Type 1 Diabetes Care: The West Bengal Model

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Type 1 diabetes (T1D) management is complex and requires a multifaceted approach. This includes daily multiple insulin injections, home monitoring of blood glucose, screening for potential complications, and patient education and support. Many T1D patients face untimely death due to lack of structured and timely care.[1] India has the highest number of children and adolescents (aged 0–19 years) living with T1D,[2] but there is no national health program or policy targeting this population.[3] The average life expectancy for a person diagnosed with T1D in India is only 29 years.[2]

In West Bengal, India, a structured model of care (West Bengal Model) for T1D was initiated with support from the Government of West Bengal to provide comprehensive health care to all patients living with T1D.[4,5] The model was developed along the lines of "intermediate care," which is recommended as the standard of care for T1D in low-resource settings.[6,7] This provides structured care that includes essential components such as multiple daily insulin injections (basal-bolus regimen of insulin treatment), regular home blood glucose monitoring, quarterly testing of glycated hemoglobin (HbA1c), annual screening for diabetes-related complications, and structured age-appropriate patient education and support including self-management of disease, dose adjustment, nutrition, meal planning, exercise, and sick day rules.[6,7]

The model was launched by piggybacking on the existing adult National Program for Prevention and Control of Non-Communicable Diseases (NP-NCD). There was no need for additional infrastructure or staff recruitment because the model made use of both physical infrastructure and human resources available in existing noncommunicable disease (NCD) clinics. Initially, it was implemented as a pilot project in five health districts in West Bengal, where model T1D clinics were established in each district hospital. After conducting needs assessment in the form of initial site visits, dedicated identified staff were rigorously trained to deliver care for T1D patients. Patients who were previously receiving unstructured care at tertiary hospitals in Kolkata were counseled and shifted to these new model clinics where the basal-bolus insulin regimen was the standard of care followed.[4,5]

An important aspect of this model is the provision of government-funded supplies to enrolled patients. With support from the state government and partial funding from the central government, patients receive insulin (regular insulin and glargine insulin), insulin syringes (both 100 IU and 40 IU), glucose measuring devices, blood glucose test strips, lancing devices, and lancets free of cost. Additionally, patient data are recorded and updated in electronic registry and physical formats, ensuring continuous monitoring and evaluation.[4,5]

The clinics are run by physicians, pediatricians, nurses, NCD counselors, and data entry operators, who underwent intensive training to deliver care. Despite the lack of specialized staff like diabetes educators or dietitians, nurses and NCD counselors were trained to provide basic nutritional advice and psychological support. This ensured that patients and their families are not only receiving medical treatment but also counseling on how to manage the disease in their daily lives. Patients are rigorously monitored on a monthly basis.[4,5]

One of the key operational strategies was to ensure that insulin and other supplies are dispensed directly from the T1D clinics, separate from the main hospital pharmacies. This streamlined the supply chain and made stock maintenance more efficient. Each patient is given an identity card, a logbook to track daily blood glucose readings, and educational materials in local languages to help them in self-management of the disease.[4,5]

The impact of the model on clinical parameters, psychological well-being, and financial burden on families was assessed and documented over 2 years. After 2 years, there was significant improvement in health outcomes, particularly in glycemic control, as indicated by lower glycated hemoglobin (HbA1c) values. The frequency of weekly blood glucose tests increased due to active counseling and availability of free blood glucose test strips. There were no reported cases of diabetic ketoacidosis, diabetes-related hospitalizations, or deaths during the study period. Episodes of hypoglycemia were also reduced, and there was a significant improvement in psychological well-being of both patients and their caregivers. There was also a reduction in both direct and indirect expenditures incurred by patients' families for managing T1D. These results were achieved despite the majority of the patients belonging to lower socioeconomic background and most of their parents not having completed primary education.

The success of this model has demonstrated that structured care for T1D can improve health outcomes, even in resource-limited settings. By using existing infrastructure and receiving government support, the model has proven to be both scalable and sustainable. Based on its success, the Government of West Bengal has given us permission to scale it up to cover the next 10 out of the remaining 22 health districts in West Bengal in phases. This has also been approved by the Central Government (National Health Mission) for Program Implementation Plan starting April 1, 2024.

We have provided inputs to the T1D section of the proposed national health policy on NCDs in children of the Government of India. Once launched, model T1D clinics will be established in every district hospital of India, where individuals with T1D will receive intermediate care, based on our model (West Bengal Model). Several state governments have shown interest in implementing this model in their states and have reached out to us. The United Nations International Children's Emergency Fund (UNICEF) and Breakthrough T1D along with their India partner William J Clinton Foundation (WJCF) have visited our model clinics and scoped whether they would be able to help and support other state governments to provide government-funded intermediate care by adopting/modifying our model. Based on our model

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in partnership with WJCF and their respective state NCD cells, Rajasthan, Madhya Pradesh, Uttarakhand, and Gujarat have started pilot programs in their respective states.

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Author Contributions

Sujoy Ghosh conceptualized the model and reviewed the draft manuscript. Masuma Yasmin was responsible for implementation of the model and wrote the first draft of the manuscript.

Conflict of Interest

None.

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