

ORIGINAL ARTICLE

PREVALENCE OF METABOLIC SYNDROME AND ITS ASSOCIATED FACTORS IN PATIENTS WITH MAJOR DEPRESSIVE DISORDER (MDD)

Chawanun Charnsil, Sudrak Pilakanta, Suksiri Panikul

Department of Psychiatry, Faculty of Medicine,
Chiang Mai University, Thailand 50000.

Abstract

Objectives: To determine the prevalence of metabolic syndrome and examine its association with patients with major depressive disorder. **Methods:** All patients diagnosed with major depressive disorder (MDD) who visited the Psychiatric Outpatient Clinic at Maharaj Nakorn Chiang Mai Hospital were invited to participate in this study. Subjects who met the inclusion criteria and did not have exclusion criteria were included in this project until 140 subjects were enrolled. The criteria proposed by the American Heart Association/National Heart, Lung, and Blood Institute (updated ATP III) were utilized for diagnosing metabolic syndrome. Age, history of antidepressant and antipsychotic use, time of illness, severity of illness and family history of metabolic syndrome were assessed as factors associated with metabolic syndrome. Data was analyzed by using percentage, mean, standard deviations, student t-test, chi-square test and Fisher's exact test. **Results:** One hundred forty subjects were recruited. The prevalence of metabolic syndrome determined by the American Heart Association/National Heart, Lung, and Blood Institute (updated ATP III) was 37.9% (53). Age was significantly associated with metabolic syndrome in patients with a major depressive disorder ($p \leq 0.001$). The duration of illness, duration of treatment, family history of diabetes, hypertension and dyslipidemia were not associated with metabolic syndrome. **Conclusions:** A high proportion of Thai patients with MDD had metabolic syndrome. These findings support the importance of assessing and monitoring metabolic syndrome in MDD patients, especially in older patients. *ASEAN Journal of Psychiatry, Vol. 16 (2): July – December 2015: XX XX.*

Keywords: Depression, Metabolic Syndrome, Prevalence

Introduction

Metabolic syndrome is a disorder of energy utilization and storage, diagnosed by a co-occurrence of three out of five of the following medical conditions: abdominal (central) obesity, elevated blood pressure, elevated fasting plasma glucose, high serum triglycerides, and low high-density cholesterol (HDL) levels. It has long been recognized that certain metabolic conditions are associated with cardiovascular disease and increased risk for morbidity and mortality [1,2]. In the USA

the prevalence of metabolic syndrome was estimated at 34% of the adult population [3]. Patients with mental disorders have a shorter life expectancy than the general population [4]. One common cause of death is the cardiovascular disease which is closely related to the metabolic syndrome.

Major depressive disorder (MDD) is a mental disorder characterized by a pervasive and a persistent low mood which is accompanied by low self-esteem and a loss of interest or pleasure in normally enjoyable activities.

Levels of functional impairment in depression are considered even greater than with other long-term somatic disorders, such as hypertension and diabetics, and rank close to myocardial infarction. The global burden of disease reported by the World Health Organization in 2004 showed that MDD had the most years lost due to disability and ranked third in Disability Adjusted Life Years (DALYs). Although the majority of studies have focused on the risk of metabolic syndrome for patients with schizophrenia exposed to atypical antipsychotics, other psychiatric patients appear to be at risk for metabolic disturbances as well [5-7]. Major depressive disorder (MDD) may be of particular interest because it is much more common than schizophrenia and is treated with a broad range of psychotropic medications, especially atypical antipsychotics.

Tuula H and colleagues examined the prevalence of metabolic syndrome in 121 MDD patients. The results showed that 44 of 121 patients (34%) had metabolic syndrome.[8] Kinder LS et al. found that the prevalence of metabolic syndrome in women with MDD was more than double than that of women in the general population[9]. Differences of race, lifestyle and prescription medications may affect the prevalence in different countries. In the review of literature, we found that there were differences in the prevalence of metabolic syndrome in many countries. In Thailand, there was no reported study regarding metabolic syndrome in MDD patients. This research aimed to examine the prevalence of, and factors associated with metabolic syndrome in Thai patients with MDD.

Methods

This research was approved by the Ethics Committee of the Faculty of Medicine ChiangMai University. Inclusion criteria were patients with MDD who were seen in at the Psychiatric Outpatient Clinic of Maharaj Nakorn ChiangMai University Hospital whose ages were eighteen or above and agreed to join this research. The diagnosis of MDD was determined by an experienced psychiatrist using the Mini-international Neuropsychiatric

Interview (M.I.N.I).The diagnostic criteria were based on DSM IV-TR. Subjects, who had conditions that affected their communication or their ability to give general information were excluded. All patients who met the inclusion criteria and did not have exclusion criteria were invited until the target sample size was reached.Thai-version of the Mini International Neuropsychiatric Interview (M.I.N.I) had Kappa and sensitivity >0.75, >0.81, respectively [10].

The sample size was calculated by using formula $N = Z_{\alpha/2}^2 PQ/E^2$ P= Prevalence= 36 % or 0.36 (10)*(*Tuula H.Heiskanen,Leo K. Niskanen,Jukka J. Hintikka et al. Metabolic Syndrome and Depression a Cross-Sectional Analysis. J Clin Psychiatry 2006;67:1422-1427[8].)

$$Q = 1 - P = 1 - 0.36 = 0.64$$

$$E = \text{Acceptable Error} = 0.1$$

$$95\% \text{ Confidence Interval } Z_{\alpha/2} = Z_{0.05/2} = 1.96$$

$$N = (1.96)^2 (0.36 \times 0.64) / (0.10)^2 = 89$$

Because we planned to follow up the patients, we set the target sample size at 140 to cover for the 30 percent loss to follow up patients. All subjects were interviewed for general information, history of illness, age of onset, numbers of hospitalizations, history of suicidal attempts and current prescriptions. The severity of the current episode was determined by the Hamilton rating scale for depression (HAM-D).All subjects were examined physically by the psychiatrist. Blood pressure was measured by only one sphygmomanometer (e-sphyg2). Body weight was measured by only one scale (TCS-200-RT). The waist circumference was measured two times in a standing position at the midline between the costal margin and the iliac crest and then averaged. An initial fasting blood sugar and lipid profile exam was obtained on each patient.

Diagnostic criteria of metabolic syndrome was classified by using the Adult Treatment Panel (ATP) III criteria for Asians. The diagnosis of metabolic syndrome was applied if patients meet three of the following five criteria: (i) elevated waist circumference: male ≥ 90 cm, female ≥ 80 cm, (ii) elevated triglycerides: ≥ 150 mg/dL or taking medication that reduced

triglycerides, (iii) reduced HDL cholesterol: male < 40mg/dL, female < 50mg/dL or taking medication that reduced cholesterol, (iv) elevated blood pressure: $\geq 130/85$ mmHg or taking medication to treat hypertension, and (v) elevated fasting glucose: ≥ 100 mg/dL or taking medication to treat diabetes.

Results

One hundred and forty five patients with MDD were recruited to the study. Five were eliminated because they did not come for a scheduled blood test. One hundred and forty patients participated in the study. General information is shown in Table 1.

Table 1. Demographic Characteristic and Differences between Patients with and without Metabolic Syndrome

	Metabolic Syndrome		OR 95% CI*	p-value
	Yes (n=53)	No (n=87)		
Sex				
Male	19 (35.8%)	26 (29.9%)	1	0.464
Female	34 (64.2%)	61 (70.1%)	0.763 (0.369-1.575)	
Age Group				
≤ 30	1 (1.9%)	1 (1.1%)	1	0.001
31-45	5 (9.4%)	21 (24.1%)	0.51 (0.10-2.63)	
46-60	32 (60.4%)	58 (66.7%)	2.84 (0.73-11.07)	
≥ 61	15 (28.3%)	7 (8.0%)	7.89 (1.65-37.40)	
Duration of Illness				
<1 Year	28 (52.8%)	37 (42.5%)	1	0.270
1 to <3 Years	17 (32.1%)	40 (46.0%)	0.562 (0.265-1.189)	
≥ 3 Years	8 (15.1%)	10 (11.5%)	1.057 (0.369-3.025)	
Atypical Antipsychotic Medication				
Yes	4 (7.5%)	10 (11.5%)	1	0.450
No	49 (92.5%)	77 (88.5%)	1.591 (0.473-5.354)	

OR 95% CI = Odds Ratio 95% Confidence Intervals

Primary Outcomes: A total of 53 of 140 patients (37.8%) met ATP III metabolic syndrome criteria (19 of 45 males and 34 of 95 females). Using Spearman's correlation coefficients, we found that age was the only

factor that had a significant relationship to metabolic syndrome. Durations of illness and use of atypical antipsychotic medications were not related to metabolic syndrome as shown in Table 1.

Table 2. Logistic regression model for metabolic syndrome in patients with major depressive disorder

Variables	β	SE	p-value	OR	95% CI for OR	
					Lower	Upper
Sex	-0.52	0.40	0.20	0.60	0.27	1.32
Age group	1.04	0.27	< 0.05	2.83	1.68	4.78
Duration of illness	0.00	.00	0.75	0.99	0.99	1.00
Atypical antipsychotic medication	-.39	0.65	0.55	0.68	0.19	2.41
Constant	-1.41	0.81	0.08	0.24		

(β = Beta, SE = Standard error; OR = Odds Ratio; CI = Confidence interval; Nagelkerke R Square = 18.3%)

All the variables in Table 1 were included in the logistic regression model (enter method). The results show that the age group was still significant after the adjustment for sex, duration of illness, and atypical medication with the odds of 2.83 (1.68-4.78) for each increasing 30 year. The Nagelkerke R^2 was 18.3%, which indicated that the four factors predict 18.3% of metabolic syndrome in patients with major depressive disorder.

Discussion

The prevalence of metabolic syndrome in our study was 37.8% compared with Tuula's study in the US(36%), Hieskanen TH's study in Finland(36%) and Hat NH's study in Malaysia(37.5%), the findings were comparable to the prevalence from our findings[8,11,14]. These confirmed that metabolic syndrome is a common problem in patients with MDD.

From our findings, age was the only factor associated with metabolic syndrome. This finding corresponds with Ervin's findings. Ervin, who studied the general population, found that males and females 40–59 years of age were about three times as likely as those 20–39 years of age to meet the criteria for metabolic syndrome. Males 60 years of age and over were more than four times as likely and females 60 years of age and over were more than six times as likely as the youngest age group to meet the criteria. Although atypical antipsychotic medication has been associated with metabolic syndrome, our findings did not demonstrate that. Our findings corresponded with study of J.W.Goethe (2009)[13] and can be explained by the few numbers of patients using atypical antipsychotic medication in our study.

Sex was not a factor that was associated with metabolic syndrome in this study which was a bit controversial. Many studies showed that females had a higher risk of developing metabolic syndrome [12,13]. There were also some studies that are shown that sex was not an associated factor [10,11]. Further study with a larger sample size in a community setting is needed.

From our findings duration of illness was not associated with metabolic syndrome, which was in contrast with Hat NH's finding. This can explain that subjects in our study mostly had a duration of illness less than three years(87.1%). Our limitations were the small sample size and that the study was not conducted in a hospital setting. Although we met the sample size that we calculated, the small number of subjects might have caused some of the associated factors to be insignificant such as atypical antipsychotic usage. In a hospital setting, we would have patients who were aware of their illness but this did not represent some patients who were not aware of their illness who remain in the community.

Conclusion

Metabolic syndrome in Thai people with MDD is as common as is found in other countries. Since age was a factor associated with metabolic syndrome, we should monitor metabolic syndrome in patients with MDD, especially in ages over 30 years.

Acknowledgement

This research was funded by the Faculty of Medicine Chiang Mai University (Code number 307/2012).

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Corresponding author: Chawanun Charmsil, Department of Psychiatry, Faculty of Medicine, Chiang Mai University, Thailand 50000.

Email: charmsil.research@yahoo.com

Received: 14 January 2015

Accepted: 5 July 2015