

PP 20 - Implementation of a technique to find out genetic variants on X-linked mental retardation (XLMD) in the Sri Lankan patient cohort

W. A. G. M. K. Weerathunga^{1*}, N. Noordeen¹, T. K. Wetthasinghe¹, D. Hettiarachchi¹,
V. H. W. Dissanayake¹

Human Genetics Unit, Faculty of Medicine, University of Colombo, Sri Lanka

Introduction: A person is considered intellectually disabled (ID) if an intelligence quotient less than 70-75. Mental retardation (MR) found in ~1-3% of the population, impacting the lives of affected individuals and their families. Approximately 30% of more males with ID having effected X-chromosomal genes. Genetic causes accounted for 38.5% of all cases of intellectual disability. Aristaless related homeobox *ARX* gene, is Frequently mutated causing X-linked intellectual disability (XLID). The objective of the study was to design and implement a PCR assay for detection of pathogenic variants in the *ARX* gene (*ARX* T>C; rs28936077) associated with XLMD.

Methods: A comprehensive literature review was conducted to determine the association of genetic variants in XLMD. A tetra-amplification refractory mutation system polymerase chain reaction (T-ARMS PCR) was designed for the *ARX* T>C; rs28936077 genetic variant. The designed assay was optimized and validated by Sanger sequencing, using the DNA of 14 venous blood samples, that were obtained from a cohort of patients with mental retardation who had given prior informed consent for such studies.

Results: The genotypic frequencies for the normal variants were 100%. There were no heterozygotes or homozygotes for the pathogenic variant in the current study cohort.

Conclusion: Designing, optimization and implementation of the tetra-amplification refractory mutation system polymerase chain reaction (T-ARMS PCR), as a novel PCR assay was successful and can be used as a diagnostic tool to detect the presence of *ARX* T>C; rs28936077 genetic variants in patients with mental retardation. Further studies should be conducted on larger study cohort to determine the allele frequency of the Sri Lankan population.

Keywords: Tetra-ARMS PCR, *ARX*, X linked mental retardation

*Email: manoj_weerathunga@yahoo.com