

## **Artificial Neural Network Based Classification Rule for Classifying Dysglycemic Asian Indians in north India**

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Prediabetes forms an intermediate stage in the natural history of type 2 diabetes mellitus (T2DM). Increasing prevalence of prediabetes and T2DM world wide and in India is of prime public health concern. Methods to identify those at high risk for developing prediabetes and diabetes are needed. The Objective of the study was to develop a classification rule using artificial neural network (ANN) for classifying normoglycemia from dysglycemia (i.e. FPG  $\geq 100$ mg/dl) in Asian Indians in north India. Data were taken from two epidemiological studies carried out in New Delhi. ANN was used to develop the classification rule by splitting the study sample (n=582) into training dataset (75%) and validation dataset (25%). The input variables were demographic profile, family history of diabetes, physical activity levels (PAL), and anthropometric, clinical and metabolic profile. The sensitivity (95% CI), specificity (95% CI), and area under Receiver Operating Characteristics Curve (aROC) (95% CI) of the classification rule for the training dataset was 71.7% (62.9, 79.3), 58.7% (53.0, 64.2) and 0.73 (0.68, 0.78) and for validation dataset was 73.8% (57.9, 86.1), 64.1% (54.0, 73.3) and 0.72 (0.64, 0.81), respectively. This classification rule developed can be used to help the physicians for identifying persons at risk for prediabetes and diabetes. Early identification of prediabetes would help in application of intervention strategies for prevention of diabetes. Further studies are required for identifying predictors for both impaired fasting glucose (IFG) and impaired glucose tolerance (IGT) using improved ANN methodologies so that its “learning process” could be shorter and more accurate.