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Original Research Article

# Prevalence and Presentation of Autoimmune Conditions of Central Nervous System in Bankura, A District Town in West Bengal, India - Recent Scenario

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**Conflict of interest: Nil**

**Abstract:**

**Introduction:** The immune system's inability to distinguish between potentially hazardous antigens and healthy tissue is a defining feature of autoimmune diseases. The present study was conducted to assess the prevalence and presentation of autoimmune condition of Central Nervous System in Bankura City, West Bengal.

**Material & Methods:** The cross-sectional study was conducted for a period of one year among 100 patients who visited the department of neurology, Bankura Sammilani Medical College, West Bengal. The demographic characteristics of patients like age, gender, residence etc was noted. The statistical package for social science (SPSS), version 25.0, was used to analyze the data.

**Results:** Out of total 100 patients 41% fell in the age group of above 60 years. Female patients (64%) were higher in number as compared to males (36%). Prevalence of autoimmune conditions seen in patients was Rheumatoid arthritis (33%), Sjogren syndrome (20%), Systemic lupus erythematosus (11%), Polymyalgia rheumatic (8%). Association with age and gender shows significant results (p=0.001).

**Conclusion:** Autoimmune conditions had particular age of onset and prevalence of this disease among females is more as compared to males. Different regions of the country may have different prevalence rates of neurological illnesses due to demographic variety.

**Keywords:** Autoimmune Condition, Central Nervous System, Prevalence, Gender, age of onset.



## Introduction

Neurological diseases are common as well as significant disorders that cause varying degrees of disability and loss of productive life.[1] Our immune system has developed to be remarkably effective in defending against a wide range of pathogens.

Nonetheless, the overall estimated prevalence of autoimmune disease is 4.5%.[2] More than 80 autoimmune diseases, including roughly 30 nervous system autoimmune disorders, can be caused by abnormal immune responses directed against the self.[3] The immune system's inability to distinguish between potentially hazardous antigens and healthy tissue is a defining feature of autoimmune diseases. The idea of molecular mimicry helps to explain why the immune system attacks its host.

The process by which a foreign antigen shares structural similarities with self-antigens is called molecular mimicry. Self-destructive attacks brought on by molecular mimicry can emerge as a wide range of bodily reactions, from mild to fatal. The age at which different autoimmune disorders manifest varies as well.[4]

Sjogren's syndrome usually manifests in people between the ages of 40 and 60, but minor symptoms are frequently disregarded, delaying diagnosis. The age range for Systemic lupus erythematosus (SLE) onset is 15 to 55 years; those with SLE who are identified earlier in life typically have a more severe version of the disease. The typical age range for a Systemic Sclerosis diagnosis is 20 to 50 years old. Psoriasis is diagnosed between the ages of 15 and 35, whereas rheumatoid arthritis is diagnosed between the ages of 30 and 60. These represent a tiny portion of the countless autoimmune illnesses that afflict 20% of the world's population.[5]

The exact etiology of autoimmune disorders is said to be unknown; however, it has been postulated that it may be multifactorial. Despite the large number of prevalence studies on neurological illnesses, there are intrinsic flaws in the case definition and assessment methodology, the research population's correct sampling, and the failure to adjust rates for age using standard national and international population.[6-8] These could be the main causes of India's significant variances in the prevalence rates of several neurological illnesses.

Hence the present study was conducted to assess the prevalence and presentation of autoimmune condition of Central Nervous System in Bankura City, West Bengal.

**Aims and Objectives**

1. To determine the prevalence of various neurological disorders of central nervous system in a district town in West Bengal.
2. To determine the association of different autoimmune condition with age group.

**Material and Methods**

The present cross-sectional study was conducted for a period of one year among patients who visited to department of neurology to find out the prevalence and presentation of autoimmune condition of central nervous system. Ethical permission was taken from institutional ethical committee before the commencement of study. Patients were asked to sign informed consent form after explaining them the procedure of research.

Through random sampling a sample size of 100 patients was determined and patients were selected on the basis of following inclusion and exclusion criteria:

**Inclusion Criteria**

1. Patients above age of 18 years.
2. Patients diagnosed with autoimmune condition of CNS.
3. Patient who were permanent resident of West Bengal attending BSMCH Neurology only.

**Exclusion Criteria**

1. Patients below the age of 18 years.
2. Patients suffering from any other medical illness.
3. Patients who refused to sign informed consent form.

Patients were thoroughly examined at the department. Their laboratory data were also studied according to the clinical condition. The demographic characteristics of the patients like age, gender, residence etc were noted.

The statistical package for social science (SPSS), version 25.0, was used to analyze the data. The nominal data were reported as frequency and percentage, whereas the continuous data were expressed as Mean ± SD. P values < 0.05 were deemed significant in all tests.

**Results and Analysis of Data**

Out of total 100 patients 41% fall in the age group of above 60 years, 25% were of 51-60 years of age, 17% were between 41 to 50 years, 11% were of 31 to 40 years and 7% were under the age group of 18 to 30 years. Female patients (64%) were higher in number as compared to males (36%) as shown in table 1.

**Table 1: Shows demographic characteristics of patients**

| Variable | | Percentage |
|---|---|---|
| Age (in years) | 18-30 | 7 |
| | 31-40 | 11 |
| | 41-50 | 17 |
| | 51-60 | 25 |
| | 60 years above | 41 |
| Gender | Male | 36 |
| | Female | 64 |

Prevalence of autoimmune conditions seen in patients were Rheumatoid arthritis (33%), Sjogren`s syndrome (20%), Systemic lupus erythematosus (11%), Polymyalgia rheumatica (8%), Giant cell arteritis (7%), Polyarteritis nodosa (5%), Grave`s disease (3%), Hashimoto thyroiditis (3%), Psoriasis (2%), Pernicious anemia (2%), Ulcerative colitis (2%), Autoimmune gravis (2%), Myasthenia gravis (1%) and Uveitis (1%) as shown in table 2.

**Table 2: Showing prevalence of autoimmune conditions**

| Autoimmune condition | Frequency |
|---|---|
| Rheumatoid arthritis (RA) | 33 |
| Sjogren syndrome (SS) | 20 |
| Systemic lupus erythematosus (SLE) | 11 |
| Polymyalgia rheumatica (PR) | 8 |
| Giant cell arteritis (GCA) | 7 |
| Polyarteritis nodosa (PN) | 5 |
| Graves disease (GD) | 3 |
| Hashimoto thyroiditis (HT) | 3 |
| Psoriasis (P) | 2 |
| Pernicious anemia (PA) | 2 |
| Ulcerative colitis (UC) | 2 |
| Autoimmune gravis (AG) | 2 |
| Myasthenia gravis (MG) | 1 |
| Uveitis (U) | 1 |

Association of autoimmune conditions with age groups was calculated and it was found that onset of Sjogren's syndrome is seen around the ages of 40-60; onset of SLE can be seen between the ages of 15 and 55 years; Systemic sclerosis is usually diagnosed between 20 and 50 years of age. Rheumatoid arthritis is diagnosed between the ages of 30 and 60 years, while psoriasis is diagnosed between 15 and 35 years of age and results were statistically significant (p =0.001) as shown in table 3.

**Table 3: Association of autoimmune conditions with age groups**

| Age groups | Autoimmune conditions | | | | | | | | | | | | | | P value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | SS | SLE | PR | GCA | PN | GD | HT | P | PA | UC | AG | MG | U | 0.001 |
| 18-30 | 0 | 0 | 4 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 31-40 | 1 | 0 | 3 | 2 | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 41-50 | 3 | 4 | 2 | 2 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | |
| 51-60 | 6 | 6 | 2 | 3 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | |
| >60 | 23 | 10 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | |

Association of autoimmune conditions with gender was calculated and it was found that the prevalence of diseases were more common in females as compared to males and results were statistically significant (p=0.001) as shown in table 4.

**Table 4: Association of autoimmune conditions with gender**

| Gender | Autoimmune conditions | | | | | | | | | | | | | | P value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RA | SS | SLE | PR | GCA | PN | GD | HT | P | PA | UC | AG | MG | U | 0.001 |
| Male | 10 | 7 | 5 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | |
| Female | 23 | 13 | 6 | 5 | 5 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | |

## Discussion

The term "autoimmune disorders" refers to a situation when the immune system of the host unintentionally targets itself. These illnesses trigger the immune system to attack several organs, or it may be restricted to attacking a single organ, such the skin. Although the precise mechanism underlying these autoimmune disorders is unknown, it is generally accepted that there is variations in the etiology.[9]

The present study was conducted among 100 patients who visited the department of neurology during the study period to assess the prevalence and presentation of autoimmune condition of Central Nervous System in Bankura city, district headquarter of a district in West Bengal, India. The study was conducted at an institute which is centrally located in the city. In order to exclude the migrant population, the chosen resident were those who were permanent citizen of the city.[10] In our study maximum number of patients (41%) was in age group of 60 years above and females (64%) were more as compared to males (36%). This shows the prevalence of autoimmune conditions more in older age groups and in female category. Many autoimmune disorders tend to affect women during periods of extensive stress, such as pregnancy, or during a great hormonal change. The age at which a disease first manifests itself varies greatly. For instance, symptoms of systemic lupus erythematosus (SLE) often appear between the ages of 16 and 55 in 65 percent of patients.[11] Fifteen percent more people show them after the age of fifty-five, and twenty more before the age of sixteen.[12]

Although it can start at any age, rheumatoid arthritis (RA) peaks between the ages of 30 and 55.[13] The inflammatory, autoimmune joint

disease that strikes children is known as juvenile idiopathic arthritis (JIA). Sjögren's syndrome (SS), another common AD, is thought to affect women more frequently between the ages of 45 and 50. [14]

Rarely does multiple sclerosis (MS) manifest throughout adolescence; instead, it typically manifests between the ages of 20 and 40.[15] With two peaks of onset, one between the ages of 5 and 9 and the other between the ages of 10 and 14, type 1 diabetes mellitus (T1D) is thought to be a disease that affects children and adolescents.[16] Conversely, an adult onset is thought to occur between the ages of 25 and 61.[7] Lastly, it is believed that autoimmune thyroiditis (AITD) is a condition that can manifest in childhood but is more common in maturity.[18]

From the previous studies it was reviewed that over 100 different kinds of autoimmune illnesses primarily impact women. Women make up about 80% of all patients with autoimmune disease diagnoses.[4] Women are impacted by Sjogren's syndrome, an autoimmune disease that affects them 9:1 in comparison to men and is characterized by chronic dry eyes and mouth from lachrymal and salivary gland degeneration.[5]

Women are seen to be affected by SLE, an autoimmune illness where the body targets healthy tissues, affecting the brain, kidneys, joints, and skin in a 7:1 ratio.[19] They are disproportionately affected by rheumatoid arthritis, a chronic inflammatory autoimmune disease of the joints that can paralyze fingers, wrists, feet, and ankles.[9] Women are more likely than men to be affected by systemic sclerosis, an autoimmune illness that affects the skin and internal organs of patients because of a collagen deficiency.[20] The analysis indicates that over the course of a lifetime, women are more likely than males to develop autoimmune disorders. Researchers have also hypothesized a connection between X inactivation and autoimmune disorders.

## Conclusion

From the present study it was concluded that autoimmune conditions had particular age of onset. The prevalence of these diseases among females is more as compared to males. Different regions of the country may have different prevalence rates of neurological illnesses due to demographic variety. Consequently, more epidemiological research utilizing a standard methodology, case definition, and suitable representative sampling of the study population must be carried out in India to investigate the evolving pattern of autoimmune conditions related to central nervous system. In addition to determine the prevalence of the disease, it is important to ascertain its incidence and risk factors in order to outline the natural progression of neurological diseases, and the resulting disabilities. This may help us to chalk out the prevention management strategies before it progressed to an irreversible stage.

## Limitations

**Small sample size:** A larger sample size would have been better for representation.

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