

Immunoglobulin levels in manic patients

Abu Baker¹, A. F. M. Nazmus Sadat¹, Md. Iqbal Hossain²,
Sk. Nazrul Islam³ and Abul Hasnat²

¹Department of Pharmacy, University of Asia Pacific, Dhanmondi, Dhaka, Bangladesh

²Department of Clinical Pharmacy and Pharmacology, Faculty of Pharmacy, University of Dhaka, Bangladesh

³Institute of Nutrition and Food Sciences, University of Dhaka, Bangladesh

ABSTRACT: The aim of this study was to determine the serum immunoglobulin concentration in both manic patients and in healthy volunteers. The study was conducted with 30 manic patients (24 males and 6 females, aged 55.4 ± 13.0 years); age and gender-matched, control subjects were enrolled. An enzyme-linked immunosorbent assay (ELISA) was employed to analyze the serum immunoglobulin concentrations. IgG level was found to be 18.22 ± 6.42 g/L in the manic patients, while it was 16.05 ± 3.45 g/l in the cohort controls ($p=0.487$). IgM and IgA concentrations were 6.025 ± 1.07 g/l and 1.41 ± 0.51 g/l in the manic patients, whereas those were 5.73 ± 1.63 g/l ($p=0.688$) and 0.837 ± 0.36 g/l ($p=0.034$) respectively in controls. From the results it was found that only the serum concentration of IgA was increased significantly ($p=0.034$) in manic patients while the concentrations of IgG and IgM remained unchanged. In many psychiatric disorders, immunoglobulin level has been found to be changed significantly. This study reveals that the concentration of IgA in manic patients increased significantly ($p=0.034$) which usually happens in case of many psychiatric patients. Further studies are suggested with larger population to find out the correlation between immunoglobulin level and degree of disorder and possibility of using as a diagnostic tool for the identification of this disease.

Keywords: Immunoglobulin, manic, psychiatry.

INTRODUCTION

Mania is an abnormally elated mental state; typically characterized by feelings of euphoria, lack of inhibitions, racing thought, diminished need for sleep, talkativeness, risk talking and irritability.¹ Mania symptoms include uncontrolled speech, sexual indiscretion, increased substance abuse, or making foolish business investments.² In extreme cases, mania can induce hallucinations and psychotic symptoms.

Mania is frequently associated with behavioral disturbances that can have serious consequences for patients and those around them. Rapid control is important, even though many manic patients are uncooperative. As time goes by and behavioral problems decrease, the type and intensity of treatments change, as do the goals for therapy. Others factors come into play, including the involvement and education of family. Through all phases of illness, the clinician needs to be vigilant about suicide risk.¹

The basic function of immunoglobulin is to help the body protect itself against potential pathogens. Levels of immunoglobulins are affected greatly in various diseases and are being used as an indicator for many diseases. Immunoglobulin has always been

Correspondence to: Abul Hasnat
Tel: 880-2-9667850; Fax: 880-2-8615583
E-mail: ahasnat99@yahoo.com

the subject of research in finding the relationship with psychotic disorders and enormous works have been done in this respect. For instance, decreased levels of IgG can indicate Wiskott-Aldrich syndrome (WAS), a genetic deficiency caused by inadequate synthesis of IgG and other immunoglobulins.³ Decreased IgG can also be seen with AIDS and leukemia.⁴ Concentrations of immunoglobulin are also altered in different types of tumors and showed an increase in brain tumors.⁵ In some neurological diseases, IgA is locally synthesized in cerebrospinal fluid.⁶ A significantly higher incidence of antibodies with affinity for dopamine was found in the group of psychotic patients compared with the neurological control group.⁷

MATERIALS AND METHODS

Subjects. A total of 60 samples including 30 manic patients and 30 healthy volunteers were included in this study. Patients were diagnosed according to DSM-IV and ICD-10 criteria and were randomly collected from outdoor section of Bangabandu Sheikh Mujib Medical University. Duration of the study was six month. Informed consent was obtained from every subject prior to the study. All patients with manic disorder were found to have no evidence of other diseases. The mean age of the patients (24 males, 6 females ranging from 15 to 36 years) was 21.00 ± 6.50 years. The controls (22 males, 8 females ranging from 18 to 40 years) were selected after general physical examinations, and had an average age of 22.0 ± 6.68 years. The two groups were matched for age and sex. The consecutive sampling method was used to recruit the manic patients. The cohort controls were selected in such a way so that the manic patients and healthy controls were equivalent in-group percentages of age, height and socio-economic parameters.

Blood specimens and an interviewer-administered questionnaire were used as research tools. The questionnaire was designed to include smoking habit, educational status, occupation, nutritional status and socio-economic information. Patients and controls were categorized in terms of

occupation such as office worker, housewife, and laborer or others. The study subjects were briefed about the purpose of the study and written consent was obtained from each of them. Socio-economic information was recorded at the time of administration in the hospital. Blood specimens were then collected. Information was collected confidentially during hospitalization under the direct supervision of a psychiatrist. Ethical permission was obtained from both BMRC and the Director of the Bangabandu Sheikh Mujib Medical University Hospital, Dhaka.

Blood Analysis. A venous blood sample (5 ml) was collected from each of the manic patients & healthy volunteers in fasting condition and kept for one hour at room temperature.⁸ Blood was later centrifuged for 20 minutes at 3000 rpm, distributed into 100 μ l aliquots and stored at -80° C until further analysis. Aseptic conditions were maintained during above procedures.

Immunoglobulin Profiling. The serum immunoglobulin was estimated by a quantitative turbidimetric method.⁹⁻¹¹ In this method anti-human antibodies were mixed with samples containing IgG, IgA and IgM. These antibodies form insoluble complexes. These complexes cause an absorbance change depending on the immunoglobulin concentration of the patient's sample which was quantified by comparison from a calibrator of known immunoglobulin concentration. Serum immunoglobulin levels were estimated by solid phase indirect enzyme-linked immunosorbent assay (ELISA), as described by Islam.⁸ Absorbance was recorded at 550 nm for IgG and IgA and at 405 nm for IgM. Calibrator and standard were purchased from Chronolab, Switzerland.

Statistical Analysis. SPSS software package (Version 11.5, SPSS Inc. Chicago, USA) was used to analyze the data. Descriptive statistics were used for all variables. Values were expressed as percentage, mean and standard deviation. Comparison of immunoglobulin for manic patients to that of the cohort controls were performed by cross-table variables and independent sample t-test.

RESULTS AND DISCUSSION

From socio-economic data it was found that out of 30 manic patients, 16.67% (n=5) were illiterate, 16.67% (n=5) were secondary educated, 40% (n=12) were higher secondary educated and the rests were graduates and above (26.67%, n=8). Among the patients 50% (n=15) were student, 26.67% (n=8) were service holder, 6.67% (n=2) were small businessmen and 16.65% (n=5) of the patients were house wife. 33% (n=10) of the patients had monthly income of US \$ 0-50, 26.67% (n=8) had an income of US \$ 51-100, 20% (n=6) had an income of US \$ 101-150, 13.33% (n=4) had an income of US \$ 151-200 and 6.67% (n=2) of the patients had monthly income of US \$ 200 and above. We had also found that only 13.33% (n=4) of the patients were habituated with smoking, 46.67% (n=14) were partially smoker and 40% (n=12) were non smokers. It was observed that 46.67% (n=14) of the patients

were married, 53.33% (n=16) were unmarried and none was divorced.

The mean weight of manic patients was 53.13 ± 8.05 kg, whereas the mean weight of the control was 66.03 ± 11.09 kg. From independent t-test analysis, it was found that weight of the manic patients was changed significantly than those of the controls (p=0.03).

From immunoglobulin analysis IgG level was found to be 18.22 ± 6.42 g/L in the manic patients, while it was 16.05 ± 3.45 g/L (p=0.487) in the cohort controls. IgM and IgA concentrations were 6.025 ± 1.07 g/L (p=0.688) and 1.41 ± 0.51 g/L (p=0.034) in the manic patients, whereas those were 5.73 ± 1.63 g/L and 0.837 ± 0.36 g/L respectively in controls (Table 1). The result showed that only the serum concentration of IgA was increased significantly in manic patients than that of the controls (p=0.034).

Table 1. Serum immunoglobulin levels in manic patients (n=30) and healthy volunteers (n=30).

Parameter Immunoglobulin (g/L)	Patient			Control			P-value
	n	%	Mean \pm SD	n	%	Mean \pm SD	
IgG							
<15	18	60		4	13.33		
15 – 20	6	20	18.22 ± 6.42	14	46.67	16.05 ± 3.45	P = 0.487
>20	6	20		12	40.00		
IgM							
< 5	6	20		16	53.33		
5 – 7	18	60	6.025 ± 1.07	8	26.67	5.73 ± 1.63	P = 0.688
>7	6	20		6	20.00		
IgA							
<1	24	80		4	13.33		
1 – 2	6	20	1.41 ± 0.51	22	73.33	0.837 ± 0.36	P = 0.034
>2	0	0		4	13.33		

This finding is in good match with previous finding which suggested an increase in serum IgA level in the etiopathogenesis of the manic disease.¹² Results also showed that the concentration of serum IgG and IgM in manic patients was not significantly changed (p=0.487 & p=0.688) than that of the cohort controls. But previous studies showed significant increase of serum IgG concentration in manic patients which is contradictory with our finding.¹³ Interestingly another study also depicted significant decrease in serum IgG and IgM level in manic patients as compared with controls.¹⁴ There are, in fact many conflicting results

concerning the immunology of manic patients in previous studies. Weisse reported no difference in lymphocyte function or numbers of T and B cells and antibody production between bipolar patients and a control group, suggesting that bipolar patients do not exhibit reduced immune function.¹⁵

REFERENCES

1. Abrams, E., Lassiter, J. W., Miller, W.J., Neathery, M. W., Gentry, R.P. and Blackmon, D. N. 1977. Effect of normal and high manganese diets on the role of bile in manganese metabolism in calves. *J. Anim. Sci.* **45**, 1108.

2. Bauer, M., Alda, M. and Priller, J. 2003. Implications of the Neuroprotective Effects of Lithium for the Treatment of Bipolar and neurodegenerative Disorders. *Pharmacopsychiatry*. **36**, 250-254.
3. Park, W. S., Kim, C., Kim, N., Joo, H., Youm, J. B., Cuong, D. V., Park, Y. S., Kim, E., Min, C. K. and Han, J. 2005. Modulation by Melatonin of the Cardiotoxic and Antitumor Activities of Adriamycin. *J Cardiovasc Pharmacol*. **46**, 200-210.
4. Huerta, D., Cohen-Feldman, C. and Huerta, M. 2005. Education level and origin as predictors of hospitalization among Jewish adults in Israel: a population-based study. *Harefuah*. **144**, 407-412.
5. Demerec, M., and Hanson, J. 1951. Mutagenic action of manganous chloride. Cold Spring Harbor Symp. Quant. Biol. **16**: 215-228.
6. Lane, H. Y., Lin, Y.C. and Chang, W. H. 2000. Mania induced by risperidone: dose related? *J. Clin. Psychiatry*. **59**, 85-86.
7. Bergquist, B. P. and Kuipers, L. 1993. The predictive utility of expressed emotion in schizophrenia: an aggregate analysis. *Psychological Medicine* **24**, 707-718.
8. Islam, S. N. 1994. Stomach cancer: production human antibodies and cell lines and characterization of a tumour-associated antigen. PhD thesis, Department of Immunology, University of Strathclyde, Glasgow.
9. Dati, F., Schumann, G. and Thomas, L. 1996. Consensus of a group of professional societies and diagnostic companies on guidelines for interim reference ranges for 14 proteins in serum based on the standardization against the IFCC/BCR/CAP Reference Material (CRM 470). *Eur J. Clin. Chem. Clin. Biochem*. **34**, 517-520.
10. Tietz, N. W. 1983. Clinical Guide to Laboratory Tests. Edited by Q B Saunders Co., Philadelphia, 483.
11. Pesce, A. J. and Kaplan, L. A. 1987. Methods in Clinical Chemistry. The CV Mosby Company. St. Louis MO.
12. Tudorache, B. Balaita, C. and Christodorescu, D. 1991. Serum immunoglobulin (A, G, M) levels in primary bipolar affective disorders. *Rom J Neurol Psychiatry*. **29**, 35-51.
13. Legros, S., Mendlewicz, J. and Wybran, J. 1985. Immunoglobulins, autoantibodies and other serum protein fractions in psychiatric disorders. *Eur Arch Psychiatry Neurol Sci*. **235**, 9-11.
14. Ahmed, M., El Sayed, G. and Ibrahim, W.F.A.A. 1999. Immunological study of manic patients. *German J. Psychiatry*. **2**, 48-60
15. Weisse, S. C. 1992. Depression and Immunocompetence: A Review of the Literature. *Psychological Bulletin*. **3**, 475-489.