The Bioscan AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES 19(2): S.I (1), 873-876, 2024 www.thebioscan.com

AN AMBISPECTIVE STUDY ON ATAXIA PATIENTS ADMITTED IN NEUROLOGY DEPARTMENT OF A TERTIARY CARE HOSPITAL

Sk. Jaheda Begum[1], G. Bindu Narmada[2], G. Venkata Vagdevi[3], K. Pardha Saradhi[4], C. Pavan Sai[5], B. Pravallika[6]

1. Assistant Professor, Department of Pharmacy Practice, Chalapathi Institute of Pharmaceutical sciences, Lam, Guntur.
2. Assistant Professor, Department of Neurology, Guntur Medical College, Guntur.
3. V/VI Pharm D, Department of Pharmacy Practice, Chalapathi Institute of Pharmaceutical sciences, Lam, Guntur.
4. V/VI Pharm D, Department of Pharmacy Practice, Chalapathi Institute of Pharmaceutical sciences, Lam, Guntur.
5. V/VI Pharm D, Department of Pharmacy Practice, Chalapathi Institute of Pharmaceutical sciences, Lam, Guntur.
6. V/VI Pharm D, Department of Pharmacy Practice, Chalapathi Institute of Pharmaceutical sciences, Lam, Guntur.

Corresponding author: Dr. Shaik Jaheda Begum

DOI: https://doi.org/10.63001/tbs.2024.v19.i02.S.I(1).pp873-876

KEYWORDS
Spinocerebellar Ataxia, Unsteady gait, Neurological disorders, Ataxia Risk Factors

Received on:
13-11-2024

Accepted on:
06-12-2024

Published on:
02-01-2025

ABSTRACT

BACKGROUND: Ataxia refers to impaired motor control, often described as incoordination, which hampers the ability to perform smooth, controlled movements. This condition can impact various functions, including speech, swallowing, walking, balance, hand-eye coordination, and eye movements. The primary objective of this study is to assess the relationship between different types of ataxias and their underlying causes, risk factors, associated conditions, and distinguishing characteristics.

METHODOLOGY: Over six months, an ambispective observational study conducted at a tertiary care hospital identified ataxia in 48 out of 850 patients. Data were collected from both inpatient and outpatient neurology departments. Statistical methods, including the chi-square test, were applied to analyze and tabulate the data, leading to the study's findings.

RESULTS: Our study revealed that ataxia was more prevalent among males, primarily in the age group of 31–45 years. The majority of subjects (91.6%) exhibited unsteady gait. Notably, a significant proportion (68.75%) were born to parents in consanguineous marriages, indicating a potential correlation. Additionally, clinical parameters such as alcohol consumption, tobacco smoking, hypertension, and a family history of ataxia demonstrated significant interdependence.

CONCLUSION: The study identified middle-aged males as the most commonly affected group, presenting with symptoms such as unsteady gait, poor coordination, imbalance, and slurred speech. Many of these individuals had comorbidities, including hypertension (HTN) and cerebrovascular accidents (CVA). While some clinical parameters showed correlations with the observed symptoms, no significant association was established between age, gender, etiology, and comorbidities. The study concluded that certain key clinical parameters might have meaningful associations warranting further investigation.

INTRODUCTION

Ataxia is a neurological disorder marked by neural degeneration. It is a significant condition often seen in individuals with multiple sclerosis, cerebellar degeneration, or stroke. Ataxia commonly leads to issues such as gait instability and postural disturbances.[1] Many symptoms of ataxia resemble those of intoxication, including slurred speech, stumbling, falling, and incoordination. These issues arise from damage to the cerebellum, the brain region responsible for motor coordination. Alongside medication, therapy plays a crucial role in alleviating symptoms and improving the quality of life for individuals with ataxia.[2] Cerebellar disorders are prevalent worldwide in both children and adults, with their epidemiology influenced by various factors such as patient evaluation methods, clinical assessments, and geographic location.[3] Friedreich ataxia, a rare disorder, affects approximately one in every 22,000 to 50,000 individuals worldwide. Recent global research on ataxia estimates the prevalence of dominant hereditary cerebellar ataxia (CA) at 2.7 per 100,000 in children, recessive hereditary cerebellar ataxia at 3.3 per 100,000, and cerebellar ataxias at 26 per 100,000 in children. Cerebellar ataxias are neurodegenerative disorders impacting the cerebellum and are inherited through both autosomal dominant and recessive patterns. They constitute 30-40% of all ataxia cases globally. Notably, consanguineous marriages were reported in 51.5% of individuals with autosomal dominant cerebellar ataxia.[4,5,7]

Magnetic resonance imaging (MRI) identified isolated cerebellar atrophy, while genetic testing confirmed a mutation in the CACNL1A4 gene. A study from eastern India found that

spinocerebellar ataxia (SCA) was the leading cause of cerebellar ataxia, with SCA2 being the most prevalent, followed by SCA3, SCA1, SCA6, and SCA12. Advances in molecular genetics and MRI brain imaging have significantly improved the ability of clinicians to diagnose hereditary causes of ataxia. However, despite these advancements in understanding the genetic basis of the disease, pharmacological treatment options for cerebellar ataxia remain limited. Effective management lies in developing disease-modifying therapies that target specific underlying mechanisms.[8,9,10,11,12]

METHODOLOGY:

Sample Selection, Design, and Procedure:

This study was conducted at a tertiary care hospital, where 48 out of 850 cases were diagnosed with ataxia and included for analysis. Data were analyzed and tabulated using statistical tools.

Inclusion Criteria:

- Patients aged between 6 and 70 years
- Both male and female patients diagnosed with ataxia
- Individuals willing to participate in the study

Exclusion Criteria:

- Individuals unwilling to participate
- Patients unable to provide informed consent
- Patients with psychological disabilities

Patients were screened based on the inclusion and exclusion criteria, with a focus on the clinical characteristics of ataxia. Data were gathered using a validated questionnaire, and the analysis involved a chi-square test to assess significant associations. A significance level of $P<0.05$ was set, with a 95% confidence interval.

RESULTS:

A total of 48 subjects were included in the study based on the inclusion criteria. The largest group of participants (n=16, 33%) was aged between 31 and 45 years. Males were more prevalent than females, with 30 males (62.5%). Most participants were underweight (P=0.000096). The majority reported an unstable gait (n=44, 91.6%) and difficulty with coordination (n=30, 62.5%). Consanguineous marriages were common among the participants (P=0.009375). Significant correlations were observed between ataxia and several clinical factors, including blood pressure (P=0.002329), alcohol consumption (P=0.009375), and tobacco use (P=0.000667).

Chief Complaints:

The majority of subjects reported experiencing an unsteady gait (n=44, 91.6%), followed by difficulty with coordination (n=30, 62.5%), slurred speech (n=20, 41.66%), imbalance (n=18, 37.5%), tremors (n=10, 20.83%), and seizures (n=1, 2.08%). These findings are illustrated in Figure 1.

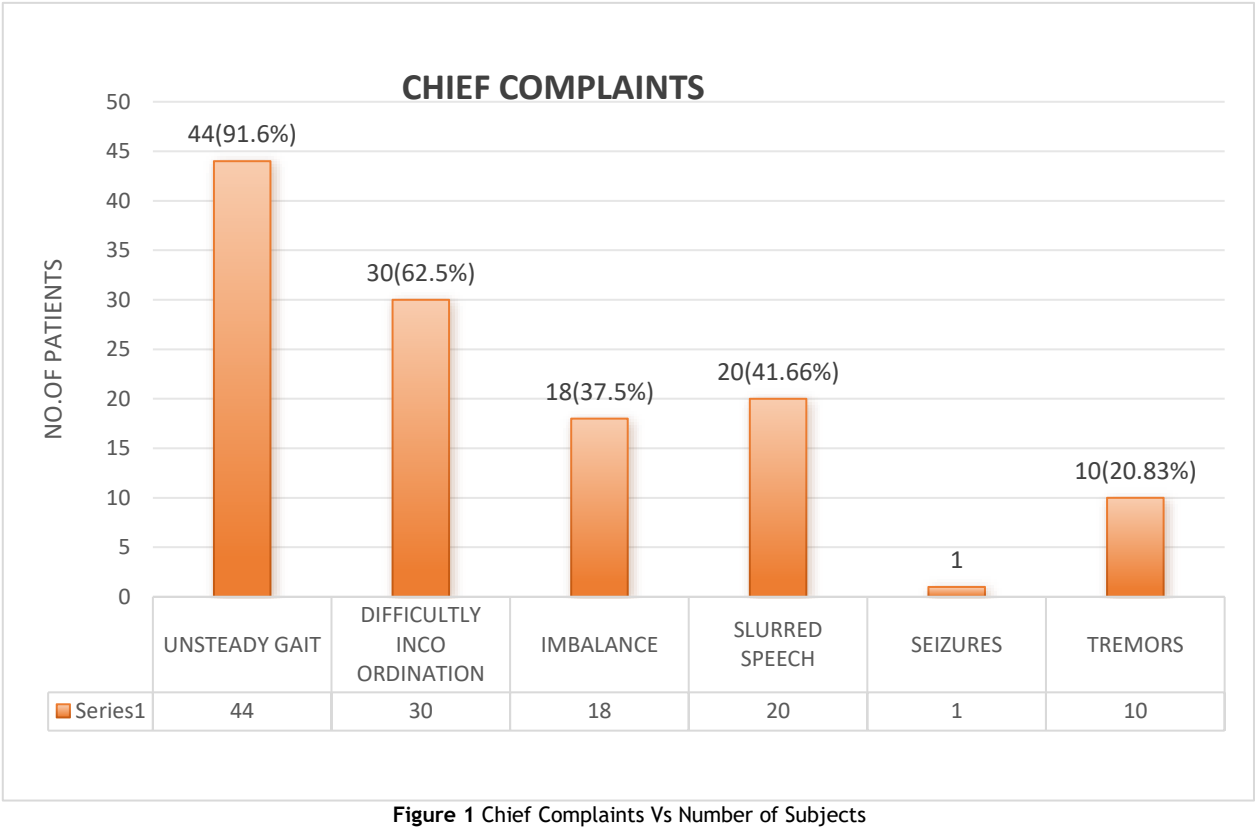

Figure 1 Chief Complaints Vs Number of Subjects

ETIOLOGY:

Among the 48 subjects, the majority (44%) had an idiopathic cause for ataxia. Other contributing factors included hereditary causes (31%), accidents (11%), multiple sclerosis (6%), and infections and stroke (4%), as shown in Figure 2.

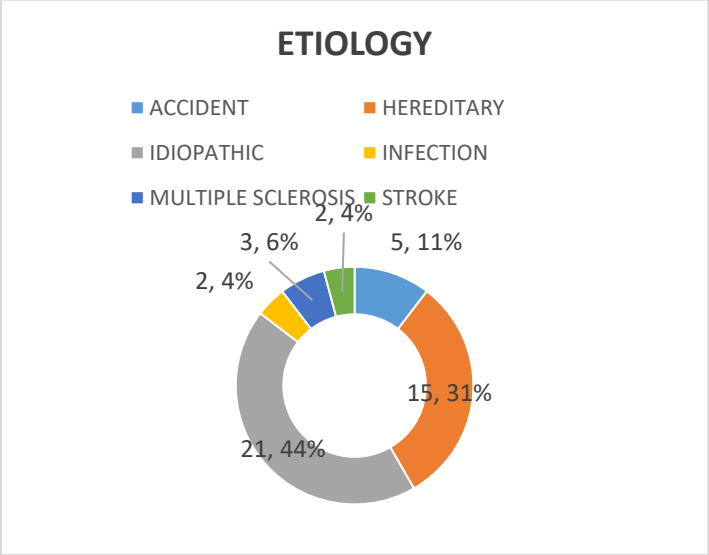

Figure 2 Etiological Factors of Ataxia in the Subject Sample

COMORBIDITIES:

In our study, the majority of subjects did not have any comorbid conditions. Among those with comorbidities, hypertension (HTN) and type 2 diabetes mellitus (DM) were the most common, affecting 16% of participants, followed by hypertension alone in 12%. These findings are depicted in Figure 3.

Figure 3 Associated Comorbidities

TYPES OF ATAXIA:

From our study, hereditary ataxia (70.83%) was predominant than acquired ataxia (14.5%) followed by spastic ataxia (12.5%) and least sensory ataxia (2.08%) which is shown in Figure 4.

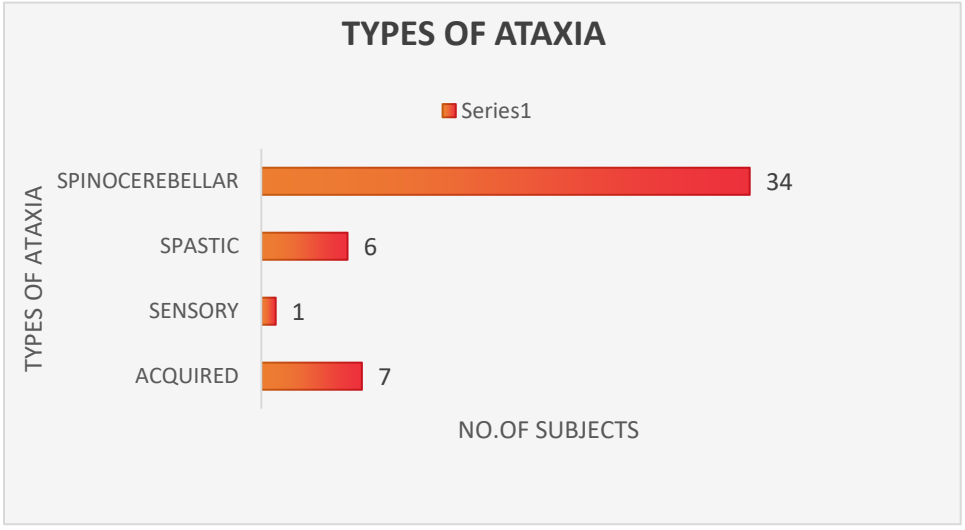

Figure 4 Types of Ataxia Found in Study Subjects

ALCOHOL AND TOBACCO USE:

In our study, the distribution of subjects based on alcohol consumption showed that 30 participants (62%) consumed alcohol, while 18 (38%) did not. This is graphically represented in Figure 5. Regarding smoking habits, the majority of subjects were

non-smokers (28, 58.3%), followed by past smokers (13, 27.08%) and current smokers (7, 14.5%), as shown in Figure 6.

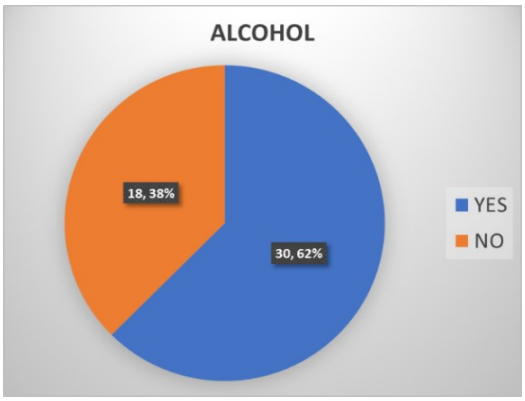

Figure. 5 Alcohol Use In Subjects

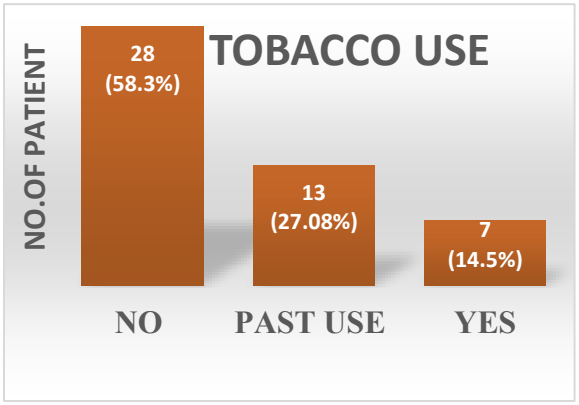

Figure 6 Tobacco Use In Subjects

DISCUSSION

This study was conducted at a tertiary care hospital in Guntur, India, to explore the etiology, risk factors, and prevalence of acquired and inherited ataxias. Out of 850 cases, 48 individuals were diagnosed with ataxia, with a higher prevalence in males (62%) compared to females (38%). The majority of subjects were underweight (62.5%), and the most common presenting symptom was unsteady gait (91.6%). Idiopathic ataxia accounted for 44% of cases, while hereditary forms made up 31%. A significant association was found between family history and the occurrence of ataxia. Among the 48 subjects, 62% reported alcohol consumption, while most were non-smokers (58.3%). Although most participants had no significant medical history, 50% were hypertensive. MRI results revealed mild cerebellar atrophy in 58.3% of cases. Spinocerebellar ataxia (SCA) was the most prevalent type, affecting 70.83% of the cohort, followed by acquired ataxia (14.58%), spastic ataxia (12.5%), and sensory ataxia (2.08%). Spinocerebellar ataxia was identified as the dominant form of ataxia in this study.

CONCLUSION

The study revealed that middle-aged males were more frequently affected by ataxia, presenting symptoms such as unsteady gait, poor coordination, imbalance, slurred speech, and tremors. Many subjects had comorbidities, including diabetes, hypertension, and cerebrovascular accidents. Significant associations were found between risk factors such as family history, alcohol consumption, tobacco use, blood pressure, and BMI. However, no significant correlation was observed between age, gender, etiology, and comorbidities. The study concludes that a meaningful relationship exists between the key factors identified in the analysis.

ETHICAL CONSIDERATIONS

Since this was an observational study without interventions, formal ethical approval was not required. However, informed consent was obtained from all participants to ensure adherence to ethical standards. Participants were fully informed about the purpose of the study, and their confidentiality was strictly maintained. Personal information collected through questionnaires remained private and was used solely for the research purposes outlined in the study approval. Consent forms were signed by all subjects to maintain the confidentiality of their information, which will not be used beyond the scope of this research.

LIST OF ABBREVIATIONS

HTN – Hypertension
DM – Diabetes Mellitus
CVA – Cerebrovascular Accident
CA – Cerebellar Ataxia
SCA – Spinocerebellar Ataxia
MRI – Magnetic Resonance Imaging
MS – Multiple Sclerosis

Acknowledgment:

We would like to sincerely thank Chalapathi Institute of Pharmaceutical Sciences and Government General Hospital Guntur for providing the necessary materials for this study. We also express our gratitude to all the participants who took part in the research.

REFERENCES

- Matsugi A. Physical therapy for cerebellar ataxia. Neurological Physical Therapy. 2017 May 10;157.
- Nace M, Lopez M. Friedreich ataxia epidemiology [Internet]. Rare Disease Advisor. 2023 [cited 2024 Feb 16]. Available from: https://www.rarediseaseadvisor.com/disease-info-pages/friedreich-ataxia-epidemiology/
- Salman MS. Epidemiology of cerebellar diseases and therapeutic approaches. The Cerebellum. 2018 Feb;17(1):4-11.
- Mukherjee A, Bhuin S, Biswas S, Roy A, Pandit A, Gangopadhyay G. Etiology and course of cerebellar ataxia: A study from Eastern India. Med J Dr DY Patil Vidyapeeth [Internet]. 2023 [cited 2024 Feb 16];16(4):591. Available from: https://journals.lww.com/mjdy/fulltext/2023/16040/etiology_and_course_of_cerebellar_ataxia__a_study.21.aspx
- Salman MS. Epidemiology of cerebellar diseases and therapeutic approaches. The Cerebellum. 2018 Feb;17(1):4-11.
- Williams CT, De Jesus O. Friedreich Ataxia. [Updated 2023 Aug 23]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK563199/
- Researchgate.net. [cited 2024 Mar 17]. Available from: https://www.researchgate.net/publication/358332496_Etiology_and_course_of_cerebellar_ataxia_A_study_from_eastern_India
- Bhattacharyya KB, Pulai D, Guin DS, Ganguly G, Joardar A, Roy S, Rai S, Biswas A, Pandit A, Roy A, Senapati AK. Spinocerebellar ataxia type 6 in eastern India: Some new observations. Ann Indian Acad Neurol. 2016 Jul-Sep;19(3):360-6. doi: 10.4103/0972-2327.186823. PMID: 27570389; PMCID: PMC4980960.
- Bhuin S, Biswas S, Roy A, Mukherjee A, Pandit A, Gangopadhyay G. Etiology and course of cerebellar ataxia: A study from Eastern India. Med J Dr DY Patil Vidyapeeth. 2023 Jul-Aug;16(4):591-598. doi: 10.4103/mjdrdypu.mjdrdypu_314_21.
- de Silva RN, Vallortigara J, Greenfield J, et al. Diagnosis and management of progressive ataxia in adults. Pract Neurol. 2019;19:196-207.
- Ogawa M. Pharmacological treatments of cerebellar ataxia. The Cerebellum. 2004 Jun;3:107-11.
- Perlman SL. Update on the treatment of ataxia: medication and emerging therapies. Neurotherapeutics. 2020 Oct;17(4):1660-4.