Original Article

Prevalence and Natural History of X-Linked Dystonia Parkinsonism in Koronadal City, South Cotabato

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ABSTRACT: X-linked dystonia Parkinsonism (XDP) is an adult-onset, progressive, debilitating movement disorder, manifesting predominantly with dystonia in combination with Parkinsonism. It was first reported in 1975 among males in Panay Island. Migrants from Panay Island occupied the region of South Cotabato in Mindanao with its capital Koronadal City. The estimated population of the region is 912,957 as of 2015 and the dominant ethnicity, comprising 51%, are from Panay Island. This paper calls attention to this migration and aimed to identify cases and describe the clinical picture of XDP in Koronadal City. A descriptive study using the screening questionnaire for XDP was used per barangay to look for possible cases. Cases were confirmed through interview and assessment by a movement disorder specialist. Four cases of XDP from Koronadal City were seen. They were all male, presenting with generalized dystonia. The phenomenology of these cases is similar to the 2011 study involving 312 patients. Eleven patients from other municipalities of South Cotabato also came for evaluation and were assessed to have XDP as well. Expansion of this study to involve the entire region of South Cotabato is warranted to provide a more accurate picture of the prevalence and natural history of the disease in the region.
Keywords: *DYT3, Koronadal, "Lubag", Panay Island, X-linked dystonia-Parkinsonism, XDP*

INTRODUCTION

X -linked dystonia Parkinsonism (XDP) commonly known as "Lubag" is an adult-onset, progressive, debilitating movement disorder first reported among Filipino males in Panay Island, Philippines. It presents predominantly with severe, torsion dystonia later combined with or replaced by parkinsonian features. Initially, 93.4% present with focal dystonia while 5.7% present with parkinsonian traits.[1]

The phenomenon, first reported in 1975, described 28 adult males who presented with torsion dystonia with 23 of the subjects from Panay.[2] After 15 years, XDP was characterized as a combination of dystonia and parkinsonism.[3] Twenty-five years after XDP was first reported, more cases were identified and recorded in the registry.[4] As of February 2010, there are 505 cases with 312 survivors.[1] The prevalence rate for the entire Philippines at the time was 0.31 per 100,000 population. For the entire island of Panay, it is 5.74 per 100,000 population with the province of Capiz having the highest prevalence at 23.66 per 100,000, followed by Aklan at 7.72, Iloilo at 1.43, Antique at 0.86, and Guimaras at 0.73.

An XDP Study Group was formed in the 1980s to identify and track cases, and form partnerships with the local government, the Health Department, the Philippine Neurological Association, and academic medical centers. An infrastructure for identification and referral of suspected cases is seen in Capiz, and a system of referral has been developed.[1] Currently, most researches and projects on XDP have focused mainly on Panay Island.

The region of South Cotabato in Mindanao with its capital Koronadal City is populated mainly by migrants from Panay Island (Capiz, Iloilo, Guimaras, and Antique). The Western Visayan provinces of Negros Occidental, Aklan, Antique, Capiz, and Iloilo supplied large numbers of migrants to Mindanao, especially the frontier provinces. Approximately two-thirds of the 311,000 persons born in the western Visayas in 1960 resided in Cotabato. More than half of the persons living in Cotabato who reported birthplaces outside Mindanao were born in the Western Visayas.[5] This dominance of Western Visayan migrants in Cotabato is not solely a postwar phenomenon. This similar pattern of origin among the Koronadal settlers was also noted during the pre-war period. Manuel Quezon created the National Land Settlement Administration (NLSA) to encourage migration to sparsely populated regions in Mindanao. The Koronadal settlement project was among its first with settlers mostly coming from Iloilo, Capiz, Leyte and Cebu.[6]

Currently, the South Cotabato database from the Provincial Planning and Development office, records an estimated population of the region as 912, 957 thousand as of 2015. It has ten municipalities and one city, Koronadal. Koronadal has a population of 174,942. The major ethnicities in the entire region are people from Panay Island comprising 469, 689 thousand people or 51% of the entire population of South Cotabato. Of the 51%, 1.77% speak Aklanon (native language of Aklan), 1.88% speak Karay-a (also termed old Hiligaynon usually spoken by the people from Antique) and 96.33% speak Hiligaynon with origins from Capiz and Iloilo.[6]

This paper called attention to the migration from Panay Island to the South Cotabato area. It investigated and obtained the clinical picture of XDP cases in this region, particularly in Koronadal City. It intended to identify cases, describe their natural history, and submit them for inclusion in the national registry. It aims for surveillance of XDP cases to be extended to this region with a sizeable Ilonggo population of Panay ancestry.

METHODOLOGY

Population

All XDP patients living in Koronadal City who were screened using the X-linked dystonia Parkinsonism screening tool (Appendix 1A) were invited to join the study. Patients were included if they were diagnosed with XDP and living in Koronadal City, South Cotabato, or they were undiagnosed but had symptoms of XDP and were living in Koronadal City. Patients with other known movement disorders were excluded from the study. Informed consent (Appendix 1B) was obtained by the authors from each patient prior to their enrolment. This informed consent was in English and Hiligaynon.

Methods

This is a descriptive study approved by the Institutional Review Board in a tertiary medical institution.

The study began with a learning session on XDP with 120 midwives and barangay health workers. After the session, they were directed by the city health officer to do case finding and to screen possible cases using the XDP screening tool (Appendix 1A). After obtaining informed consent, participants were subject to a face-to-face structured interview using the data collection form (Appendix 1C) to determine demographic data, family profile, and clinical features of the disease. Specialized neurological examination using the X-linked dystonia Parksinsonism-Movement Disorder Society of the Philippines (XDP-MDSP) rating scale was obtained from the participants.

The screening questionnaire for XDP was developed to identify prevalence of the disease. It is a simple, easy to use, community-based screening questionnaire for the diagnosis of XDP.[7]

The XDP-MDSP is a validated rating scale formulated to rate the severity of Dystonic, Parkinsonian, and non-motor symptoms of patient with XDP and their effects on the patients' activities of daily living (Appendix 1D).[5] The scale has 5 subscales. Most parts of the rating scale are clinician-administered (Parts I, II, IIIA, and V) and the other parts are answered by either the patient and/or his/her caregiver (Parts IIIB and IV).

Statistical analysis

Data were tabulated as frequencies and percentages. Descriptive statistics such as mean, median, range and standard deviation were tabulated for quantitative variables; proportions were tabulated for qualitative variables.

RESULTS

The midwives and barangay health workers were able to screen a total of 187 patients. The screening tool for XDP was used and a total of nine participants from Koronadal City were brought in by midwives and barangay health workers. Of these nine patients, four were evaluated to have possible XDP based on age, sex, clinical presentation and positive family history. The other two were more likely Parkinson's disease, while the remaining three were more likely from a structural problem.

Table 1 shows a comparison of the prevalence of XDP among the different provinces of Panay with Koronadal City. With a population of 174, 942 and four cases of XDP, the prevalence in Koronadal City is 2.28 per 100,000. All four participants with XDP were males between 41-50 year of age.

Table 1. Prevalence of X-linked dystonia Parkinsonism

POPULATION (per 100,000)	PREVALENCE
Philippines	0.31
Panay	5.74
Capiz	23.66
Aklan	7.72
Iloilo	1.43
Antique	0.86
Guimaras	0.73
Koronadal	**2.28**

Three families were affected, all having a positive family history, and all coming from the province of Iloilo. The clinical features of these patients (Table 2) show a mean age of onset of 38.25 (range 37-40) years old, and a mean age at initial examination of 40.25 (range 38-45 years old). The mean duration of illness from onset to present is 3.5 years and the mean duration of illness from onset to generalized dystonia was 2.75 (range 2-4) years.

Three of these patients initially presented with craniofacial symptoms like blepharospasm, facial twitching, and jaw opening. One presented with upper extremity symptoms described as dystonic movements of the right hand. All of these patients presented with generalized dystonia on examination.

Table 2. Clinical Features of Patients with XDP in Koronadal City

Variable	
Mean age at onset (years)	38.25 (37-40)
Mean age at initial examination (years)	40.25 (38-45)
Mean duration of illness from onset to present (years)	3.5 (2-5)
Mean duration of illness from onset to generalized dystonia (years)	2.75 (2-4)
Mean duration of illness from onset to predominant Parkinsonism	0
Number of cases initially presenting with parkinsonism	0
Number of cases initially presenting with dystonia	100 %
Craniofacial (%)	75%
Cervical/Shoulder (%)	0
Trunk (%)	0
Upper Extremities (%)	25%
Lower extremities (%)	0
Number of cases with spread (%)	100%
Number of patients with predominantly dystonia	4
Number of patients with predominantly Parkinsonism	0

DISCUSSION

This is the first research on XDP outside of Panay Island. There are ten municipalities and one city in South Cotabato.[7] In this study, the city of Koronadal was chosen to be investigated first since it is the most populated, and was the first area where migrants from Western Visayas were brought during the pre and post war migration.[5-6] Also, Koronadal City has more access to healthcare and transportation, making it easier to track down cases. Only four cases were seen in Koronadal City. The prevalence rate of 2.28 percent could be an underestimation since the screening per barangay was done by midwives and barangay health workers. It is possible that subtle signs and symptoms of the disease were missed.

The clinical presentation of XDP of the patients in this series all bear similarities to the 312 surviving cases of XDP in a study in 2011.[1] The mean age of onset at 39.67 and mean age at initial examination of 44 years is similar to this study at 38.25 and 40.25 years, respectively. The mean duration of illness from onset to generalized dystonia in the 2011 study is 4 years, while in this paper it is slightly shorter at 2.75. In the 2011 paper, 31% presented with lower extremity complaints followed by craniofacial complaints at 28%, while in our study 3 out of the 4 patients (75%) presented with craniofacial complaints initially. However, having only 4 patients is not enough representation to draw conclusions from. A wider study involving all XDP patients in South Cotabato would provide a better comparison to the 2011 paper.

It is worth mentioning that there were eleven more patients examined for possible XDP but they were living in other municipalities of South Cotabato. Of the 11 patients, one was female and ten were males. All had a positive family history and all came from the provinces of Capiz, Iloilo, and Aklan. Most presented with dystonia and others already had predominant Parkinsonism. They learned about the evaluation by word of mouth and by recommendation of internists and neurologists in South Cotabato. They were not included in the screening since this study was limited to Koronadal City. Hence, an expansion of this study to the other municipalities of South Cotabato is warranted. It is possible that most patients with XDP decided to settle outside Koronadal City to less populated municipalities due to several factors that can be investigated by future studies. It is of value to offer genetic testing to all of these patients to confirm the disease and to provide genetic counseling. Training of neurologists and internists in the identification and management of XDP, including chemodenervation with Botulinum toxin A is needed.

XDP of Panay Island has spread to different areas due to migration. The cases assessed from Koronadal City and other areas of South Cotabato all bear a similar phenomenology to the cases described with patients in Panay Island. With the knowledge of the migration of people from Panay Island to South Cotabato in Mindanao and the discovery of possible XDP cases through this study, research work should be expanded to this region where the knowledge about the disease is lacking, and help extended to XDP sufferers.

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