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Personalized treatment of ADHD probands: Potential role of dopaminergic transporter variants identified in Indians

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Lack of inhibition, poor decision making and scholastic backwardness are major weaknesses observed in Attention Deficit Hyperactivity Disorder (ADHD) probands. Extensive research indicates contribution of neurotransmitters, chiefly dopamine (DA)/norepinephrine (NE) and hence, medications have been developed targeting these systems. However, due to broad variation in response, treatment is often discontinued. We analyzed role of DA/NE gene variants, DRD4 exon 3 VNTR, rs28363170, rs3785143, rs1611115 and rs4680, in treatment response. ADHD probands diagnosed following the diagnostic and statistical manual for mental disorders-IV were evaluated by the Conners' Parent Rating Scale-revised (CPRS-R) to estimate the behavioural problems, inattention, hyperactivity and ADHD index. Peripheral blood collected from drug naïve ADHD probands, after obtaining informed written consent for participation, was used for genomic DNA isolation and analysis of gene variants. Probands were prescribed either Methylphenidate (MPH) or Atomoxetine (ATX) and post-treatment outcome was assessed using the CPRS-R. This pioneering study on Indian ADHD probands revealed more pronounced side effects after MPH treatment as compared to ATX. Gene variants showed correlation with MPH and ATX induced improvement. Quantitative trait analysis also revealed significant association between rs28363170/rs3785143 variants and response to medication. It may be inferred from the study that rs28363170 and rs3785143 could be major modulators for treatment outcome in this population; while MPH may be more beneficial in presence of rs28363170 10R and rs3785143 T variants, ATX treatment may provide relief in presence of rs28363170 9R and rs3785143 variants.

Biography

Kanchan Mukhopadhyay has completed her PhD from Calcutta University and received Post-doctoral training at Tumour Laboratory, Tokyo, Japan. She is the Chief Scientist of Manovikas Biomedical Research and Diagnostic Centre, Kolkata a premier non-government organization in the eastern India for training and rehabilitation of intellectually challenged children. She has published more than 75 articles in reputed journals and had guided 11 graduate students leading to PhD.

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