NON-INVASIVE PHENOTYPIC PROXIES FOR GENETIC AND EPIGENETIC VULNERABILITY TO SUBSTANCE DEPENDENCE AMONG SRI LANKAN YOUTH IN RESIDENTIAL REHABILITATION

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Abstract

Genetic and epigenetic testing for substance use disorder risk is infeasible in resource-limited Sri Lankan rehabilitation settings. This study described three non-invasive phenotypic indicators (family-history density, Adverse Childhood Experience (ACE) score and impulsivity) and tested associations with onset age, relapse frequency and dependence. The Family History Density Score (FHDS) is a weighted count of affected relatives, not measured genetic loading; ACE records reported childhood adversity, not NR3C1 methylation. A descriptive cross-sectional survey was completed by 224 residents aged 18–35 years at five centres: National Dangerous Drugs Control Board (NDDCB) Talangama Centre and Mithuru Mithuro Movement branches in Pelmadulla, Kuruwita, Gampaha and Piliyandala. Questionnaire administration was approved by the NDDCB Board of Directors and reviewed and approved by the Mithuru Mithuro Movement research division; written informed consent was obtained from all participants. Unadjusted analyses used Spearman correlation, Mann–Whitney, Kruskal–Wallis and negative binomial regression. Mean FHDS was 3.66/8 (SD 1.54) and mean ACE 3.00/10 (SD 1.40); 34.4% scored ACE ≥4; 52.2% reported polysubstance use and 76.3% prior relapse. FHDS was not associated with age of onset (Spearman $\rho = -0.069$, 95% CI −0.198 to 0.063, $p = 0.301$) or relapse frequency ($\rho = -0.028$, 95% CI −0.159 to 0.103, $p = 0.678$). Combined high-FHDS and ACE ≥4 status did not differ from single or no identified risk on binary dependence (Mann–Whitney $W = 6027$, $p = 0.148$), and impulsivity did not moderate the FHDS–relapse association ($p = 0.161$). The design supports association only, not genetic or epigenetic mechanism. Family-history and ACE enquiry are low-cost at intake and both exposures are common, but these data do not validate them as a screening tool, and they must not replace clinical judgement. High-prevalence profiles offer only a low-cost sampling frame for future genotyping and epigenetic studies.

Keywords: Substance use disorder, Adverse childhood experiences, Family-history density, Residential rehabilitation, Sri Lanka