Original Article

Role of Visfatin as a Marker for Depression in Elderly Patients

Sabeen H. Qazi, Shaista Emad, Rubina Ghani

ABSTRACT:

Objective: To identify a new marker for depression amongst the elderly residing in old age institutes (OAI) of Karachi.

Study Design and Setting: This was a case control study which was carried out by visiting different private old age institutions in the city of Karachi, Pakistan from 2017- 2018.

Methodology: A total of 164 people aged 60 years or more were enrolled via convenient sampling. Basic anthropometric variables were measured, lipid profile was estimated as well as serum Visfatin was estimated via ELISA and was also estimated.

Results: The BMI, serum triglyceride and visfatin in depressed subjects were significant with p values < 0.001 **, < 0.004* and < 0.001* respectively. Systolic blood pressure was highly significant in depressed subjects when compared with control cases *p value < 0.000***.The diastolic blood pressure was significant *p value < 0.001** as well. Visfatin was found to be negatively correlated with triglycerides, BMI and LDL and it was weakly correlated with depression.

Conclusion: The levels of visfatin were found raised in the depressed individuals but they were statistically not significant. It is suggested that more studies on visfatin can be done to find its association in the identification of depressive symptoms in patients suffering from depression.

Keywords: Geriatric depression, old age institutes, lipid profile, visfatin.

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INTRODUCTION:

Depression or major depressive disorder is a devastating condition and represents one of the leading causes of disability worldwide. It can be defined as having lack of interest in normal day to day activities, feeling of sadness as well as changes in daily sleeping and eating habits. This leads to irritable mood most of the day, as noticed by the person or observed by others. Depression hinders people from achieving their complete potential, impairs the finances and is associated with an earlier mortality from suicidal tendencies or other associated illnesses.[1] Depression is classified as mild, moderate or severe depending on severity as well as number of times symptoms occur. The number of cases of depression worldwide have increased by about 50%.[2] Half of the people affected with depression live in the South-East Asian region with an elderly predominance.[3] In the year 2016, a prevalence of 3% was found in Pakistan with highest depressive disorders amongst the females and elderly.[4]

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Late life depression is often unacknowledged, which results in a poor quality of life.[5] Depression amongst the elderly is identified via the GDS (Geriatric depression scale). There is an enormous evidence to reinforce its reliability and validity for measurement of depressive symptoms amongst the elderly. A proposed score of 0-9 tells that the person is normal, 10-19 score is marked as mildly depressed whereas, marking of 20-30 shows severe depression.[6]

Pakistan is the 6th most populated country in the world. Local data has suggested that elderly population is expected to rise to about 16% by the year 2050.[7] People usually find it difficult to manage time for taking care of the elderly people who require a lot of attention especially the ones who are sick or have any disabilities due to their progressing age. This has resulted in the institutionalization of the old individuals into old age institutes (OAI).[8] It is observed that the psychosocial requirements and issues affect the mental health of the elderly.[9]

Visfatin also known as Pre B cell Colony Enhancing Factor (PBEF) or (NAMPRT) Nicotinamide phosphoribosyl transferase was identified in 2005 and it plays a role in the salvage pathway of NAD?.[10] Visfatin has also been suggested as a potential biomarker for early identification of cancers.[11] In obese diabetics and non-diabetics, visfatin was increased when compared with controls.[12] A positive association was observed between binge eating and visfatin.[13]

Many studies have already shown a bidirectional association between depression and adiposity. The Obesity-depression–inflammation cycle has been described in which a low grade inflammation is responsible for creating a link

between depression and obesity.[14] The function of adipose tissue is no more identified as only storage of lipids but it produces adipocytokines for metabolic regulators like adiponectin, visfatin, leptin which interfere with different pathways including the immune system.[15] The aim of present study was to identify one of the biomarker of depression "visfatin" which was not previously studied in elderly depressed patients in our set ups.

METHODOLOGY:

This case control study was carried out at 4 different old age institutes located in Karachi namely Anmol Zindagi trust, Dar ul Sakoon home for elderly, Gills shelter old age home and Sahara Village old age home from September 2017 to March 2018. Elderly people aged = 60 of either sex were selected for this study. A total of (n=164) samples were collected via convenient sampling under fasting conditions. History was taken along with the Geriatric Depression scale (GDS).For the purpose of study questionnaire administration and basic anthropometric parameters were noted on all participants of the study. Blood sample of each participant were drawn for biochemical estimations of serum lipid profile and visfatin. A written consent was acquired from each participant of our study. A permission letter for conducting research was obtained from BMSI (Ref. NO. F. 1-2/2017-BMSI/JPMC). Study was conducted in accordance with Declaration of Helsinki. Elderly people aged = 60 were selected for this study. Those taking lipid lowering drugs, had diabetes, any mental diseases or any other chronic illnesses were excluded. Data analysis was done by One-way ANOVA (Bonferroni test) by using SPSS 20.0 software.

RESULTS:

The anthropometric analysis was carried out showing that in depressed patients, the systolic and diastolic blood pressure both were highly significant. During this study BMI was also observed to be significant in depressed whereas the age and waist to hip ratio were found to be statistically insignificant as shown in table 1.

The biochemical parameters were carried out and depressed was compared with normal subjects. The total serum cholesterol and LDL cholesterol were statistically significant in depressed cases. Visfatin was compared with controls and it was observed that it was strongly significant in depressed elderly cases as shown in table 2.

The correlation study was also carried out and we found that visfatin was negatively correlated with triglycerides, BMI and LDL as shown in figure 1, 2 and 3. Visfatin was found to be weakly correlated with depression as shown in figure 4.

DISCUSSION:

Pakistani society is one where we have a joint family system and elderly individuals are considered as the head of families. The advent of modern era has led to westernization, where men and women both are working due to which they are unable to find time to take care of their parents. This led to the need for OAI. Elderly people become depressed and find themselves helpless and lonely although they have companions living with them of similar age group.

Table 1: Comparison of anthropometric parameters between depressed cases with controls

Variables	Controls (82)	Depressed (82)	p values
Age (Years)	67.16 + 7.76	69.10 + 8.18	> 0.05
BMI (Kg/m^2)	22.96 + 3.80	26.03 + 6.89	< 0.001 **
WHR	0.91 + 0.08	0.88 + 0.08	> 0.05
Systolic BP (mm of Hg)	120.68 + 16.94	133.74 + 17.47	< 0.000 **
Diastolic BP (mm of Hg)	74.78 + 11.59	81.96 + 12.32	< 0.001 **

For statistical analysis, one-way ANOVA (Bonferroni test) was used between the controls and the depressed groups.
** p value < 0.001
* p value < 0.05

Table 2: Comparison of biochemical parameters between depressed cases with controls

Variables	Controls (n=82)	Depressed (n=82)	*p values*
Total Cholesterol (mg/dl) (TC)	174.11 + 65.17	206.83 + 44.22	< 0.000 **
TG (mg/dl)	143.18 + 47.44	166.84 + 48.39	< 0.004 *
HDL (mg/dl)	35.16 + 7.33	36.00 + 6.06	> 0.05
LDL (mg/dl)	117.68 + 43.00	165.88 + 70.35	< 0.000 **
Visfatin (ng/ml)	5.81 + 2.40	8.25 + 4.54	< 0.001 **

*** p value < 0.001;*
** p value < 0.05*

Figure 1: Correlation of Visfatin with BMI.

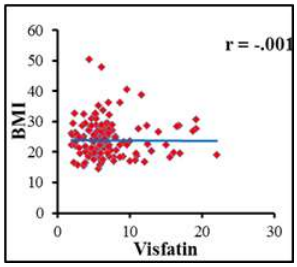


Figure 2: Correlation of Visfatin with Triglycerides

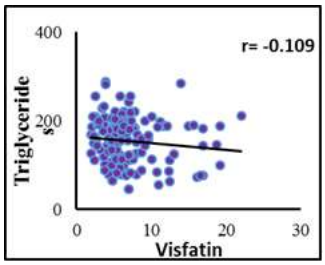


Figure 3: Correlation of Visfatin with LDL

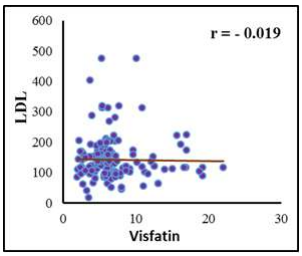
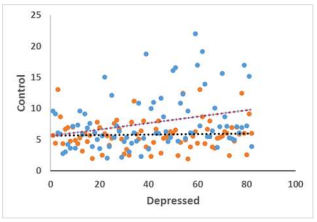


Figure 4: Correlation of Visfatin with depression



The proposed hypothesis of the study was the visfatin levels will be raised in depression of elderly people staying in OAI's. The results of the study were in accordance with our hypothesis as there was a significant increase in visfatin levels amongst the elderly people who were depressed.

The bridge between depression and obesity is inflammation.[16] Altered adipose tissue and gut microorganisms cause production of inflammatory factors, causing chronic inflammation.[17]

It was found that the body mass index (BMI), systolic blood pressure and triglycerides (TG) were associated with depression[18], which was similar to our study where we found body mass index, systolic blood pressure, triglycerides, total cholesterol, low density lipoprotein and visfatin were significant.

During our study it was observed that increased systolic and diastolic blood pressures which might be due to depression leading to increased activation of sympathetic nervous system along with genetic influences.[19] It was reported that people who were depressed had a poor adherence to taking anti-hypertensive medicine causing poor control of their blood pressures.[20]Another study also reported that the elderly treated with antidepressants and anti hypertensives showed a decrease in depression, systolic blood pressure and diastolic blood pressure.[21] A meta-analysis reported a notable increase in visfatin levels in hypertensives and cerebrovascular accident patients. [22]

Two Chinese studies [23,24] and a South Korean study [25]are in conflict with our study as they support the "fat and jolly hypothesis" where they found that middle aged and elderly people with low BMI were more depressed so they concluded that depression leads to weight loss in elderly Asians. However another longitudinal study on community residing elderly concluded that an increase in BMI showed increased depressive symptoms, which is in concordance with our study.[26] A study reported raised visfatin levels in obese individuals with low HDL levels which is similar to our study.[27]

An extensive study was conducted on visfatin at genetic level by knocking out NAMPT gene in mice and comparing with normal gene mice. It was found that in lipid metabolism 29 out of 32 enzymes were down regulated. This explained high TG in visfatin gene knocked out mice. [28] A study reported that visfatin was synthesized and released from endothelial cells of human due to ongoing inflammation and since depression is also an inflammatory condition therefore we can link that increased visfatin levels would be observed in depressed individuals.[29]

The increased visfatin levels would be observed in depressed individuals by a study which observed that people having hypertension had raised levels of TC, TG, LDL, BMI and visfatin levels this is in agreement with our study. [30]

This study was carried out on adipocytokine visfatin which was not studied till date in humans with relation to depression which was indeed the strength of the study. This study had a small sample size and should be carried out on a larger sample size in future. This study detected depression via self-reported questionnaire (GDS- mild, moderate, severe depression categories valid on Pakistani population) not clinical assessment. Visfatin has been studied as the biomarker for depression. It will be beneficial to study other inflammatory mediators like C-reactive protein in depressed patients.

CONCLUSION:

It was concluded that visfatin can be studied as a marker for depression and recommend that it should be studied on a larger sample size to predict depression in elderly.

Author Contribution:
Sabeen H. Qazi: Principal Investigator
Shaista Emad: Statistics
Rubina Ghani: Supervisor

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