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Research Article

Cognition and Memory Impairment among Patients of Depression in Pakistan-The Role of Conventional and Newer Anti-Depressants

Madeeha Malik*, Muhammad Usama Khan, Azhar Hussain and Ayisha Hashmi

Hamdard Institute of Pharmaceutical Sciences, Hamdard University, Islamabad Campus, 23-East, Fazal Ul Haq Road, Blue Area, Islamabad, Pakistan

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Abstract

Background: Antidepressant therapy is the most adopted treatment option for depression. The evaluation of cognitive effects related to antidepressant drug use is important for better selection of antidepressant drugs that leads to improved cognitive performance and patient health related quality of life. Aim: The aim of the present study was to evaluate the effects of antidepressant drugs on cognition and memory among patients of depression in Pakistan.

Method: A descriptive cross-sectional study design was used. A pre-validated data collection tool Mini Mental State Examination was used. The sample size was calculated to be 382 with 95% confidence interval and 5% level of error. The data was cleaned, coded and analyzed statistically using spss 21. Chi-Square test ($p \geq 0.05$) was used to find association among different variables.

Results: The results showed that out of 382 respondents, 7.3% (n=28) were being prescribed amytryptyline and among them 46% (n=13) had questionably significant cognitive impairment and 53% (n=15) had mild cognitive impairment. On the other hand out of 23% (n=89) patients on escitalopram monotherapy, 85% (n=76) had impairment of questionably significant impairment and only 13.4% (n=12) had mild impairment. Area of residence and medication therapy were significant variables ($p<0.05$) that can affect cognition and memory among patients of depression.

Conclusion: The results of present study concluded cognitive impairment of questionably significant nature among patients of depression in Pakistan. For the better management of depression, it is recommended that anti-depressant drug therapy should be tailored according to individual patient requirements.

Introduction

Depression is a common mental disorder, characterized by persistent sadness and a loss of concentration in activities that are normally enjoy, convoyed by an inability to carry out daily activities, for at least two weeks. Globally depression affects 20 percent of people while in Pakistan it's more serious with an estimate of 34 percent [1]. It affects women more often than men, and unemployed people are also at higher risk. Its relative disease burden is pronounced in high- and middle-income countries and it is also a major cause of disease burden in low-income countries. Depression can cause the affected person to suffer greatly and function poorly at work, at school and in the family. It is usually associated with change in a number of neurocognitive functions and memory, (such as attention, visuospatial abilities, memory recall, alertness, fatigue, impaired concentration and decision-making) as well as feelings of shame or guilt, and thoughts of death or dying [2]. Antidepressant and psychosocial therapies are most adopted treatment options for depression throughout the world. Studies throughout the world found that newer antidepressants appear to improve cognitive performance while older agents appear to negatively affect the cognition. However, the evidence continues to be limited by few studies and small sample sizes [3].

All antidepressant drugs have potential of causing central nervous system dysfunction and other side effects. Adverse effects associated with the use of antidepressant drugs are one of the leading cause of treatment failure in people with depression and contributing towards negative impact on patient adherence also preclude attainment of fully affective doses. Potential of antidepressant drugs to adversely impact cognition and behavior is of serious concern as these are ma-

***Address for Correspondence:** Madeeha Malik, Hamdard Institute of Pharmaceutical Sciences, Hamdard University, Islamabad Campus, 23-East, Fazal Ul Haq Road, Blue Area, Islamabad, Pakistan, Tel: +92512604385; Email: madeehamalik15@gmail.com

jor therapeutic modalities for depression control [4]. Assessment of cognitive impact of antidepressant drugs in daily life is an important aspect in the depression management and optimization of treatment. Patients treated with multiple antidepressant drugs are at increased risk of cognitive deficits. Sometimes these drugs have adverse effects on memory; thinking and learning ability are more debilitating for the individual patient than the depression. People with depression report significant impact of disease on family dysfunction, reduced social and leisure opportunities and increased level of psychiatric co morbidities with marked reduction in quality of life of individual [5]. Hence, adverse effects of different antidepressant agents on cognition and memory functions impose additional burden on individuals with depression contributing towards reduction of health related quality of life [6].

In the past few decades, these effects were studied worldwide for the better understanding of different factors associated with increased psychosocial burden, but it is still neglected in Pakistan. The evaluation of cognitive effects related to antidepressant drug use is important for better selection of antidepressant drugs that leads to improved cognitive performance and patient health related quality of life. Therefore, the aim of the present study was to evaluate the effects of antidepressant drugs on cognition and memory among patients of depression in Pakistan.

Research Methods and Design

Study design

A descriptive cross-sectional study design was used to evaluate the effects of antidepressant drugs on cognition and memory among patients of depression in twin cities i.e. Islamabad (Federal Capital) and Rawalpindi (Twin City) of Pakistan.

Study sites and setting

Study sites for this research included public and private tertiary health care facilities and neurology clinics located in twin cities of Pakistan.

Study population and sampling strategy

Study respondents included in the study were: depressive patients above 16 years of age, both genders and persons who could easily read and write. Any patient having co morbidity or taking drug that can affect or induce cognition or memory were excluded from the study. Calculation of sample size was performed by Raosoft® sample size calculator to determine the size of sample representing the study population. The calculated sample size was 382 to achieve 95% confidence interval and 5% margin of error. As no National data of depressive patients is available for the country, so convenient sampling technique was used for the study and all the respondents that were available at the time of data collection and willing to participate in the study were selected.

Data collection

Data collection tool: A pre-validated data collection tool i.e. Mini Mental State Examination (MMSE) questionnaire, which is a practical method for grading the cognitive state of patients was used. Written permission was obtained from the respective organization for using the tool. Mini Mental State Examination (MMSE) is a brief clinical test of mental status that consists of total of eleven questions. The MMSE begins with a graded assessment of orientation to place and time; this is followed by testing two aspects of memory. The first is the immediate recall for three objects presented orally, followed by a serial sevens task which is interposed to assess attention, concentration, and calculation, and also to prevent the individual from rehearsing the three objects previously learned. The final section surveys aphasia by testing functions of naming, repetition, understanding a three-stage command, reading, writing and copying a drawing. The MMSE can be easily administered by trained health care professional. The person administering the MMSE is required to be receptive about patient embarrassment if patient was unable to answer these questions. Respondents were informed that this is another way of determining how the treatment is affecting their cognitive abilities. Total score of MMSE is 30. A score range of 0-10 indicates severe cognitive impairment, 11-20 score range indicates moderate cognitive impairment, 21-25 indicates mild cognitive impairment while a score of 26-30 shows cognitive impairment of questionable significance.

Data collection procedure: MMSE was self-administered by principal investigator after obtaining written/verbal consent from the respondents. The questionnaire was collected back on the same day to avoid any study biasness.

Data analysis

After data collection the data was cleaned, coded and statistically analyzed using SPSS version 21. Descriptive statistics comprising of frequency and percentages were calculated. Chi-Square test ($p \leq 0.05$) was used to find association among different variables.

Ethical considerations

Research approval for the current study was obtained from the Ethical Committee of Hamdard University (Ref. No. HU/DRA/2017/554). Moreover in Pakistan, questionnaire based study do not need any endorsement from Ministry of Health. Despite that, prior information was sent to Ministry of Health, Government of Pakistan for the execution of this research. For the collection of data, approval was taken from MS of hospitals (OPDs) and owner of neurology clinics. Informed and verbal consent for participation was also taken from the respondents. The respondents were ensured for the confidentiality of information verbally as well as under taking were signed by the principal investigator.

Results

Demographic characteristics of patients of depression in pakistan

Out of the 382 respondents, 26.4 % (n=101) belonged from age group of 16-20 years of age, 29.5% (n=113) were from 21-30 age group category. Respondents from age group of above 50 were only 8.4 % (n=32). Out of total respondents 43% (n=165) were male and 57% (n=217) were females. Mostly respondents 60.1% (n=230) were married and majorly were having 27.7 % (n=106) primary level of education. Majorly depressive patients were from urban areas 55.4% (n=212) being majorly treated from private sector of treatment 72.8% (n=279) and 26.9% (n=103) from public sector. Family history was positive in 27.9% (n=107) and negative in 71.8% (n=275). Mostly respondents were on 62.15% (n=238) monotherapy. Detailed description is given in table 1.

Interpretation of MMSE score among patients of depression

Out of 382 respondents, 75.7% (n=290) had questionably significant impairment, 21.7% (n = 83) had mild decline in cognition level and 2.3% (n = 9) had moderate cognitive impairment (Table 2).

Table 1: Demographic Characteristics of Patients of Depression in Pakistan.

Indicators		n(%)
Age	16 - 20	101(26.4)
	21-30	113(29.5)
	30-40	94(24.5)
	40-50	42(11)
	>50	32(8.4)
Gender	Male	164(42.9)
	Female	218(57)
Marital Status	Married	230(60.1)
	Unmarried	151(39.4)
Qualification	Primary	106(27.7)
	Matric	69(18)
	Intermediate	83(21.7)
	Bachelor	85(22.2)
	Masters	39(10.2)
Current Income	<10,000 - 20,000	178(46.5)
	21,000 - 35,000	95(24.8)
	36,000 - 50,000	57(14.9)
	>50,000	52(13.6)
Residence Setting	Rural	170(44.4)
	Urban	212(55.4)
Sector Of treatment	Public	103(26.9)
	Private	279(72.8)
Family History	Positive	107(27.9)
	Negative	275(71.8)
Medication Therapy	Monotherapy	238(62.15)
	Polytherapy	144(37.6)

Table 2: Interpretation of MMSE among Patients of Depression in Pakistan.

Interpretation	n(%)
Severe (0-10)	0
Moderate (11-20)	9(2.3)
Mild(21-25)	83(21.7)
Questionably significant(26-30)	290(75.7)

Interpretation of MMSE in relation to various antidepressant drugs

Out of 382 respondents, 7.3% (n=28) were being prescribed amitriptyline and among them 46% (n=13) had questionably significant cognitive impairment and 53% (n=15) had mild cognitive impairment. On the other hand out of 23% (n=89) patients on escitalopram monotherapy, 85% (n = 76) were having questionably significant impairment, 13.4 % (n = 12) had mild impairment in cognition and 1 % (n = 1) had moderate cognitive impairment (Table 3).

Interpretation of MMSE score among depressive patients according to different demographic characteristics

Significant association for cognitive impairment and demographic variables such as residence setting (p = 0.003) and type of medication therapy (p = 0.003) was observed. Hence, residence setting and type of medication therapy might be significant factors that can contribute towards cognitive impairment among depressive patients (Table 4).

Discussion

Depression is among the most frequent health problem being reported in general health-care setting and also a cause of significant disability particularly among the developing countries [7]. Depression either in mild or severe form causes decrements in cognitive abilities and dissociations in perceptual and motor tasks [8]. Hence treating depression is an important component to reduce overall morbidity and disability associated with it.

Depression is the leading cause of disability among women globally with roughly prevalence in the ratio of 2:1. This may be due to multiple factors involving biological factors like hormonal changes and also socio-cultural differences [9]. The results of present study indicated that females were more commonly affected by depression in contrary to men. These findings are in accordance with a study conducted in Pakistan, it reported that rates of depression and anxiety were high among females as compared to that of males in Pakistan [10].

Education and socio-economic status of an individual are also important factors that play role in the development of depression. The findings of present study indicated that respondents having primary level of education were suffering more with depression as compared to respondents having higher level of education. These findings are in accordance with the review study which reported association between lower level of education and higher prevalence of depression [11]. The results of present study also indicated relationship

Table 3: Interpretation of MMSE in Relation to various Antidepressant Drugs.

Drug Used	Questionably Significant (26-30) n (%)	Mild impairment (20-25) n (%)	Moderate Impairment (11-20) n (%)	Severe Impairment (0-10) n (%)
Amitriptyline	13(46)	15(53)	0	0
Escitalopram	76(85)	12 (13.4)	1(1)	0

Table 4: Interpretation of MMSE score among Depressive Patients according to Different Demographic Characteristics.

Indicators		Severe (0-10) n (%)	Moderate (11-20) n (%)	Mild (21-25) n (%)	Questionably significant (26-30) n (%)	p-value
Age	16-20 Y	0	6 (5.94)	18 (17.8)	77 (76.23)	0.094
	20-30 Y	0	1 (0.88)	25 (22.12)	87 (76.99)	
	30-40 Y	0	1 (1.06)	17 (18.08)	76 (80.85)	
	40-50 Y	0	0	12 (28.57)	30 (71.42)	
	>50	0	1 (3.125)	11 (34.37)	20 (62.5)	
Gender	Male	0	5 (3)	30 (18)	129 (78.6)	0.916
	Female	0	4 (1.8)	52 (23.8)	162 (74.3)	
Marital status	Married	0	3 (1.30)	49 (21.30)	178 (77.39)	0.482
	Unmarried	0	6 (3.97)	34 (22.51)	111` (73.50)	
Qualification	Primary	0	5 (4.71)	29 (27.35)	72 (67.92)	0.381
	Matric	0	2 (2.89)	14 (20.28)	53 (76.8)	
	Intermediate	0	1 (1.20)	15 (18.07)	67 (80.72)	
	Bachelor	0	1 (1.17)	17 (20)	67 (78.82)	
	Masters	0	0	8 (20.5)	31 (79.48)	
Current Income	<10,000-20,000	0	6 (3.37)	37 (20.78)	135 (75.84)	0.30
	21,000-35000	0	0	25 (26.31)	70 (73.68)	
	36,000-50,000	0	2 (3.50)	12 (21.05)	43 (75.43)	
	>50,000	0	1 (1.92)	9 (17.30)	42 (80.76)	
Residence setting	Rural	0	7 (4.11)	47 (27.64)	116 (68.23)	0.003
	Urban	0	2 (0.94)	36 (16.98)	174 (82.07)	
Sector of treatment	Public	0	3 (2.91)	20 (19.41)	80 (77.66)	0.703
	Private	0	6 (2.15)	63 (22.58)	210 (75.26)	
Medication Therapy	Monotherapy	0	2 (0.84)	49 (20.5)	187 (78.57)	0.030
	Polytherapy	0	7 (4.86)	34 (23.61)	103 (71.52)	

Chi-square test ($p \leq 0.05$).

between low socioeconomic status and depression development. These findings are consistent with the study carried out in India, which observed higher prevalence of depression among low-socioeconomic group [12].

Depression is associated with cognitive impairment and dementia hence contributing additional burden on depressed individuals. Treating depression using anti-depressants produce positive impact on cognitive abilities and memory. The findings of present study indicated that most of the depressed individuals on anti-depressant drug therapy have minimum level of cognitive impairment. These findings are in-line with the study conducted in Canada, which reported that anti-depressant drugs produce positive impact on cognitive abilities and memory of depressed individuals [13].

Selective serotonin- reuptake inhibitors are now most commonly used for the treatment of depression worldwide. These have safer drug profile because of more selective nature and have more promising effects. The findings of present study indicated that patients on SSRI's suffer less from cognitive problems as compared to respondents on tri-cyclic anti-depressants. These findings are in-line with various studies conducted world-wide, which reported more safer cognitive profile of selective serotonin reuptake inhibitors [14].

Limitations

Time and financial constraints were few of the major limitations faced in conduction of study. Moreover study was conducted in just two cities of Pakistan hence results may not be generalized to other parts of country. Cognition being complex neurological process requires complex cognitive and neuropsychological testing; hence it is difficult to measure cognitive abilities using one tool.

Conclusion and Recommandations

The results of present study concluded cognitive impairement of questionably significant nature among patients of depression in Pakistan. Respondents on newer antidepressants showed better cognitive profile as compared to older ones. Escitalopram was most commonly used antidepressant drug among depressive patients. The study revealed that medication therapy (monotherapy vs. polytherapy) and residance setting had impact on cognition among patients of depression.

For the better management of depression, it is recommended that Anti-depressant drug therapy should be tailored according to individual patient requirements as studies have proved that anti-depressants are not ''one size fit all'' agents. In addition to drug therapy, depression should be tackled using behavioural approaches like cognitive behavioural therapy. Women, being more prone towards the development of depression hence policies should be directed towards women empowerment and reduction of socio-cultural factors responsible for promotion of discrimination. Health professionals should be trained to deal depression according to new treatment guidelines and to also fulfil patient unmet needs.

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