

Classification of Symptoms that Occurs in Neurological Disorders by using Data Mining Techniques

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Abstract:-Data mining has more effective techniques in eliminating insignificant data. Nowadays, People are not spending their efficient time identifying their condition until it progresses. Parkinsonism comprises some cluster of characteristic conditions such as Weak movement, Tremor, and Muscle stiffness. As yet there is no cure for all types of Parkinsonism, but there are many therapies to follow to improve their life expectancy. Progressive Supranuclear Palsy (PSP) is a few well-known disease among people that mostly affects the brain. The disease outcome is damaging nerve cells in the brain. Due to the analogy of some symptoms during the primordial stage of the disorders and it is intermittently predicted as Parkinson's disease. PSP causes more relentless symptoms, not respond effectively to Parkinson's medicine, and the span of life will be less. It is a testing assignment to diagnose if a human is influenced by PSP to examine with symptoms such as Tremor, Posture. Data mining techniques are most useful in identifying neurological disorders through symptoms. This paper contemplates different data mining techniques in diagnosing Parkinson's and Parkinson's plus syndrome in the early stage to enhance the quality of living.

Keywords: *Progressive Supranuclear Palsy, Parkinson's disease, Data Mining, and Classification.*

INTRODUCTION

Data mining helps in the medical field to identify the symptoms that occur in the primordial stage to reduce the cost and to improve the health condition of patients affected with a neurological disorder. Most of the experts involved in enhancing medical technology to decrease the amount for complete health care using some data mining techniques. Neurological disorder such as Parkinson's and PSP have similar symptoms, it is misdiagnosed and proper treatment has not provided for the patient to increase their span of life. Data Mining classification techniques used to eradicate the incorrect diagnosis happened through symptoms. The objective of this paper is to show the similarities of each type of neurological disorder and in future different data mining, classification techniques are applied such as Decision Tree Induction, Bayesian Classification, Support Vector Machine, Rule-Based Classification to find out the accuracy of each symptom.

II. RELATED WORK

Carlo Ricciardi et.al[1] utilized the gait analysis parameters to classify Parkinson and Atypical Parkinson disease and used Random Forests algorithm and Gradient Boosted Trees Algorithm. The classification accuracy achieved in this paper was 86.4%.

Shook Ja Lee et.al[2] explained about the quality of life with people who affected by Parkinson disease by using various variable factors such as Depression, pain, Sleep disturbances, Fatigue and done hypothesis tests.

Gokul.s et.al[3] predicted the Parkinson disease using Fully Complex-valued Radial Basis Function network(FC-RBF), MetaCognitive Fully Complex-Valued Radial Basis Function Network(Mc-FCRBF) and Extreme Learning Machine with the help of Unified Parkinson's Disease Rating Scale(UPDRS) and Severity of the patient affected with Parkinson disease and for untreated patient and showed that Mc-FCRBF network has good prediction accuracy.

Patrick Schwab et.al[4] used new technologies for monitoring and diagnosing of Parkinson disease and assess symptom severity of Parkinson disease from the recorded signals in Smartphone-based test in walking, checking voice, tapping and memory testing .

Tarigoppula V.S.Sriram et.al[5] utilized the voice dataset for the Parkinson disease, diagnosing through Machine learning approach and proved that voice data is used as a diagnostic method for human diseases.

Bradley F.Boeve [6] suggests the importance of identifying patients with this disorder.

Brent Bluett et.al [7] analyses, this study was to identify clinical parameters most significantly associated with increase falls in PSP.

III. PARKINSON'S, PSP AND ITS SYMPTOMS

The PSP is often compared with Parkinson's due to the resemblance of same symptoms mainly stiffness, weak movement and movement difficulties and it's the reason that PSP and Parkinson's cause parkinsonism. The PSP may be hard to discriminate from PD early on. However, Tremor is the most common symptom that affects 70 percent of people with Parkinson's and 10 percent of people with PSP. One main dissimilarity is that people with PSP find it difficult to look upwards or downwards,

whereas people with Parkinson's may feel other eye-related problems, including vision in double, blinking continuously or massive amount of watering from the eyes. It won't be clear in the primordial stages of the disorder. Another important symptom is posture. People with PSP tend to bend their heads towards the back, while people with Parkinson's usually bend their head towards the front. Problems with speech and swallowing tend to be more common and severe in PSP, if the patients have trouble in consuming the food than the patient span of years will be short. The sense of aroma will stay long in PSP, whereas it is often lost in Parkinson's.

The table 1 shows the symptoms of PSP with its stages.

Symptoms	Stages
Tremor	3
Eye related problems	1
Posture	4
Speech	2
Swallow	5

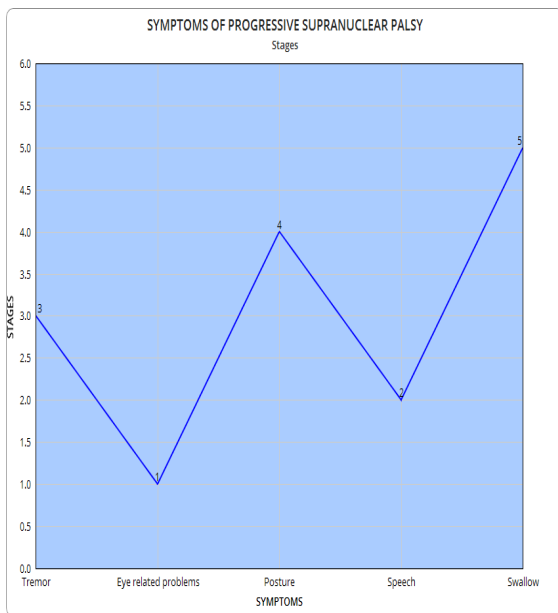


Figure. 1 shows the symptoms of Progressive Supranuclear Palsy and its stage.

The table 2 shows the data about Patient details with 5 attributes. The Dataset have been downloaded from kaggle.

Patient ID	Age	Age of disease Onset	Duration of disease from first symptoms (years)	Tremor	Posture
PD01	58	56	2	0	0
PD02	68	67	1	0	1
PD03	68	67	1	0	3
PD04	75	73	2	0	1
PD05	61	60	0.7	3	2
PD06	58	58	1	0	1
PD07	79	78	1	3	2
PD08	59	57	2	1	1
PD09	73	72	1	1	1
PD10	66	65	1	1	1

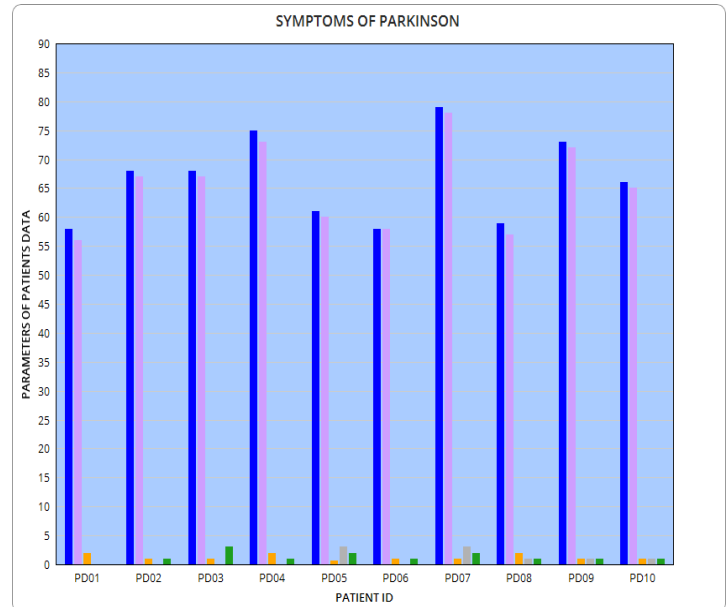


Figure. 2 shows the parameters of the Parkinson disease patient dataset in the X-Axis and value of age and its symptoms in the Y-Axis.

IV. CONCLUSION AND FUTURE WORK

The paper discussed about the different stages and types of symptoms to show the variation in the Neurological disorders. In the Future, we will implement the Data Mining classification techniques for the symptoms of neurological disorders to increase the patient span of life.

V. REFERENCES

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