International Journal of Advances in Medicine
Chandra M et al. Int J Adv Med. 2015 May;2(2):147-151
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: 10.5455/2349-3933.ijam20150514

Research Article

Obesity in Indian subjects with vascular dementia

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Received: 15 March 2015
Accepted: 21 April 2015

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ABSTRACT

Background: Obesity is considered a public health challenge in South Asia. Obesity is an independent risk factor in vascular dementia. It also contributes to other risk factors of vascular dementia like hypertension, coronary artery disease, dyslipidaemia and diabetes. As the rate of obesity in Indian subjects with vascular dementia is not known, we decided to assess obesity in subjects with vascular dementia.
Methods: Subjects with vascular dementia presenting to Memory Clinic of a tertiary care hospital over a period of 16 months were assessed for body mass index as a marker of obesity and for severity of dementia. Data obtained was analysed using SPSS version 17.
Results: Our study shows that in 159 subjects with vascular dementia about 17% subjects were overweight and 68% were obese. Only one subject was underweight. This is in excess of population prevalence of obesity in similar population. While there was no difference in age, education level and severity of dementia between subjects with normal weight, overweight and obesity, there was significant gender difference with females having more BMI than males in general and also across all levels of severity of dementia. This is in consonance with earlier studies showing female preponderance of obesity in subjects with vascular dementia.
Conclusions: Obesity is common in subjects with vascular dementia especially in female subjects. As obesity is an important contributory factor in vascular dementia, it follows that obesity management must be included as a part of comprehensive management strategy in subjects with vascular dementia particularly in females.

Keywords: Obesity, Overweight, Body mass index (BMI), Vascular dementia, Severity

INTRODUCTION

Obesity is a growing health problem worldwide. It is considered a public health challenge in South Asia. South Asian populations have been demonstrated to exhibit higher prevalence of abdominal obesity, raised percentage of fat and storage of fat at ectopic sites and a greater risk and of obesity related complications at a lower level of BMI than their Caucasian counterparts.[1-6] US National Heart, Lung and Blood Institute defines overweight and obesity as body mass index more than 25 and 30 kg/square metre respectively.[7] Most guidelines including WHO and Indian Consensus Group favour ethnic specific lower cut offs for Indians with Body Mass Index (BMI) of 23 to less than 25 kg/square metre as overweight and more than 25 kg/square metre as obese.[8,9]

There is a complex relationship between obesity and vascular dementia. Obesity has been reported to be an important independent contributory factor in the development of Vascular dementia in hospital based and community based studies.[10-12] Obesity may increase risk of vascular dementia by contributing to known risk factors like hypertension, diabetes mellitus, dyslipidaemia, atherosclerosis and cardiovascular disease

burden.[13-22] Hence, some authors deny the role of obesity as a truly independent risk factor in vascular dementia.[23] Prospective studies suggest that it is midlife obesity (and not cross sectional obesity) which may be a predictor of late life dementia.[24,25] However certain studies have reported weight loss and not obesity as a predictor of incident dementia suggesting a possible protective role especially for late life obesity.[26,27]

As obesity is widely prevalent in India and vascular dementia is the second most common types of dementia in clinical practice in India, we decided to investigate the phenomenon of obesity in Indian subjects with vascular dementia.[6,28]

METHODS

The study was done at memory clinic in our tertiary care hospital in accordance with the declaration of Helsinki after the study protocol had been duly approved by institutional ethics committee of PGIMER and Dr. Ram Manohar Lohia hospital on 7 May 2013. The study had a cross sectional observational design

Subjects with subjective memory loss attending memory clinic in our tertiary care hospital in New Delhi between 1/6/2013 and 31/10/2014 were screened for vascular dementia using clinical examination, Montreal Cognitive Assessment (MoCA), routine investigations and MRI scans. Subjects identified to have vascular dementia [confirmed as per National Institute of Neurological Disorders and Stroke and the Association Internationale pour la Recherché et l'Ensignement en Neurosicences (NINDS-AIRENS) criteria] were enrolled in the study after taking written informed consent.[29,30]

The subjects were assessed for dementia severity using Clinical Dementia Rating (CDR) Scale.[31] This scale rates the subject's performance in six domains: memory, orientation, judgment and problem solving, community affairs, home and hobbies, and personal care. It has high inter-rater reliability and validity.

Height was measured in metres using a wall mounted non extendable firm measuring tape calibrated for one mm. Subjects were instructed to stand erect in bare feet with feet positioned together and arms by their side for the purpose of measurement of height. Weight was measured using a weighing scale with 1 kg precision with subjects standing in designated place in bare feet wearing light clothing. The weighing machine was regularly checked for error using standardized weights. BMI was computed afterwards as weight in kg divided by square of height in metres (kg/m^2).

Underweight, normal weight, overweight and obesity were defined as BMI less than 18, between 18 to 23, between 23 to 25 and more than 25 respectively utilising Indian norms.[9] Data was analysed using SPSS version 17 using ANOVA for ratio level data (continuous variables) and Chi square tests for ordinal data (categorical variables).

RESULTS

The results are given in Table 1 and Figure 1 and 2.

Table 1: Socio demographic profile and BMI in subjects with vascular dementia.

Domain	Total N=159	Normal weight (BMI 18-23) (N=27) (16.98%)	Overweight (BMI 23 to <25) (N=27) (16.98%)	Obese (BMI >25) (N=105) (68.04%)	P value
Age (years) (Mean ± SD)	69.35 ±7.51	71.19 ± 8.30	69.67 ± 8.75	68.79 ± 6.93	0.328
Sex M:F N (%)	87:72 (54.7:45.3)	18:9 (53.3:46.7)	23:4 (56.9:43.1)	46:59 (51.5:48.5)	0.000*
Education (years) (Mean ± SD)	11.34 ± 3.76	12.19 ± 4.10	12.40 ± 3.49	10.85 ± 3.68	0.069
Mild dementia N (%)	64 (39.7%)	11(40.74)	8 (29.63)	45(42.86)	0.158
Moderate dementia N (%)	59 (38.4%)	6 (22.22)	12 (44.44)	41 (39.05)	
Severe dementia N (%)	36 (21.9%)	10 (37.04)	7 (25.93)	19 (18.10)	

The mean BMI of 159 subjects with vascular dementia was 26.27 ± 4.11 kg/m^2. Data revealed a high rate of over weight (nearly 17%) and obese subjects (68%) with less than 17 % of study subjects having normal BMI. Only one male subject (0.6%) was underweight (BMI = 15.42%) and had severe dementia. For the purpose of analysis, he was subsumed in the normal weight group.

Data was classified into normal weight, overweight and obese subjects based on BMI cut offs. There was no significant difference in BMI with respect to age and education. There was a highly significant female preponderance of obesity. (mean BMI of males 25.14 ± 3.50 kg/m^2 and of females 27.64 ± 4.39 kg/m^2; P = 0.000) and also on severity wise stratification (Figure 1 and 2).

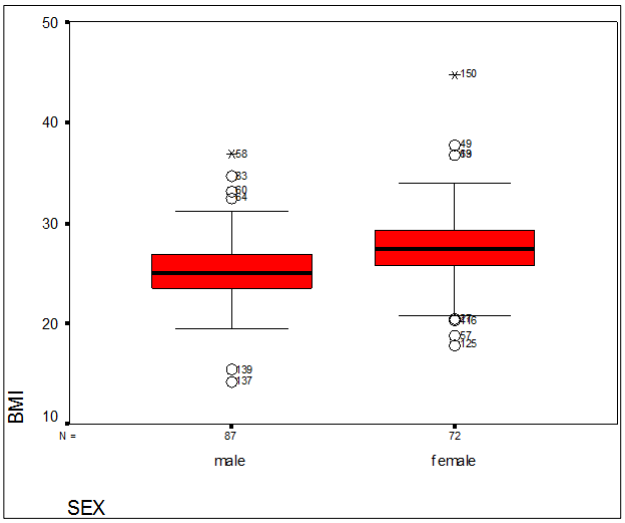

Figure 1: Gender wise difference in BMI in subjects with vascular dementia (x axis: severity of dementia; y axis: BMI in kg/m^2) (Mean BMI in males = 25.14 ± 3.5 kg/m^2 and females 27.64 ± 4.39 kg/m^2; P = 0.000).

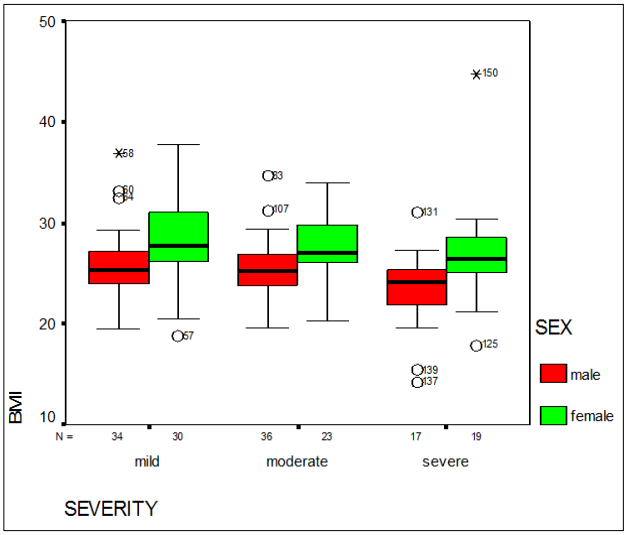

Figure 2: Gender wise difference in BMI in subjects with vascular dementia across different severity states (x axis: severity of dementia; y axis: BMI in kg/m^2).

DISCUSSION

While there is a high prevalence of obesity in urban adults in the same city as per an earlier study (overall prevalence 50.1%; 50.2% in males and 50.0% in females), the subjects with vascular dementia in our study at 68% had even higher rates of obesity.[32]

The high rates of obesity in Indian subjects with vascular dementia can be explained by a number of socio cultural factors. Middle aged and elderly Indians typically stay in families with a common kitchen with a common menu. Subjects with dementia become dependent on others for diet and may receive diet common to the whole household which may be inappropriate for their medical needs. They may also experience an increase in appetite as part of the illness and hence may gain weight.

As the cooking and its supervision are generally done by females, they have a greater access to food and food choices and this factor may also contribute to weight gain.

Factors like decreased physical mobility, decreased capacity for Activities of Daily Living (ADL) and visuo-spatial deficits which are part of the syndrome of dementia may contribute to decrease exercise levels and hence inappropriate weight gain.

The three weight groups were comparable on age and education suggesting that advancing age and premorbid educational attainment had little impact on weight issues in subjects with vascular dementia.

BMI significantly different across gender with females being more obese in general and across all severity states of dementia (Figure 1 and 2). This reflects findings in previous studies which indicate female subjects with vascular dementia have significantly higher BMI.[33]

There was no significant difference in BMI and obesity across the three severity states of mild dementia (CDR1), moderate dementia (CDR2) and severe dementia (CDR3). Though the severe dementia group had the highest rate of subjects with normal BMI (more than 37 28%), the difference was not statistically significant. Further the severe dementia subjects were significantly older than subjects with mild or moderate dementia (P = 0.002).[34] The normalisation of weight in this group may actually represent a loss of weight and reduction in BMI from pre morbid midlife obese state with ageing as well as progression of dementia.[35-42]

Thus cross sectional absolute BMI may not be an appropriate predictor of severity which is consonance with findings that midlife obesity is a better predictor of late life dementia.[36,43,44]

The choice of BMI as a measure of obesity may have also a marginal impact on the results. While adiposity site, waist hip ratio and waist circumference are known to be better predictors of obesity associated dementia risk than BMI, it is unlikely that the broad trends seen in our study would be reversed.[45-47]

To conclude, obesity is common in Indian subjects with vascular dementia especially female subjects and is seen across age and across severity spectrum of vascular

dementia. Obesity can contribute of vascular dementia independently and by enhancing the possibility of known cardiovascular and metabolic risk factors. Hence obesity management must be included as part of comprehensive management strategy in vascular dementia.

ACKNOWLEDGEMENTS

This paper was written as a part of PhD research carried out at post graduate institute of medical education and research and Dr. Ram Manohar Lohia hospital under Guru Gobind Singh Indra Prastha University, New Delhi.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee of Dr. Ram Manohar Lohia hospital, New Delhi

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DOI: 10.5455/2349-3933.ijam20150514
Cite this article as: Chandra M, Anand KS. Obesity in Indian subjects with vascular dementia. Int J Adv Med 2015;2:147-51.