



## NEURO-COGNITIVE PROFILE AND PSYCHIATRIC MORBIDITIES OF PATIENTS WITH BRONCHIAL ASTHMA- A CASE CONTROL STUDY

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### ARTICLE INFO

#### Article History:

Received 15<sup>th</sup> October, 2016  
Received in revised form 7<sup>th</sup> November, 2016  
Accepted 16<sup>th</sup> December, 2016  
Published online 28<sup>th</sup> January, 2017

#### Key words:

Bronchial asthma, chronic medical conditions, psychiatric morbidities, Stressful life events.

### ABSTRACT

**Aim:** To evaluate the cognitive impairment in patients with bronchial asthma. To compare cognitive impairment and prevalence of psychiatric morbidities in patients with bronchial asthma and with healthy controls.

**Method:** This study was done at Allergy and Asthma clinic, the Govt. Stanley Medical College and Hospital, Chennai during the period of 2008-2009.

70 consecutive patients of Bronchial asthma attending allergy and asthma clinic were chosen as the study group.

The healthy attendants accompanying asthmatic patients formed the control group. After matched to the age and sex, socio economic status and marital status, both group were analyzed for cognitive profile and psychiatric morbidities by using Montreal Cognitive Assessment (MoCa) and Multiphasic Questionnaire (MPQ)

**Results:** There is significant decrease in cognitive profile in patients with Bronchial asthma. There is a highly significant difference in the psychiatric morbidity between the study and control groups. Psychiatric morbidity is 3 times more common among the study group when compare to the control group.

**Conclusion:** Bronchial asthma being a chronic disabling condition and also life threatening now and then, because of frequent hypoxic attack it can produce neuronal damage and in turn leads to cognitive impairment. Also it will make the patient psychologically unstable and create a psychiatric problem and also presence of psychiatric morbidities often precipitate asthmatic attacks more frequently. So it is essential to look for cognitive profile and psychiatric morbidities in all asthmatic patients and manage appropriately for better remission of asthmatic attacks.

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### INTRODUCTION

Bronchial asthma is manifested by paroxysms of breathlessness, wheeze and cough due to bronchial hyperactivity to any physical, chemical and biological stimuli characterized by smooth muscle spasm, excessive mucus secretion and mucosal edema. The common features are periodicity, chronicity and reversibility (J.M.Phadtare *et al*). The prevalence is escalating all over the world. In India it is suggested that approximately 6% of the population suffers from asthma. (J.M.Phadtare *et al*). nearly 1/3<sup>rd</sup> of school children in big metropolitan cities are suffering from Bronchial asthma (K.B.Gupta *et al*).

Many studies have shown that bronchial asthma is associated with cognitive impairment (S.Mourad *et al*, L. Schou, *et al*, M. Klein *et al*). A mechanism proposed for the cognitive impairment in asthmatic patients is the neuronal damage mediated by hypoxia as a result of the pulmonary disease or the co morbidities that adversely affect the brain, such as vascular disease and smoking (R.K. Heaton *et al*). Mild cognitive impairment (MCI) is defined as a clinical condition characterized by the decline of cognitive function greater than expected for a certain age and educational level of the individual but not severe enough to interfere with their daily activities (R.C. Petersen *et al*). The Montreal Cognitive Assessment test is an efficient instrument to use for screening, diagnosis and tracking of MCI. It assesses different cognitive

domains, has good psychometric properties and has become a widely used screening instrument for MCI (T. Smith, N *et al*). For many years extensive reports have suggested that psychological factors play an important role in the development of bronchial asthma, in precipitating episodes of asthma and in worsening the course of illness (Jonathan *et al*). In 1966 the authors of popular general medical textbook included the following statement: "Psychological influences play some important role in almost every asthmatic and quite often they appear to be mainly responsible, if not in starting asthma, at least in maintain it. Treatment is not likely to be complete unless these factors are appreciated" (B.D.W.Harrison *et al*).

Many studies (Vamos M *et al*, Dr.B.C.Kaji *et al*, G.M.F Garden *et al*) have found that presence of psychiatric factors in patients with bronchial asthma which make the patients cope badly with their illness which will leads to:

- Increase frequency of asthmatic attacks
- Increase the morbidity or handicap due to asthma
- Increase the denial rate i.e denial of presence of disease itself
- Increase the rate of non-compliance with treatment
- Poor self esteem and in certain cases can even precipitate suicidal ideas and attempt.

Apart from precipitating asthma attacks, the psychiatric factors can themselves be the result of bronchial asthma. The life threatening nature of severe asthma can make the patient psychologically unstable and create a psychiatric problem (E.R.Fadden *et al*).

Hence psychological factors in bronchial asthma can be causal or secondary to bronchial asthma. It is difficult to differentiate between these two (B.J.Barnes *et al*).

There are very limited studies in Indian context regarding the psychiatric profile of bronchial asthma which drive us to do this study.

### Aim

To evaluate the cognitive impairment in patients with bronchial asthma

To assess the prevalence of psychiatric morbidities in patients with bronchial asthma

To compare cognitive impairment and prevalence of psychiatric morbidities in patients with bronchial asthma and with healthy controls

## MATERIAL AND METHODS

This study was done at Allergy and Asthma clinic, the Govt. Stanley Medical College and Hospital, Chennai during the period of 2008-2009.

70 consecutive patients of Bronchial asthma attending allergy and asthma clinic were chosen as the study group.

The healthy attendants accompanying asthmatic patients Allergy and Asthma clinic formed the control group. 70 such healthy subjects matched to the age and sex of the study group were chosen as control group.

Both group were analyzed for socio economic status, marital status, duration of illness and psychiatric morbidities by using

various scales including Montreal Cognitive Assessment (MoCa) and Multiphasic Questionnaire (MPQ)

### Inclusion criteria for study group

Patients with confirmed diagnosis of Bronchial asthma  
Willing to give informed consent

### Exclusion criteria study group

Patient with any other physical illness

### Inclusion criteria for control group

Healthy attendants accompanying asthmatic patients  
Willing to give informed consent

### Exclusion criteria control group

Patient with any physical illness

### Scales used

#### Clinical proforma

Age, sex op numbers, socio demographic profiles were included.

**Montreal Cognitive Assessment:** it is a 30 point test that takes 10 to 15 min to be completed. It assesses several cognitive domains. It assesses visuospatial abilities using a clock drawing task (3 points), and a three-dimensional cube copy (1 point). Multiple aspects of executive functions are assessed using a trail making task (1 point), a phonemic fluency task (1 point), and a two item verbal abstraction task (2 points), Language is assessed using a three item confrontation naming task with familiar animals (3 points) and repetition of two syntactically complex sentences (2 points). Short term memory is evaluated with a task that involves two learning trials of five nouns and delayed recall after approximately 5 min (5 points). Attention, concentration and working memory are evaluated using a sustained attentions task (target detection using tapping, (1 point), digits forward and backward (1 point each) and a serial subtraction task (3 points) at the end of the test, orientation and place is assessed (6 points). A score below 26 points indicates mild cognitive impairment.

**Multiphasic questionnaire:** This is the standard questionnaire accepted internationally to detect psychiatric illness in the primary care medical setting.

The Tamil translated version of this questionnaire is used in this study.

## OBSERVATION AND RESULTS

70 patients in study group and 70 patients in control group were included for this study.

Table-1 Age

Age	Study group n=70		Control group n=70	
	n	%	n	%
<20	9	12.9	6	8.6
21-30	9	12.9	7	10
31-40	36	51.4	40	57.1
41-50	12	17.1	13	18.6
51-60	4	5.8	4	5.6

Chi square = 1.1005, p>0.05 Statistically not significant

There is no statistical difference between the study and control groups with respect to age distribution. This shows that the controls are age matched well with the study group.

**Table-2 Sex**

Variable	Male		Female	
	n	%	n	%
Study group	18	25.7	52	74.3
Control group	20	28.6	50	71.4

Chi square = 0.1445, p>0.05 Statistically not significant

There is no statistical difference between the study and control groups with respect to sex distribution. This shows that the controls are age matched well with the study group.

**Table-3 Marital status**

Variable	Married		Unmarried	
	n	%	n	%
Study group	50	71.4	20	28.6
Control group	54	77.1	16	22.9

Chi square = 0.5982, p>0.05 Statistically not significant

There is no statistical difference between the study and control groups with respect to marital status.

**Table-4 Socio economic status**

Socio economic status	Study group n=70		Control group n=70	
	n	%	n	%
Very high	-	-	-	-
Upper middle class	-	-	-	-
Middle class	14	20	19	27.1
Lower middle class	40	57.1	39	55.8
Very low	16	22.9	12	17.1

Chi square = 1.7479, p>0.05 Statistically not significant

There is no statistical difference between the study and control groups with respect to socio economic status. This shows that the controls are age matched well with the study group.

**Table-5 Assessment of cognitive ability**

	Study group n=70		Control group n=70		Significance
	Mean	SD	Mean	SD	
Montreal Cognitive Assessment score	20.4	4.6	28.4	5.8	P=0.002 Highly significant

In a Montreal Cognitive Assessment scale Mean score of study group is 20.4 whereas mean score of control group is 28.4. This difference is statistically significant, which indicates that there is significant cognitive impairment in study group.

**Table-6 Psychiatric morbidity**

Variable	Psychiatric morbidity present		Psychiatric morbidity absent	
	No of individuals	%	No of individuals	%
Study group	40	57.1	30	42.9
Control group	15	21.4	55	78.6

Chi square = 18.717, p<0.001 Statistically significant

There is a highly significant difference in the psychiatric morbidity between the study and control groups.

Psychiatric morbidity is 3 times more common among the study group when compare to the control group.

Earlier we had seen that socio economic status, marital status, age and sex are the same between study and control group, but there is significant difference in the psychiatric morbidity between the two groups. So it can be said that the socio

economic status, marital status, s age and sex do not influence the occurrence of psychiatric morbidity in the two groups.

**Table-7 Comparison of duration of illness of bronchial asthma with respect to presence or absence of psychiatric illness in the study group**

	Duration of bronchial asthma in patients with psychiatric illness	Duration of bronchial asthma in patients without psychiatric illness
Mean years	8.35 years	8.4 years

t=0.0954,df=68, p>0.05 statistically not significant

there is no statistically significant difference in the duration of illness between asthmatics with psychiatric illness and those without psychiatric illness.

**Table-8 Nature of psychiatric problem**

Nature of psychiatric problem	Study group n=40		Control group n=15	
	n	%	n	%
Depression	17	42.5	7	46.7
Adjustment disorder	11	27.5	5	33.3
Anxiety disorders	9	22.5	3	20
Psychosis	3	7.5	-	-

Among all psychiatric illness, depression is common in both groups followed by adjustment disorder and anxiety disorders.

## DISCUSSION

There is significant decrease in cognitive profile in patients with Bronchial asthma and also there is a highly significant difference in the psychiatric morbidity between the study and control groups.

Psychiatric morbidity is 3 times more common among the study group when compare to the control group.

Earlier we had seen that socio economic status, marital status, age and sex are the same between study and control group, but there is significant difference in the cognitive impairment and psychiatric morbidity between the two groups. So it can be said that the socio economic status, marital status, age and sex do not influence the occurrence of cognitive impairment or psychiatric morbidity in the two groups.

Studies done earlier have shown that high level of cognitive impairment and psychiatric morbidity among asthmatics (Francoise Basset *et al*, Paul W *et al*, Garry R *et al*). This study also shows similar finding was noted. In this study 57.1% of the asthmatics had psychiatric morbidity.

The pattern or the type of psychiatric illness suffered by both the study and control groups are the same i.e, they both have depression to be their commonest psychiatric illness. The other common illnesses in both the group were adjustment disorder and anxiety disorders. Though the pattern of psychiatric illness was the same between the two groups of variables depression, adjustment disorders and anxiety disorders were more commonly found in the asthmatics than in the healthy controls.

## CONCLUSION

Bronchial asthma being a chronic disabling condition and also life threatening now and then, because of frequent hypoxic attack it can produce neuronal damage and in turn leads to cognitive impairment. Also it will make the patient psychologically unstable and create a psychiatric problem and also presence of psychiatric morbidities often precipitate

asthmatic attacks more frequently. So it is essential to look for cognitive profile and psychiatric morbidities in all asthmatic patients and manage appropriately for better remission of asthmatic attacks.

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