

## Identifying the Personality Patterns in Patients with Multiple Sclerosis (MS)

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### Abstract

**Introduction/Background:** According to high prevalence of psychological symptoms and personality disorders in patients with Multiple Sclerosis (MS) and increasing rate of such a disease at young and early adulthood ages, identification and performing adequate treatment approaches can be of first priorities of Mental Health System of the country.

**Aim & Objective:** Present investigation aims to address and specify abundance, personality patterns and psychological symptoms in patients with Multiple Sclerosis (MS).

**Methods/Study Design:** This research is an analytical study (i.e. case-control) with random sampling. Tastings include 94 patients with MS and 94 persons of their relatives are selected as controls. Abundance and personality patterns are assessed using Million Clinical Multiaxial Inventory (MCMI-II). Data is analyzed through t-Test with independent samples and Mann-Whitney test.

**Results/ Finding:** Yielded results reveal that patients with MS obtained a score equal to personality disorder at least in one of the personality patterns of MCMI-II test. In a comparison between both patient and controls groups' scores, group of patients with MS has higher averages in all scales, though there seems significant difference in only three scales as follows: Avoidance Scale ( $P<0.03$ ), Aggressive – Passive Scale ( $P<0.01$ ), and Border Scale ( $P<0.02$ ). In the comparison between both groups' average at clinical scales, patients with MS show higher mean than controls where there seems significant statistical difference in some scales as follows: Anxiety Scale ( $P<0.009$ ), somatization disorder Scale ( $P<0.04$ ),

Alcohol Dependence Scale ( $P<0.01$ ), Thought Disorder Scale ( $P<0.002$ ), and Major Depression ( $P<0.005$ ).

**Discussion/Conclusion:** Considerable abundance of personality pathologic patterns and clinical syndromes in patients with MS emphasizes on importance of psychiatric and psychological methods in line with neurological treatments. Also, such patients can receive more targeted psychiatric and psychological services.

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**Key words:** Multiple Sclerosis (MS), Personality Disorders, Clinical Syndromes

## **Introduction**

Multiple Sclerosis (MS) is known as one of chronic diseases in the world which begins from initial and middle adult ages (20 to 40 years old). The disease is one of the most common and important neurological disorders, so that its prevalence has been estimated in US as 300,000 people<sup>1</sup>, but based on Harrison's Internal Medicine (2008) it has been extended to 2.5 million people in the world and 350,000 ones in US. Given Iranian MS association announcement, there are more than 7000 patients with MS in Iran. Also, with respect to Dr. K. Alikhani's researches, the disease prevalence in Iran is belonged to 20,000 to 30,000 people.<sup>2</sup> Some of the most important risk factors of MS disease are as follows: sexuality (in women twice more than men), genetic factors, distance from the equator (further distance from the equator, higher MS disease prevalence), and high economic-social status.<sup>3</sup> As one of the striking symptoms of the disease we can count disturbance in central nervous system which is concerned with quite or relative losing of sheath including axons of the brain white matter and spinal cord. Abnormalities and disorder in the brain surface is usually restricted to the regions where nerve fibers with myelin are moving on surface. In engaged regions, several lesions are observed with specific limits, slightly sunken, glass-like, dark gray, with irregular shapes which are called plaque. In an active plaque, some evidences about degradation of myelin and plenty of macrophages are seen which include myelin debris. In lesions' center, axons remain relatively intact, though their number might be reduced. When plaques are inactive, Inflammation is almost gone and get hidden and leaves very little myelin (perhaps, myelin is removed completely). There may be also shadow plaques which are formed in the unknown location of the boundary between healthy and affected white matter. In this location, thin myelin sheaths can be seen (particularly in outer edges) which evolves the fact that in this border region, myelin has not been removed completely or it has been reformed relatively.<sup>4</sup> There are increasing evidences proving role of Epstein - Barr virus (EBV) in incidence of the disease. Also, lots of experimental and epidemiologic studies emphasize on such a relationship.<sup>3</sup> Safety mechanisms focused on myelin antigens based on pathophysiology form Neurological symptoms of the disease. Apparently, viral factors and other motivating agents cause to destruct blood brain barrier (BBB) and stimulate T cells entry and antibodies into central nervous system. Being naked axons of myelin leads to nerve conduction velocity slow and such pathology will result in onset of the disease symptoms<sup>5</sup>. Initial symptoms of MS are non-specific and heterogeneous and can include a wide range of sensory, body, ocular and motor symptoms.<sup>1</sup> The most common neurological symptoms are Paracentesis (37%), Gait disturbance (35%), abdominal reflexes presence (81%), and Hyperreflexia (76%), but a long list of neurological symptoms and syndromes can occupy

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picture of this Disease.<sup>5</sup> Assessments of Lotfi and Aleyasin show that sensory and ocular disorders are of the most common symptoms among Iranian patients with MS.<sup>6</sup>

What makes such a chronic neurological disease important in psychiatric field is the wide and broad spectrum of neurological- psychiatric aspects. In performed assessments, about 5% of patients showed an acute psychological disorder<sup>1</sup> which was estimated<sup>1</sup> percentage in the assessments of Dr. Soltanzadeh et al.<sup>7</sup> We can name depression, fatigue, anxiety, etc. as the most prominent psychological symptoms in the patients with MS. Fatigue is one of the most common demonstrating symptoms in MS which is substantially related to disabilities and inadequate living conditions in such patients.<sup>8</sup> Fatigue is one of the main symptoms among 80% of patients with MS which got worse during the day. Patients often learn how to change their life style. Etiology of such a fatigue is interested by researches. It does not seem that depression is so related to fatigue, though fatigue in depression is so frequent. A broad spectrum of psychiatric symptoms in MS reveals that depression is one of the most leading ones among behavioral and mood symptoms so that 20 to 50 percent of patients with MS experience major depression in a period of their illness.<sup>1</sup>

Depression occurrence and also major syndrome incidence are not influenced by disease severity, location of lesions involvement, type of neurological symptoms and severity of disability in patient, though depression causes more disability and makes the illness more serious.<sup>9</sup> Yousefipour in 2002 reported depression occurrence in 67% of female patients with MS.<sup>10</sup> Studies show that in addition to fatigue and mood disorders, a broad of psychiatric symptoms (e.g. psychosis, syndromes of delirium, anxiety, personality disorders and cognitive disorders) can also be demonstrated in the patients with MS.<sup>11</sup> Personality changes are also frequent in such patients so that 20-40 percent of patients with MS apparently are engaged with increased irritability or apathy as secondary changes in personality.<sup>2</sup> Based on three neurological-psychological tests emphasizing on executive control, show that such changes have a neurologic origin and are considered as a type of frontal lobe syndrome.<sup>12</sup> Through making depression, cognitive and personality changes, and the disinhibiting caused by that can be taken into account as a disorder in axis III like a risk factor in suicide. Regarding cognitive disorders, researchers suggest that 70% of the patients, based on a group neuropsychology tests, have cognitive defects. These defects, like other neurological-psychiatric symptoms, do not have direct relationship with severity of disability and disorder, though cognitive defects can highly be related to dysfunction and poor level of living. All aspects of memory, information analysis process, executive performance, sub cortical dementias, impaired concentration and attention are of the cases observable in the disorder.<sup>1</sup> In a study performed by Moos Rudolf in 2004, using MMPI personality test, result show that patients with rheumatoid arthritis, tuberculosis and multiple sclerosis are accompanied with new general symptoms such as lack of Water fall Igo power, self-dissociation, self-distance, isolation from others, anxiety and hostility, overall symptoms of psychosis, impulse control problems, the specific personality traits such as prejudice, racism, ethnic affiliation and dependence.<sup>13</sup> But regarding psychiatric issues of MS disease, most of the focus in performed studies and researches is caused by mood effects of the disease which is originated by its high prevalence among patients with MS. Kanner et al. estimated depression prevalence as 20 to 50 percent among such patients<sup>14</sup>; and Turner in 2006, followed by Cohort study on 445 patients with MS in US Northwestern states, using Personal History Questionnaire (PHQ) concluded that suicide thoughts is common among these patients and depression severity is the best sign of such dangerous occurrence possibility.<sup>15</sup> Benedict and et al by suing HES and NEO scale reveal that characteristics of nervousness, lack of sympathy sense, credibility,

respect the conscience of the patients are considerable relative to controls.<sup>16</sup> Nelson in 2002 using MMPI test demonstrate that most of the changes in the specifications of this test are concerned with hypochondriasis, dramatic, and psychosis where findings remain considerably fixed in reassessments performed after a year.<sup>17</sup> Christopher Christodoulou estimates avoidable temperament in patients with MS higher than that of healthy people<sup>18</sup>. Arias Reich's study is about pre-morbid personality of the persons who will later be with MS. In such 5 years duration study performed on 37 patients with MS, based on computer-aided edit of MMPI-II test, he concludes that some personality traits (e.g. operational and objective thought, difficulty in separating the internal and external spaces, tendency to isolation and introversion, difficulty in expressing emotions, anhedonia, alexithymia, high level of cultural, crudity and childhood-like behavior and inflexibility) are significantly common in the persons who will later be with MS<sup>19</sup>.

In an investigation conducted by KoroStil et al. on 140 patients, the prevalence of anxiety disorders (MS 36.3%, Panic disorder 10%, Obsessive Cullen Disorder (OCD) 8.6%, and Generalized Anxiety Disorder (GAD) 18.6%) during the life of patients has been reported, while in mentioned study 75% of patients were suffering specifically an anxiety disorder during the investigation.<sup>20</sup> In another study by Harel et al. in 2007, psychopathology with MS disease was reported of 67 percent, while studied subjects were with such disorders as psychosis (28.6%), personality disorder (4.7%), mood disorder (19%), and decline in cognitive abilities (14.3%).<sup>21</sup>

A study was conducted by Shabani et al. in 2007, in order to evaluate abundance of OCD symptoms in patients with Multiple Sclerosis. In this study, a total of 40 patients with MS were evaluated by Bill-Brown OCD scale and Hamilton depression scale. 17.5% of patients were with OCD and 69.2% were with depression disorder ( $P < 0.001$ ). Age average of patients with OCD was 32.1 years old and MS diagnosis period average is 9.6 years. Average age of patients with depression disorder is 33.1 years old and MS diagnosis period average is 6.2 years.<sup>22</sup>

Recent developments and improvements in performing individual treatments in the world and also Iran have had a substantial influence on the disease prognosis. However, paying attention to cognitive, emotional and behavioral vulnerabilities in the patients with MS, generally in the form of mental disorders and individually in personality disorders form can allow us to utilize diagnostic and therapeutic facilities as best as we can and also to plan therapeutic strategies to reduce mental stress of such patients. Undoubtedly, it would be a pity that patients with MS might not take advantages of, in terms of psychological vulnerability, personality and especially therapeutic developments; hence, present investigation evaluates personality patterns and clinical syndromes of these patients in order to reach such goals.

## **Method**

Present research is an analytical study (case-control) whose target community is all patients with MS who have referred to three clinics including Personal Clinic of Neurology, Academic Clinic of Neurology, and MS Specialized Clinic in Tehran. Through random sampling method, 94 people are chosen among all patients referred to above clinics who are with MS based on clinical evidence and expert neurologist's cognition, then 94 people of their relatives are selected as controls that are same with the patients in terms of sexuality,

age and education but without any neurologic and psychiatric disorders. Exclusion criteria are as follows: 1. With any neurological disorder other than MS, such as epilepsy, degenerative diseases, the pyramidal tract illness and mental retardation, brain tumors, 2. Acute phase of disease (Less than one month before the last acute attack of the disease). 3. Less than one month being under treatment with steroids, 4. During the test, less than one week being under treatment by benzodiazepines with therapeutic doses, 5. At most 5 years before MS diagnosis engaged with major axis I psychiatric disorders, 6. Ages below 18 and above 60 years old, 7. Education lower than guidance school certification, 8. Drug abuse.

Through available documents of Neurology Clinic patients, we make call with the patients and after describing about goals of the research and make them satisfied, an appointment is arranged with them to reply the inventory questions while referring to Clinic. Also, the relatives are asked to fill the inventory during this interval. In order to appreciate ethical principles, through a written consent regarding patients' agreement to participate in the research, the patients and their relatives are assured that obtained information will be quite secret. Furthermore, as thanks for the cooperation of participants in this research, a free psychiatric visit is considered for them or any one introduced by them. In this study, documents 118 patients with MS are evaluated which 99 people are qualified, based on exclusion criteria, to attend in the investigation that after filling the inventories, 5 cases were invalid so that ultimately, 94 patients are qualified to participate in study.

Data collecting tools are personal information questionnaire and Million Clinical Multiaxial Inventory (MCMI-II) which is an objective questionnaire provided by Theodore Million (Clinical Psychologist and Personality Theorist) in 1987 to measure personality disorders. This inventory has been built based on biological-psychological-social theory of Million and in accordance with DSM-III-R which includes 13 scales of personality disorders (axis II) and 9 scales of clinical syndromes (axis I) and 4 scales of correction and adjustment. The conditions for performing the test are having at least 18 years of age and 8 grades of education (i.e. the ability to write and read) which is often done individually. The inventory is consisted of 175 short and self-descriptive sentences whose answers are either yes or no. The required time to complete is about 30 minutes.<sup>23</sup> The test has been translated by KhajeMoogahi and Dr. Barahani in 1993 which has reported test-retest validity between 0.70 to 0.92 and reliability coefficient between 0.78 to 0.89, while Million (1987) has gained the inventory's test-retest validity and reliability coefficient of 0.82-0.96 and 0.59-0.94, respectively. Grading the test is performed in 16 steps, and the last step is to draw profile using scaled scores where elevation scores higher than 85 in each factor show a disorder presence.<sup>24</sup> To analyze data in the items where data are in accordance with and without normal distribution, independent t test and Mann Whitney test have been used, respectively that all the calculations have been performed by SPSS software.

## **Results**

Present research includes two groups as MS patients and the controls where there are 22 men (23.4%) and 72 women (76.6%) in patients' group and 23 people man (25%) and 71 people women (75%) in the controls' group. In terms of age, there are 5 people between 18-20 years old (2.7%), 76 people between 30-40 years old (40.4%), 69 people between 30-39 years old (36.7%), 34 people between 40-49 years old (18%) and 4 people between 50-59 years old (2.1%). Age average and standard deviation in patients and controls are 33.03±8.9 and

33.6±8.9, respectively, where no significant statistical difference can be seen ( $p>0.05$ ). These findings show that the most common age is about 30 to 49 years. Education level in both groups has been reported as follows: High School grade (9.5%), Diploma and associate degree (48.4%), BA, MA and PhD (40.2%).

Average and standard deviation of 13 personality disorders scales and 9 clinical scales in both groups have been compared whose results are presented in Table 1 and Table 2. As can be seen, average and standard deviation at all personality scales and clinical syndromes in MS patients are higher than those in the controls where the statistical difference is significant in three scales of personality patterns including avoidance, aggressive - passive and border scales and five scales of clinical syndromes including anxiety, somatization disorder, alcohol dependence, thinking disorder and major depressive.

Table 1 shows mean scores of both groups. As can be seen, other than narcissistic scale, patients group mean scores show more elevation than those in the controls. The highest averages in patients group are respectively related to the scales as: schizoid, dramatic, aggressive - abusive, forced, paranoid, anxious, somatization disorder, dysthymic and delusional disorder. Also, general profile pattern of patients with MS are the same as controls and are in normality range (all the scores are below 85), thereby it cannot be argued that patients with MS have a specific personality profile.

Comparison of personality patterns disorders and clinical syndromes in both groups show that patients have higher percentages than controls where the highest statistics are related to some scales including dramatic (18.3%), aggressive – abusive (26.7%), forced (50%), aggressive – passive (26.7%), anxiety (43.3%), and dysthymic (20%).

Comparison of mean scores of men and women with MS in Million inventory scales show that there is a significant difference between men and women in some scales including dramatic, antisocial, aggressive- abusive, somatization disorder, and alcohol dependence; also, men have higher scores in some scales as antisocial ( $75.21 \pm 15.96$ ,  $P<0.02$ ), aggressive –abusive ( $86.64 \pm 20.23$ ,  $P<0.02$ ), and alcohol dependence ( $61.93 \pm 17.35$ ,  $P<0.03$ ), and women have higher scores in some scales as dramatic ( $73.68 \pm 12.50$ ,  $P<0.02$ ), and somatization disorder ( $73.15 \pm 15.71$ ,  $P<0.03$ ).

Comparison of average and standard deviation of above 40 years old patients with below 40 years old ones show that former group of patients have higher scores in alcohol dependent and aggressive - abusive scales than latter one which is statistically significant, but in other scales there seems no significant difference. Average and standard deviation of patients with MS in the illness duration (5 years and higher, lower than 5 years) are compared. Results reveal that, in some scales including aggressive - abusive, border, anxiety, thought disorder and major depression, the patients with 5 years illness duration and higher have different statistical significance relative to the patients with lower than 5 years illness duration [Table 2]. Finally, figure 1 shows personality profile in MS group and control group.

## **Discussion**

Regarding psychiatric issues of MS disease, most of the focus in performed studies and researches is caused by mood effects of the disease which is originated by its high prevalence among patients with MS.

Studies by previous researchers, including: Yousefipour, Kanner and Turner showed the greatest impairment in patients with multiple sclerosis is depression. According to results yielded in this investigation, patients with MS in five clinical scales (i.e. anxiety, somatization, depression, alcohol dependence and impaired thinking) gained higher scores in comparison with control group where such a difference was significant. KoroStil in 2007 confirmed the result that 75% of patients with MS were also with anxiety disorders. Shabani's study also indicated that OCD and depression disorders are highly existed in patients with MS.<sup>20</sup>

Also, in present study, mean scores of patients with MS in three scales of avoidant personality, aggressive – passive, and boundary were higher than those of control group and there was a significant difference. Avoidance personality patterns mean scores have a significant difference with those of controls, furthermore on the other hand, forced personality patterns- emphasizing on insistency and perseverance- is higher in the control group than the patients and this result is compatible with lots of previous studies. Christopher Christodoulou estimates avoidable temperament in patients with MS higher than that of healthy people while such estimation shows less insistency this. Also another researchers as Rudolf Mose, Korostil and Nelson approve these findings.

In studying of Benedict lower mean scores of some personality patterns like narcissistic and forced and higher border personality pattern scores in this paper can be known in line with these findings. The final result of Arias is as follows: some personality profiles and traits are common among the persons who will later be with MS and this fact can present a possible relationship between previous character and incidence of such a disease.

Significant difference of in abundance between the clinical syndromes of patients with MS and controls has been expectable and reveals that MS disease is concerned with psychiatric axis I disorders. But this study cannot present cause and effect relationship, however, stronger psychiatric axis I disorders relationship with MS disease relative to abnormality personality patterns in present paper is in line with previous studies. Above mentioned findings have been also repeated typically in many chronic diseases which can show a general relationship between axis I disorders with debilitating chronic diseases. In this research, 43.3% of the patients with MS have shown anxiety in disorder level in terms of obtained scores at Million inventories which is homogenous with previous studies and also study performed by Shabani et al (2007). Dysthymic disorder is 20% for the patients in this study, i.e. equal to that in Conner study, but it is lower than the percentage mentioned in other same investigations and it is interesting to note that no Mania is obtained in this research, unlike other studies.

Another finding of this research addresses patients with MS having higher than 40 years old in personality scale of dependent and aggressive- abusive in comparison with patients having lower than 40 years old and such a difference is significant. While, Shabani's studies revealed that average age of patients with MS having OCD and depression disorders was about 32 years old. On the other hand, results of present study indicated that if MS period is higher than 5 years then depression, anxiety, thought disorders, borderline personality, and aggressive – abusive scales will increase significantly.

In Shabani's study, period of MS diagnosis in patients with OCD and depression disorder were 9.6 and 6.2 years, respectively. Currently, there is no available study showing whether ages of patients with MS and disease duration are related or not. Hence, necessity of conducting more studies according to age and disease duration seems to be critical. Another finding of this research is 'MMPI' scales differences between males and females with MS. This study addresses that dramatic and somatization scales are higher in females and anti-social, alcohol dependence and aggressive – abusive scales are more observed in males and such a difference is significant in both genders. In this regard, no study has been conducted to approve accuracy of this finding.

One of the restrictions of present research is that to reduce selection bias, samples are selected from 3 private and academic centers, and on the other hand almost 90% of the subjects are residents of Tehran, so its generalization to whole of Iranian society requires more extensive and wider researches. Also, due to eliminate the interference effect of other chronic diseases, above 60 years old patients are deleted which itself can be a limitation in this study. What is clinically considered very useful in this study can be significant difference of obtained scores in somatization disorder scale. This finding could be important for clinical specialists to diagnose and treat such patients, because these patients, in spite of having organic problems, can demonstrate considerably their psychological stresses in the form of physical and neurological symptoms. Therefore, training different psychological aspects to patients, their relatives and specialists is recommended so that they will not have a merely neurologic approach against this disease

## **Suggestions**

Ultimately, given the extent associated with MS, necessity of more studies in this field is clearly critical, particularly according to differences in gender, age of patients, disease duration and age of onset can be an important stage in order to improve Quality Of Life in patients with MS. Since patients with MS form a substantial part of patients referring to treatment centers and clinical demonstrations of this disease are often associated with stress and psychological aspects, more knowledge and information about psychiatric disorders of these patients (i.e. behavioral and personality aspects in particular) can guide us towards better and more correct solutions and planning in order to prevent and treat the disease. Finally these are some solutions to help patients better dealing with disease and thereby better acceptance of current treatments: Learning life skills, to boost self-confidence, anger management, training and attracting the support of family, friends and the others in same ages with the patients to have appropriate behavior with the patients with MS, helping them to better matching with the environment which is possible by cooperation of physicians, clinical psychologists, psychoanalysts, psychotherapists and social worker.

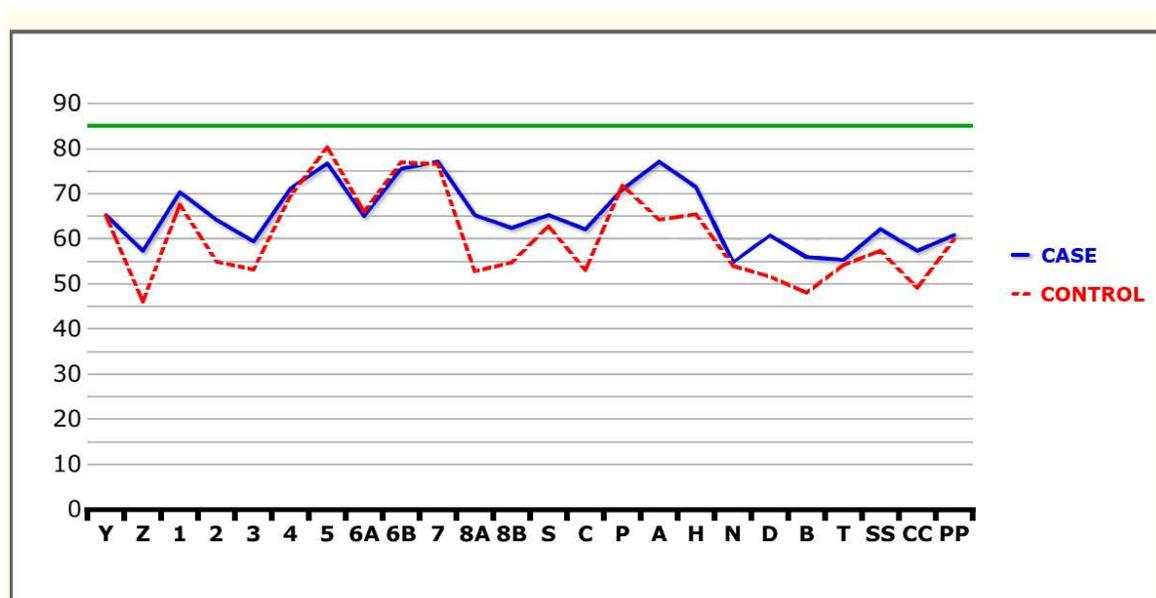
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## References

1. Kaplan Harold. L, Sadock Benjamin J. *Comprehensive Textbook of Psychiatry*", 18<sup>th</sup> Edition. Lippincott, Williams and Wilkins, 2005.
2. Kaplan Harold. L, Sadok Benjamin J. *Synopsis of Psychiatry*. 10<sup>th</sup> Edition, Lippincott, Williams and Wilkins, 2007.
3. Fauci A, Braunwald E, Kasper D, Hauser S, Longo D, Jameson J, Loscalzo J. *Harrison's Principles of Internal Medicine*. 17<sup>th</sup> Edition. Mc-Graw Hill, 2008.
4. Hauser SL, Oksenberg JR. The neurology of multiple sclerosis: genes, Inflammation, and neurodegeneration. *Neuron*. 2006; 5;52(1):61-76.
5. Mirzay Qomy M. *A Min of Clinical Neurology*. 5<sup>th</sup> Edition. Mir, 2003.
6. Aleyasin H, Sarai A, Alaedini F, Ansarian E, Lotfi J. Multiple sclerosis: A study of 318 Case. *Archives of Iranian Medicine*. 2002; 1(5), 24-27.
7. Spltanzade A. *Disease of Nerve and Brain*, 4<sup>th</sup> Edition. Jafary. 2004.
8. Chwastiak LA, Gibbons LE, Ehde DM, Sullivan M, Bowen JD, Bombardier CH, Kraft GH. Fatigue and psychiatric illness in a large Community sample of persons with multiple sclerosis. *J Psychosom Res*. 2005; 59(5):291-8.
9. Cree BA, Lamb S, Morgan K, Chen A, Waubant E, Genain C. An open label study of the effect of rituximab in neuromyelitis Optic. *Neurology*. 2005;64(7):1270-2.
10. Yousefi Pour GHA, Rasekhi AR. Multiple sclerosis: A risk factor analysis in Iran. *Archives of Iranian Medicine*. 2002; 3(5); 191-193.
11. Benedict RH, Wahlig E, Bakshi R, Fishman I, Munschauer F, Zivadinov R, Weinstock-Guttman B. Predicting quality of life in Multiple sclerosis: accounting for physical disability, fatigue, cognition, mood Disorder, personality, and behavior change. *Journal of the Neurological Sciences*. 2005; 231(1-2):29-34.
12. Aminoff MJ, Greenberg DA, Simon RP. *Clinical Neurology*. Sixth Edition, Mc Graw Hill, 2005.
13. Moos RH, Solomon GF. Personality correlates of the degree of Functional incapacity of patients with physical disease. *Journal of Chronic Diseases*. 1965; 18(10): 1019-1038.
14. Kanner AM. Should neurologists be trained to recognize and treat comorbid depression of neurologic disorder? Yes. *Epilepsy Behavior*, 2005; 6(3): 303-301.
15. Turner AP, Williams RM, Bowen JD, Kivlahan DR, Haselkorn JK. Suicidal Ideation in Multiple sclerosis. *Arch Phys Med Rehabil*. 2006; 87(8): 1073-8.
16. Benedict RH, Priore RL, Miller C, Munschauer F, Jacobs L. Personality disorder in multiple sclerosis Correlates with cognitive impairment. *J Neuropsychiatry Clin Neurosci*. 200;13(1):70-6.

17. Nelson LD, Elder JT, Tehrani P, Groot J. Measuring personality and emotional functioning in multiple sclerosis: a cautionary note. *Arch Clin Neuropsychol.* 2003;18(4):419-29.
18. Christodoulou C, Deluca J, Johnson SK, Lange G, Gaudino EA, Natelson BH. Examination of cloninger's basic Dimensions of personality in fatiguing illness Chronic fatigue syndrome and Multiple sclerosis. *J Psychosom Res.* 1999; 47(6): 597-607.
19. Reich E. Arias. Premorbid personality profile in multiple scelrosis patients. *Journal of the Neurological Sciences.* 2005; 238(1): 244.
20. Korostil M, Feinstein A. Anxiety disorders and their clinical correlates in multiple sclerosis patients. *J Mult Scler.* 2007; 13:67-72.
21. Harel-Barak Y, Achiron A. Dysregulation of affect in multiple sclerosis. *J Psychiatr Clin Neuroscience.* 2007;61: 94-98.
22. Shabani A, Moghadam JA. Panaghi L, Seddigh A. Anxiety disorders in multiple Sclerosis: significant obsessive-compulsive disorder comorbidity. *Journal of Research in Medicine Sciences.* 2007; 12(4): 172-177.
23. Kristensen H, Torgerson S. MCMI-II Personality Traits and Symptom Traits in parents of children with Selective Mutism: A case-Control Study. *J Abnorm Psychol.* 2001; 110(4):648-52.
24. Khajemogahy N. Preparing of persioan form MCMI-II inventory, dissertation Ms, Iran University of Medical Sciences, Tehran, 1993.



**Figure 1:** Personality profile in MS and control groups

**Table 1:** Personality patterns in MS and control groups

Personality patterns	MS group		Control group		P value
	Mean	Standard deviation	Mean	Standard deviation	
Schizoid	70.30	18.84	67.60	14.44	>0.05
avoidant	64.15	20.33	64.15	20.33	<0.03
Dependent	59.40	27.91	53.15	30.35	>0.05
histrionic	71.10	14.89	69.05	19.67	>0.05
Narcissist	76.72	16.73	80.30	18.42	>0.05
Antisocial	65.02	21.50	65.95	16.05	>0.05
Abusive-aggressive	75.50	19.33	76.95	13.22	>0.05
Forced	77.12	17.27	76.57	20.45	>0.05
Passive-aggressive	65.23	24.47	52.77	29.94	<0.01
Masochism	62.38	21.04	54.72	24.81	>0.05
Schizotypal	65.25	13.74	62.78	14.35	>0.05
Borderline	62.07	15.05	53.40	18.34	<0.02
Paranoid	70.90	13.47	71.82	14.76	>0.05

**Table 2:** Clinical syndrome in MS and control groups

Clinical syndrome	MS group		Control group		P value
	Mean	Standard deviation	mean	Standard deviation	
Anxiety	77.08	23.67	64.23	29.29	<0.009
somatization	71.42	14.72	65.43	16.78	<0.04
Mania	54.82	11.60	54.02	13.33	>0.05
dysthymia	60.67	25.86	51.57	27.55	>0.05
Alcohol abuse	55.95	11.68	48.05	18.30	<0.01
Drug abuse	55.27	15.82	55.27	15.82	>0.05
Thought disorder	62.15	11.23	57.35	15.94	<0.002
Major depression	57.32	17.23	49.10	19.89	<0.005
Delusion disorder	60.82	14.65	59.85	14.98	>0.05