

ORIGINAL ARTICLE

THE EFFECT OF DEPRESSIVE DISORDERS ON COMPLIANCE
AMONG HYPERTENSIVE PATIENTS UNDERGOING
PHARMACOTHERAPY

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Abstract

Objective: To study the effect of depressive disorders, severity of depression and, sociodemographic factors on drug compliance among hypertensive patients at primary care clinics. **Methods:** A total of 201 hypertensive patients on treatment for at least 3 months who attended the HUKM Primary Care Clinic and Salak Polyclinic were selected for this study. Patients were screened for depressive disorders using the Hospital Anxiety Depression Scale (HADS) and those who scored 8 and more were further interviewed to establish a diagnosis using the Mini International Neuropsychiatric Interview (MINI). Patients who were diagnosed to have depressive disorders were further rated for the severity of the illness by using Hamilton Rating Scale for Depression (HAMD). Drug compliance was assessed during a 2 month follow up using the pill counting method (ratio 0.8 – 1.2 considered as compliant). **Results:** The prevalence of non-compliance among hypertensive patients was 38.3%. There was no association between the diagnosis of depressive disorders and drug compliance. Among the 12 patients who had depressive disorders, severity of depression as rated by HAMD, showed significant association with drug compliance (Mann-Whitney test $z = -2.083$, $p < 0.05$). **Conclusion:** The results suggested that severity of depression has significant association with poor compliance to medical treatment. It is therefore very important to identify and treat depression to avoid poor drug compliance and further complications related to hypertension. *ASEAN Journal of Psychiatry, Vol.10 (2): July – Dec 2009: XX XX.*

Keywords: depression, compliance, hypertensive patients

Introduction

Hypertension is known to be the most important risk factor for cardiovascular morbidity. In Malaysia, hypertension is ranked as the first in the list of the 10 leading causes of hospitalization [1]. In contrast, compliance to treatment among hypertensive patient is poor. A local study on drug compliance in hypertensive patients using the pill-counting method showed that a prevalence of non-compliance with medication of 26% [2]. One of the known factors associated with poor compliance with antihypertensive medication was depression [3] and scientific studies have examined the relation between them [4]. However it has also been proposed that hypertension itself is a risk factor for depression [5-7]. In Malaysia, neurotic depression (3.31%) is the most common psychiatric diagnosis [8] and the prevalence of emotional disorders is 15.2% [9]. This indicates clearly that hypertensive patients who are suffering from depressive illness are at a higher risk to develop cardiovascular disease. All medical professionals should take extra caution to prevent lethal complication by treating hypertension and depression properly. The objective of this study is to examine the effects of depression on compliance among hypertensive patients undergoing pharmacotherapy and to look for any modifiable factors needed to deal with the compliance problems.

Methods

This study was part of an Intensified Research in Priorities Areas (IRPA) project entitled "To identify the psychosocial factors of non-compliance among patients with hypertension

undergoing pharmacotherapy". This study was conducted at 2 centers i.e: the Primary Care Clinic of HUKM in Bandar Tasik Selatan and Salak Polyclinic, in Sepang. The study was conducted from the beginning of June 2004 to the end of December 2004. This was a cross sectional study and study subject were selected using the universal sampling. The estimated sample size was calculated using the PS software (Dupont & Plummer, 1997), based on comparing two proportions to detect the difference of 24% in prevalence ($P_1 - P_0$) with 80% power and alpha 0.05. A total of 196 subjects were needed for this study.

Inclusion criteria includes patients aged 40 years and above who had been diagnosed to have Essential Hypertension, must be on antihypertensive medication for at least 3 months prior to the study, can read and write, and able to converse in English or the Malay language. Patients must give written informed consent for enrollment in this study.

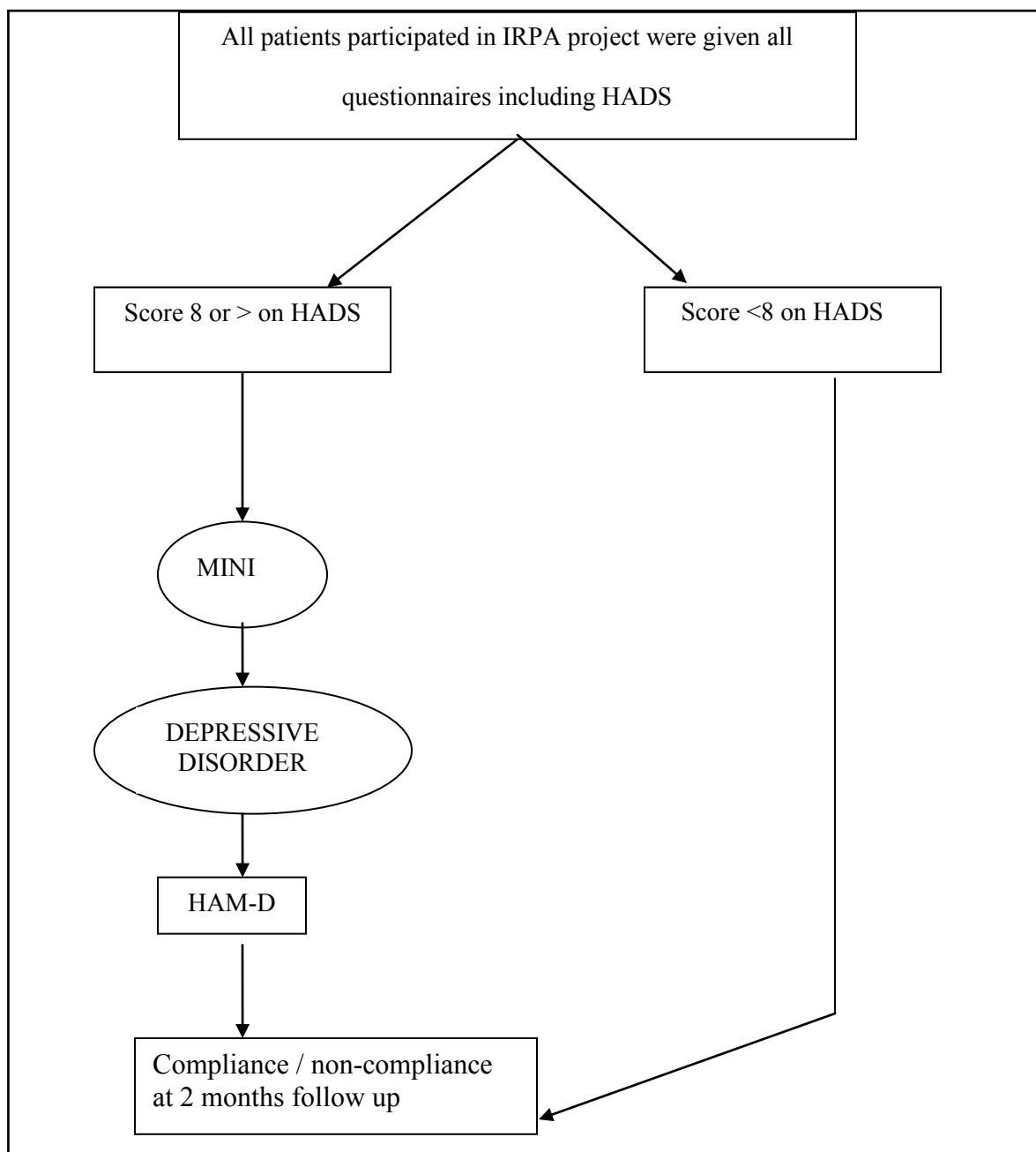
Exclusion criteria included pregnancy, secondary hypertension, renal impairment (serum creatinine > 125 mmol/L) within the last 6 months of recruitment date, impaired liver function tests (> 3 times the upper limit of normal range), concomitant medical diseases (diabetes mellitus, ischaemic heart disease, congestive cardiac failure, cerebrovascular accidents, bronchial asthma and chronic obstructive pulmonary disease) and blood pressure of 200/120 mmHg or more.

This study embraced a two-stage case-identification process in which a screening procedure was followed by a

diagnostic interview. All hypertensive patients who fulfilled the inclusion criteria were offered to join the study with written informed consent taken. The initial samples were screened for depression using the self rated Hospital Anxiety Depression Scale (HADS) [10] and only a sub-sample (those who had HADS score >8) received the full

diagnostic interview using Mini International Neuropsychiatric Interview (M.I.N.I) [11]. The administration of M.I.N.I was done by two trained psychiatric doctors. Those with depression would further undergo severity rating using Hamilton Rating Scale for Depression (HAM-D) [12].

Flow chart of the study procedure



Compliance to treatment was done based on the pill counting method, i.e: counting the left over medication during follow-up visits. For this purpose all the antihypertensive medications prescribed to the patient would be counted by the research assistant without the patient's knowledge to prevent bias. The medication was prescribed for 10 weeks but the appointment date was 8 weeks. During the subsequent follow up, the left over medication needed to be returned and counted. If the patient failed to turn up 7 days after the appointment date, phone call would be made to remind them about their appointment. The ratio of the used medication then calculated, for this study acceptable ratio was 0.8 to 1.2 [2,27]. If the patient forgot to bring the medication, they were allowed to bring it the next day, but if they failed to do so, they were considered as non compliant.

Data analysis

Analysis of the data was done by using the computer program, Statistical Package for Social Studies (SPSS) Version 11.5 and Stata Version 8.1. The basic descriptive statistics were calculated. Compliance to treatment was taken as the dependent variable. The

independent variables were the HADS scores, HAM-D scores and the sociodemographic data. Logistic Regression was used for dichotomous dependent variable.

Ethical consideration

This research project was approved by the Research and Ethics Committee, Faculty of Medicine, Universiti Kebangsaan Malaysia. The purpose of the study was explained to the subjects before agreeing to participate in the major IRPA study. Those who were found to have depressive disorders were referred to the psychiatric clinic for further management.

Results

A total of 207 patients who attended the primary care clinic of HUKM in Bandar Tasik Selatan, Cheras, Kuala Lumpur and Salak Polyclinic (127 and 80 patients respectively) were invited to participate in the study. However, 2 refused to join the study, 1 was excluded due to newly diagnosed Diabetes Mellitus and another 4 patients were unable to complete the study because of inability to make time. Therefore, the response rate was 97% with a total of 201 subjects.

Table 1 Sociodemographic characteristics of the respondents

Variables	N (%)	Mean (SD)
Sites		
HUKM Primary Care Clinic	121 (60.2)	
Salak Polyclinic	80 (39.8)	
Age (years)		
40-49	72 (35.8)	
50-59	87 (43.3)	53.7 (8.34)
60-69	33 (16.4)	
70-79	8 (4.0)	
80-89	1 (0.5)	
Gender		
Male	97 (48.3)	
Female	104 (51.7)	
Ethnic group		
Malay	142 (70.6)	
Chinese	50 (24.9)	
Indian	9 (4.5)	
Marital Status		
Single	4 (2.0)	
Married	186 (92.5)	
Widow/Divorced	11 (5.5)	
Education		
None	8 (4)	
Primary	53 (26.4)	
Secondary	115 (57.2)	
Tertiary	25 (12.4)	
Occupation		
Unemployed		
Housewife	55 (27.4)	
Pensioner	35 (17.4)	
None	9 (4.5)	
Employed		
Government Servant	24 (11.9)	
Private Sector	43 (21.4)	
Self Employed	35 (17.4)	
Total Monthly Household Income (RM)		
< 1,500	118 (58.7)	
>1,500	83 (41.3)	
Duration of Hypertension (months)		
< 60	128 (63.7)	
61-120	38 (18.9)	79.8 (85.89)
>120	35 (17.4)	
Family History of Hypertension		
Yes	149 (74.1)	
No	52 (25.9)	
Number of Medication Prescribed		
1	132 (65.7)	
2	56 (27.9)	
3	12 (6.0)	

Table 1 shows the sociodemographic characteristics of the respondents. Most of them were in the age group of 40-59 years old, (79.1%). Distribution of the sex was almost equal: female 97 (48.3%) and male 104 (51.7%) and majority of the respondents were Malays 142 (70.6%). Most of the patients were married 186 (92.5%) and only 8 (4%) did not have any formal education.

About quarter of the respondents (27.4%) were housewives. Half of the patients (50.7%) were employed and mostly were working in the private sectors (43.1%). More than half of the patients (58.7%) had a monthly family income of less than RM1500.00. Majority of them,74.1% had a family history of hypertension and 65.7% were on only one type of antihypertensive medication.

Table 2 Distribution of psychiatric diagnosis of the patients using MINI

Diagnosis	Total Cases	Percentage (%)
Major Depressive Disorder	7	58.3
Dysthymia	4	33.4
Major Depressive Disorder with lifetime panic disorder	1	8.3
Total	12	100

Table 2 shows the distribution of specific diagnosis of depressive disorders among the patients. Only 12 patients had depressive disorders (6%). Major Depressive Disorder is the most common (58.3%) type of mood disorder, followed by Dysthymia (33.4%). Only 1 patient had co-morbid Major Depressive

Disorder and lifetime Panic Disorder (8.3%).

The prevalence of non-compliance to drug treatment among hypertensive patients was 38.3% (77). Patients with depressive disorders have 0.78 times at risk to become non-compliant to treatment.

Table 3 Relationship between sociodemographic factors and drug compliance

Variables	OR (95% CI)	LR test (df)	p- value
Age	0.91 (0.445,1.867)	0.06 (1)	0.801
Gender	0.64 (0.365, 1.339)	2.34 (1)	0.127
Ethnic group	0.89 (0.478, 1.640)	0.15 (1)	0.699
Marital Status	1.01 (0.346, 2.963)	0.00 (1)	0.980
Education			
Secondary	1.15 (0.615, 2.171)	0.20 (2)	0.653
Tertiary	1.11 (0.432, 1.912)	0.20 (2)	0.823
Occupation	1.01 (0.574, 1.77)	0.00 (1)	0.976
Total Household Income	0.68 (0.383, 1.202)	1.76 (1)	0.184
Duration of HPT	1.00 (0.998, 1.005)	0.88 (1)	0.351
Family History of HPT	1.00 (0.528, 1.912)	0.00 (1)	0.988
Number of Medications Prescribed			
2	0.84 (0.445, 1.533)	0.31 (2)	0.589
3	0.88 (0.265, 2.926)	0.31 (2)	0.837

OR of education is compared to primary education, while OR for number of medications prescribed is compared to those on monotherapy.

(OR = Odds Ratio, CI = Confidence Interval, LR = Logistic Regression, df = degree of freedom)

Logistic regression was used and there was no significant association between drug compliance and sociodemographic factors (Table 3). However severity of depression has a significant association with drug compliance (z test = -2.083, p=0.037).

Discussion

This study is the first local study done to look into the association between depression and non-compliance in hypertensive patients taking medications. This study found that about

6% of hypertensive patients were depressed. This figure is low as compared to some of the earlier studies in Malaysia [9,13]. However, these studies were on emotional disorders, and not specific for depressive disorders. Findings in this study, however, were to some extent comparable to some of the international studies [14-16] where the prevalence of depression in primary care patients is about 6-10%.

Depression is often cited as one of the factors for non-compliance to treatment. However this study failed to prove this

theory. On the other hand, severity of depression has a significant association with poor compliance. This is consistent with some overseas studies [3,17]. Botelho and Dudrak 1992 [18] in their studies to examine the effect of depression and anxiety on compliance also found that more severe depression was associated with lower drug compliance.

Assessment of compliance to treatment is often difficult. Direct questioning of patients in interviews is a simple and rapid method but inadequate for evaluating medication compliance [19]. The only study done in Malaysia was done by Lim T.O et al 1992 [2] used the Pill Counting method to measure compliance with hypertensive treatment. However, patients who want to avoid showing that they had missed doses may not return unused medication. Therefore, pill counts only provide accurate compliance estimates for compliant patients and the accuracy diminishes among patients with lower compliance rates [21,22]. According to Sackett D.L 1977 [26], 80% compliance with medication is required to achieve a blood pressure reduction and thus a ratio of 0.8 (80%) or more is usually taken as a criterion for adequate drug compliance.

There were a few studies done on the relationship between depression and anxiety with drug compliance. Most of the studies found that higher depression is associated with lower drug compliance in various medical conditions [18,23-25]. Due to the small number of patients who had depressive disorder (12 respondents), the significant association using non parametric Mann-Whitney test could be misleading.

In conclusion, this work may support the idea that severity of depression affects compliance with medical treatment. Therefore, primary care doctors should equip themselves with basic psychiatric knowledge in order to detect depression. Referral to the psychiatrist is needed to ensure that patients receive proper treatment. On the other hand, medical officers in the Primary Care Clinics should be trained to detect psychiatric problems among patients and should update themselves with current management of psychiatric disorders. Psychiatric medications should be made available at all Primary Care Clinics with the involvement of Family Medicine Specialists to reduce patient load at tertiary referral centres.

This study is not without its shortcomings. The urban (HUKM PCC) and rural (Salak Polyclinic) cohorts may not be representative of the general Malaysian population. Further studies are recommended to replicate these findings using a larger sample size. The scope of this result is also limited to patients who were literate in Malay and English languages only. Many patients could not be included in the study due to language barrier, although they fulfilled other inclusion criteria.

Several sampling bias were identified in this study. Due to the author's limited time frame, the samples were followed up only once which was 2 months after they were first seen by the author. Ideally, if there was sufficient time, it would be good if compliance was assessed on at least three visits.

In future studies, it is recommended that the questionnaires be translated into different local languages such as

Mandarin and Tamil to capture other ethnic groups. Another way would be to include the Chinese-speaking or Tamil-speaking researchers who are trained to use MINI.

The author is also aware about the issue of side effects of antihypertensive drugs on compliance. However this issue was not studied. It was actually being addressed in the bigger multicenter national study of which relationship between the side effects and compliance is part of the main objectives.

The effect of antihypertensive drugs on depression and anxiety was also not studied. Most of these drugs are recognized to cause or increase risk to cause depression such as beta blocker, diuretics, methyldopa, and calcium channel blocker.

The low prevalence of depression in this population maybe due to the small sample size. A prospective study with a larger sample size and longer follow-up time is needed in future to establish more definitive link between depressive and anxiety symptoms, and compliance.

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