EFFECT OF MONOAMINE OXIDASEA (*MAOA)* ALLELIC VARIANTS AND CHILDHOOD MALTREATMENT ON VIOLENT BEHAVIOUR: PRELIMINARY INVESTIGATION ON CONVICTS IN SRI LANKA

J.C. Mendis [1], N.D.S. Goonawardhana[2], M.R. Abeykoon[3], T.S.P. Fernando[1], C.D. Jayasinghe[1*]

[1]Department of Zoology, The Open University of Sri Lanka
[2]Biomedical Laboratory -2, Kotelawala Defense University, Ratmalana
[3]Faculty of Science, Horizon Campus, Malabe

Criminal violence imposes a massive burden on the economy, health care and law enforcement of a country. Hence, the deterrence of criminal violence is an important public health issue. Recently, much emphasis has been given to genetic predispositions in individual variations of violent behaviour. The activity shown by the MAOA enzyme coded by the MAOA gene has two major impacts on the neurotransmitter functionings in an individual whereas the high activity allelic variant of Monoamine Oxidase-A gene (H-MAOA) results in depressive behaviours in individuals while the low activity allelic variant of Monoamine Oxidase-A gene (L-MAOA) which results in the accumulation of serotonin is implicated in the development of violent behaviour. Further, genetic predisposition towards violent behaviour could be triggered by socioenvironmental factors such as childhood maltreatment. Therefore, the present study investigates the effect of MAOA allelic variants and childhood maltreatment and their interplay on violent behaviour of convicts imprisoned in Sri Lanka. Male convicts' categories as violent (N=31), non-violent (N=29) in Welikada Prison, Borella and age-sex matched individuals without any criminal record (normal control, N=31) were recruited for the study. All participants were surveyed for childhood maltreatment using the Childhood Trauma Questionnaire (CTQ). DNA was purified from buccal swabs obtained from participants and a Polymerase Chain Reaction (PCR) was carried out to detect MAOA allelic variants. The distribution of allelic variants and scores of CTQ were statistically compared. The PCR implication has resulted in 230 bp and 260 bp DNA fragments that resemble the 3R (L-MAOA) and 4R (H-MAOA) allelic variants of the MAOA gene, respectively. The L-MAOA variant exhibited a higher prevalence among the violent group while the H-MAOA variant predominated in both non-violent and control groups (P=0.04) indicating a genetic influence on violent behaviour. The CTQ scores obtained for emotional abuse (P=0.04, F=5.94) physical neglect (P=0.01, F=4.9) and physical abuse (P=0.00, F=14.1) were also significantly higher in the violent group than the other groups. However, physical abuse (P=0.04, F=4.84) and sexual abuse scores (P=0.03, F=5.18) were significantly higher among individuals who have committed violent crimes having the H-MAOA allelic variant. Thus, it could be inferred that childhood maltreatment may contribute to violent behaviour regardless of genetic influence in individuals in Sri Lanka. However, further studies are currently

evaluating the potential interplay between MAOA alleles and environmental vulnerability factors. This pilot study may initiate a new area of investigation in behavioural genetic studies in Sri Lanka and will be beneficial to understand the multiple factors contributing to criminal violence in Sri Lanka.

Keywords: Violence behaviour, Convicts, *MAOA* gene, Childhood maltreatment, Sri Lanka

**Corresponding author: cdjay@ou.ac.lk*