

India-Specific Severity Prediction Tool for Sickle Cell Anaemia

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Why in News?

Recently, scientists at the CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad, developed India-specific disease severity scoring models—ISS1 and ISS2 (India-specific Severity Score).

- It aims to accurately predict clinical outcomes and manage treatment in Indian patients with **Sickle Cell Anaemia (SCA)**.
- It addresses a critical void, standard international scoring models like the **Paediatric Severity Score (PSS)** failed to reflect the true clinical progression of Indian patients.

The Need for an India-Specific Model

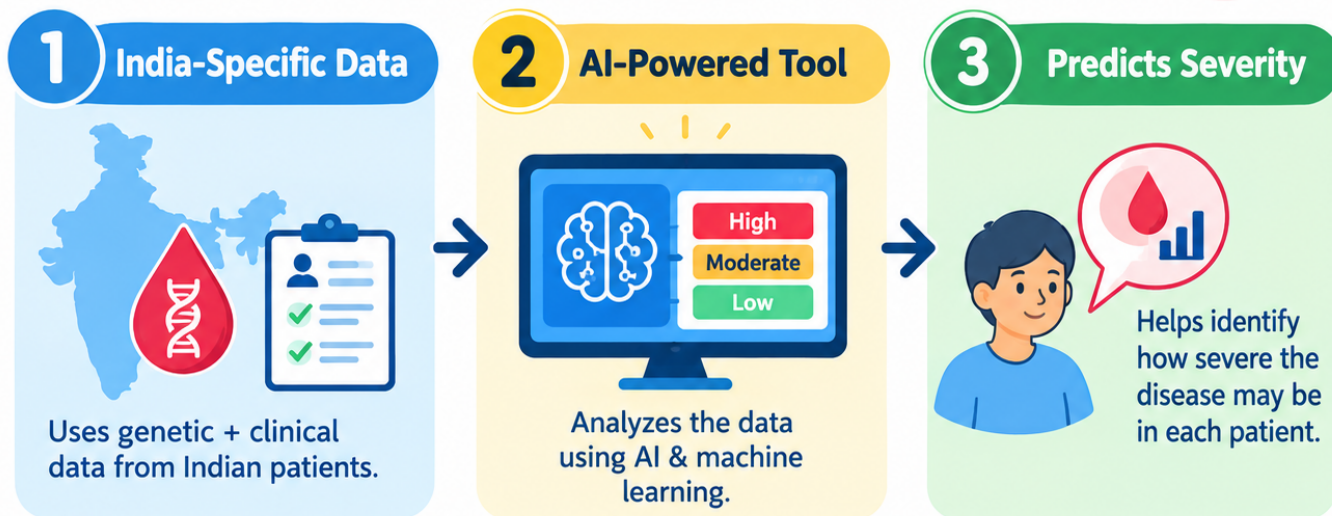
- Indian SCA patients often display a distinct clinical profile compared to African and Western populations.
- They generally possess higher baseline levels of **fetal hemoglobin (HbF)**, which tempers disease severity.
- Complications predominant in African populations such as priapism, leg ulcers, and severe pulmonary hypertension are relatively rare in India.
- Conversely, severe anemia, recurrent blood transfusions, painful vaso-occlusive crises, and acute febrile illnesses driven by nutritional deficiencies and endemic tropical infections dominate Indian clinical cases.
- The standard international Paediatric Severity Score (PSS) achieved only **~67% concordance** with expert clinical assessments in Indian settings.



CSIR-CCMB
Centre for Cellular and
Molecular Biology

India-Specific Tool to Predict Sickle Cell Severity

Better prediction. Better care. Brighter futures.



Why It Matters?



More accurate
risk assessment



Personalised
care plans



Better treatment
decisions



Improved outcomes
for Indian patients



*A step towards a **healthier tomorrow***

Key Features: ISS1 and ISS2 Models

Feature / Model	ISS1 (Modified Clinical Model)	ISS2 (Simplified Clinical Model)
Accuracy / Concordance	Reached ~83% concordance with expert pediatric evaluation.	Achieved ~85% concordance and correctly identified 100% of mild cases.
Core Innovation	Integrates clinical indicators prevalent in Indian patients (frequent transfusions, severe anemia, acute febrile episodes).	Relies on easily observable bedside clinical indicators rather than complex, high-cost laboratory diagnostics.
Primary Utility	Facilitates nuanced clinical stratification for secondary/tertiary hospitals.	Designed for resource-constrained primary healthcare centers (PHCs) to quickly triage patients.

Significance

- **Targeted Drug Dosage** -Helps clinicians determine early, tailored administration and exact dosages of **Hydroxyurea**, a essential drug that elevates HbF levels and prevents painful vaso-occlusive crises.
- **Support for National Sickle Cell Anaemia Elimination Mission (2023-2047)**- Directly

supports India's mission to eliminate sickle cell disease by 2047 through early screening, risk-stratification, and targeted management across tribal belts.

- **Decoupling from Expensive Diagnostics-** ISS2 enables rural healthcare providers to stratify risk without requiring specialized molecular or expensive biochemical laboratory setups.

Reference

[The Hindu | India-specific tool to predict Sickle Cell severity](#)

