

Motor characteristics and functional disability in patients with idiopathic Parkinson's disease in Hai, Tanzania

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1. Background

- The cardinal motor signs of Parkinson's disease (PD) are bradykinesia, resting tremor, rigidity and postural instability¹
- The prevalence and incidence of PD increase with age². In Tanzania, the population is rising at one of the greatest rates globally³, so PD will be of increasing importance in Tanzania in the coming decades
- Poor access to PD medication has been demonstrated in Sub-Saharan Africa⁴ (SSA) and is likely to result in a greater burden of motor symptoms
- Motor symptoms lead to a loss of independence in PD patients⁵
- Despite this, there is a paucity of research on PD in Tanzania, including the characterisation of motor symptoms and disability

2. Aims

- To investigate the characteristics and burden of motor symptoms, and the level of disability amongst medication-naïve people with PD in the Hai district, Tanzania

3. Methods

Study design

- Observational, cross-sectional study in Hai, a rural Tanzanian district (**Figure 1**)
- Part of a mixed method project researching PD in seven countries in SSA

a) Community screening

- A door-to-door screening questionnaire, containing the cardinal signs of PD, was completed by households in the 64 villages of the Hai district in May 2023

b) Community assessment and diagnosis

- Positive responders were examined for signs of PD in their local communities from May 2023 (**Figure 2**)
- A consultant neurologist then established diagnoses of PD at Kilimanjaro Christian Medical Centre, Tanzania

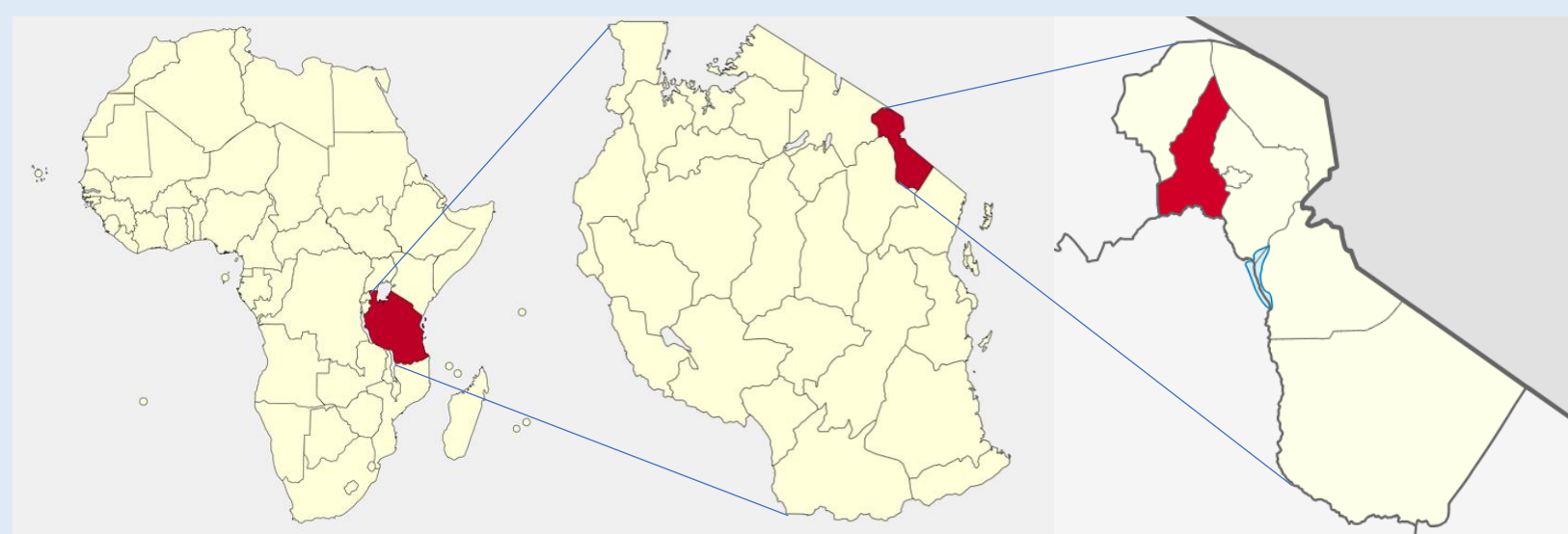


Figure 1 – From left to right, map displaying Tanzania, the Kilimanjaro district, and the Hai district in red, respectively⁶

c) Quantitative data collection – May 2023 to May 2024

- Certified assessors used the Movement Disorder Society-Unified Parkinson's Disease Rating Scale⁷, a physical examination, to quantify the severity and subtype of motor signs
- Functional disability was quantified using the Barthel Index⁸, which rates the self-reported level of independence for 10 daily activities
- Validated cut-off values were used to classify the burden of motor signs and the level of disability in each participant



Figure 2 – Health centre (left) and local community (right) where assessments were conducted

4. Results

- 21 medication-naïve people with PD were identified in the district
- 17 of the 21 participants (81%) displayed a moderate or severe level of disability (**Figure 3**)

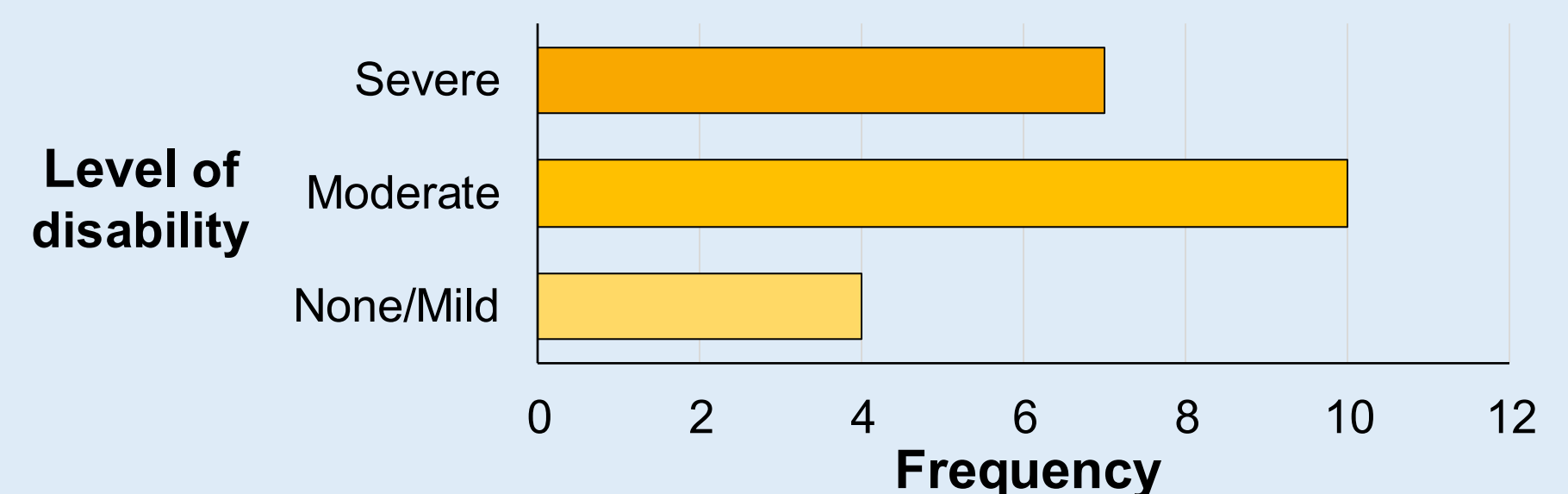


Figure 3 – Bar chart showing the level of disability in study participants

- The most common motor subtype was tremor-dominant PD, accounting for 15 of the 21 participants (71%) (**Figure 4**)
- The most severe motor signs were slow, interrupted, or hesitant movements in the upper limbs
- The burden of motor signs amongst the cohort was classified as severe

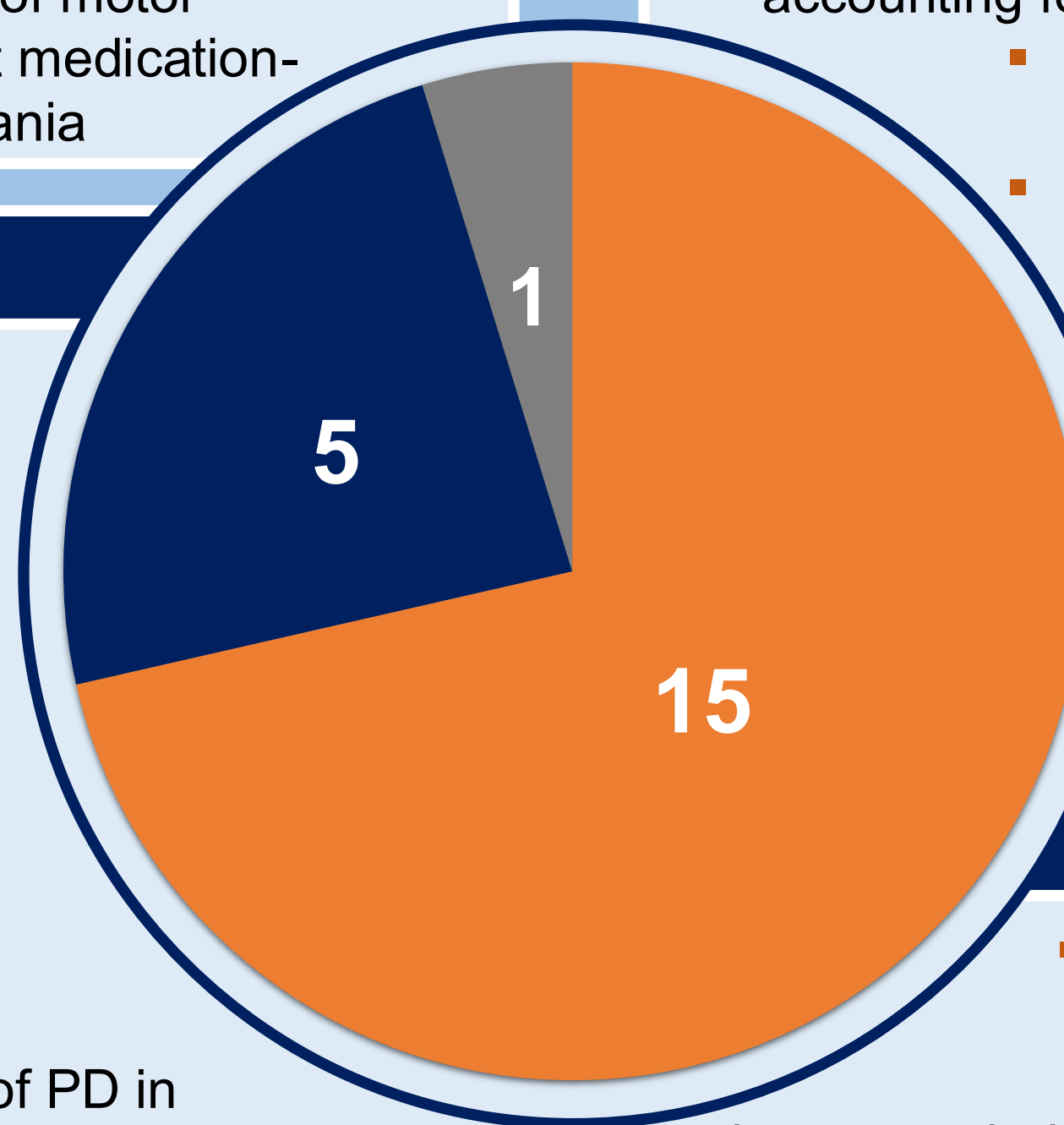


Figure 4 – Pie chart showing the frequency of motor subtypes in study participants

- Tremor-dominant
- Postural instability and gait difficulty (PIGD)
- Indeterminate

5. Implications

- The burden of motor symptoms in this cohort was greater than in PD patients in multiple Western countries⁹. **Earlier detection of PD** must become prioritised in Hai, because the greater the burden of motor symptoms at diagnosis, the quicker the stages of PD progress¹⁰
- The preponderance of the tremor-dominant subtype reflects previous findings in SSA¹¹. The PIGD subtype, however, has been associated with quicker progression of motor symptoms and more complications in PD patients outside of Africa^{12,13}
 - Thus, the symptoms will be reassessed in each country for two years to **understand the progression of motor symptoms in African cohorts and to stratify patients' risk of complications**
- A greater proportion of participants demonstrated moderate or severe disability compared to a 2015 study on PD in the Hai district¹⁴. Those with disabilities are often cared for by family, as Tanzania lacks a formal social support system¹⁵. Therefore, there is an opportunity to **strengthen the education of family members on PD management**
- Data collection was limited by factors such as road infrastructure, weather conditions (**Figure 5**), and transport availability. Thus, four newly diagnosed patients started taking PD medication before data collection, which limited definitive conclusions



Figure 5 – Flooded road in highlands of Hai during high rainfall season

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