MUTATIONS IN THE PARKIN GENE ARE A MINOR CAUSE OF PARKINSON'S DISEASE IN THE SOUTH AFRICAN POPULATION

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Introduction: Mutations in parkin are the most common cause of autosomal recessive early-onset Parkinson's disease (PD), being found in up to 50\% of such cases in some populations. A broad spectrum of parkin mutations have been identified, including numerous whole exon rearrangements, to which parkin is particularly susceptible.

Our group had previously reported that parkin mutations do not significantly contribute to PD pathogenesis in 91 South African PD patients. This present study expands on our previous publication by the mutation screening of an additional 138 patients.

Aims: To determine the frequency of parkin mutations in a group of South African PD patients.

Methods: A total of 229 unrelated PD patients (mean age at onset 54.4 years) were recruited, with the majority of patients meeting the UK PD Society Brain Bank Research criteria for PD diagnosis. Parkin mutations were detected using high-resolution melt analysis, direct sequencing and multiplex ligation-dependent probe amplification analysis.

Results: In total, our study identified seven point mutations, a frameshift mutation and seven whole exon rearrangements. One Caucasian patient was found with a novel heterozygous exon 2 to 6 duplication, as well as a heterozygous exon 5 duplication. Parkin mutations were detected in nineteen of 229 (8.3\%) PD patients.

Conclusion: Our results demonstrate that parkin mutations do not significantly contribute to PD pathogenesis in the South African population. It could be speculated that potentially novel PD-associated genes might underlie the molecular etiology of PD in the unique Black, Mixed ancestry and Afrikaner sub-populations of South Africa.