arthritis, physical activity plays an important role therefore physical activity was also included in the final model. DM is significantly higher among MHI areas woman when controlled for arthritis, dietary practices and physical activity. Hypertension lost its significance on multivariate model.

Discussion

Menopause causes physiologic changes such as decline in ovarian function which is associated with spontaneous increase in proinflammatory cytokines, which explains the increased prevalence of chronic diseases such as arthritis, hypertension, diabetes mellitus and cardiovascular diseases in postmenopausal women. A menopausal woman with diabetes or hypertension has a 75 percent chance of death from cardiovascular disease, whereas a menopausal woman without these co-morbids has a 45 percent risk [12]. Our study subjects reported high burden of hypertension (14%), arthritis (12%) and diabetes (7%). Most of the women had BMI $\geq$ 23 kg/m2. Postmenopausal women have reached an age when the incidence of chronic health conditions becomes more prevalent. In addition to physical disease risks, a lifetime disability

may adversely affect their quality of life. Thus, obese postmenopausal women stand at a crossroads between living the remainder of their lives either in good health or facing the likely onset of chronic diseases that might have been prevented. Chronic disease prevention through lifestyle changes especially increase of physical activity is an important factor around menopausal transition [13]. A recent study has shown that exercise significantly decreased the chemical imbalances that can lead to heart disease and stroke in postmenopausal women. Exercise and nutrition play important roles in the prevention and treatment of obesity, cardiovascular disease and diabetes. A large majority of women in our sample from both lower and higher income areas did not exercise. Strategies to bring behavior change to improve life style are required and should be part of health messages through mass media. Our study shows that in poor income area very few women were consuming meat, vegetables or milk on daily basis but their obesity status was equivalent to those of higher income area. We believe that this disparity is due to universal sedentary life style. Additionally factors for obesity are consumption of high carbohydrate diet e.g. wheat as staple food and high preference of oily foods.

The high percentage of women with diabetes and hypertension in this age group is alarming. As the life expectancy of women at birth is increasing and male to female ratio is attaining equilibrium an urgent attention to health needs of elderly women is necessary. It is recommended that awareness about the increasing risk of diabetes and hypertension and related Cardiovascular Heart Disease should be raised and preventive messages regarding active life style and appropriate diet be given to the women in their adolescent ages as well as in their reproductive life years. In addition a life cycle approach to better reproductive health which prepares women for next stage in life should be emphasized in policy documents. To summarize elder women face a great risk of developing chronic disease with dire consequences. These women should be counseled regarding lifestyle modification, including healthy eating and regular physical activity [14-15]. As life expectancy is increasing in Pakistan the illnesses in these women would require additional treatment and rehabilitation costs. Preventive strategies in early life of woman can be very beneficial in preventing disabilities at later stages of life. The limitations of this study are that information regarding cancers as a co morbid, the age at marriage, contraceptive use, and number of gestation was not gathered. Information on time spent watching television was also not collected. Data regarding smoking status of the women could not be analysed because very few women admitted that they were smokers. Regarding sampling strategy Probability Proportional to Size Sampling technique could have provided more representative data.

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