

CORPORATE OFFICE

Delhi Office

706 Ground Floor Dr. Mukherjee
Nagar Near Batra Cinema Delhi -
110009

Noida Office

Basement C-32 Noida Sector-2
Uttar Pradesh 201301



Date: 5 June 2024

ORAL FORMULATION OF HYDROXYUREA

THIS ARTICLE COVERS 'DAILY CURRENT AFFAIRS' AND THE TOPIC DETAILS OF "**ORAL FORMULATION OF HYDROXYUREA**". THIS TOPIC IS RELEVANT IN THE "**SCIENCE AND TECHNOLOGY**" SECTION OF THE UPSC CSE EXAM.

Why in the News?

The Indian Council of Medical Research(ICMR) is seeking expressions of interest in collaborating on the development and commercialisation of a pediatric or low-dose oral formulation of hydroxyurea for treating sickle cell disease in children. This effort focuses on creating a formulation tailored to meet the specific demands of pediatric patients.

WHAT IS HYDROXYUREA?

- Hydroxyurea, an oral medication frequently utilised in sickle cell anaemia treatment, functions as an antimetabolite, impeding DNA replication and repair. Thus, it exhibits efficacy against cancer cells.
- Its mechanism involves stimulating the production of fetal hemoglobin (HbF) in the bloodstream, consequently mitigating the formation of sickle-shaped red blood cells. These distorted cells, known for their reduced flexibility, often obstruct blood flow, precipitating pain and potential organ impairment. By elevating HbF levels, hydroxyurea diminishes the frequency of painful crises and the necessity for blood transfusions, thus alleviating the patient's quality of life.
- Furthermore, it demonstrates the potential to reduce the likelihood of severe complications like acute chest syndrome and stroke.

WHAT IS SICKLE CELL ANAEMIA?

Sickle cell anaemia is an inherited blood disorder distinguished by the production of abnormal haemoglobin, also known as sickle haemoglobin, within red blood cells. This

condition leads to the distortion of RBCs into a sickle or crescent shape, particularly under conditions of low oxygen.

Symptoms

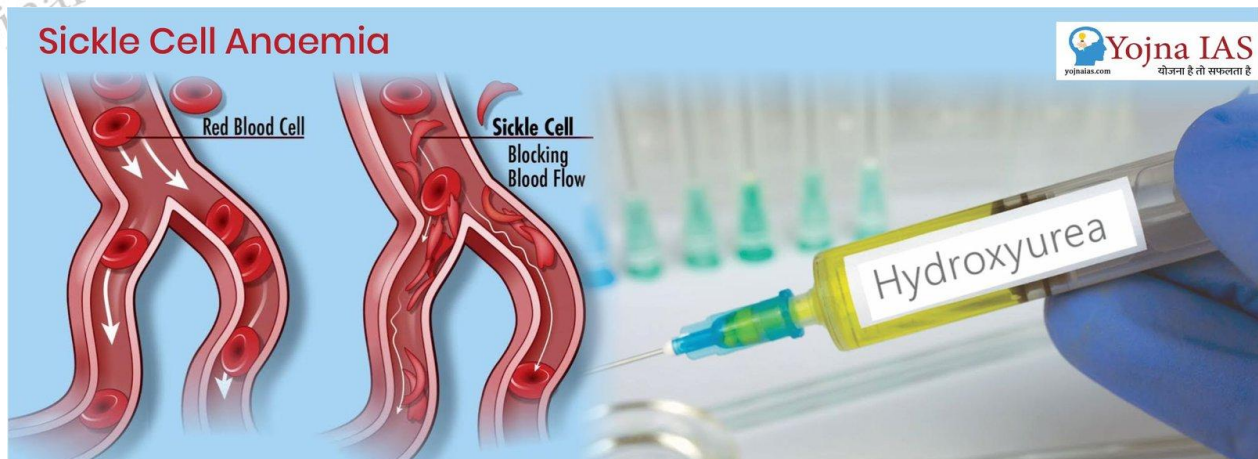
- **Painful Episodes (Crises):** These are sudden episodes of severe pain caused by sickle-shaped cells blocking blood flow to parts of the body. Pain can occur in the bones, chest, abdomen, and joints.
- **Anaemia:** Sickle cells break apart easily as these cells become rigid, leading to a shortage of red blood cells (anaemia). This can cause fatigue, weakness, and shortness of breath.
- **Swelling:** Painful swelling of hands and feet.
- **Frequent Infections:** Sickle cell anaemia can damage the spleen, an organ that fights infection, making patients more vulnerable to infections.
- **Delayed Growth:** In children, anaemia can slow growth and delay puberty in young.
- **Vision Problems:** Lack of blood supply to the eyes, leading to vision issues.

Occurrence

- Sickle cell anaemia mostly occurs in people of African descent but also occurs in Hispanic, Middle Eastern, Indian, Latin American, and Mediterranean populations. In the United States, it affects about 1 in 365 African American births and 1 in 16,300 Hispanic American births.

Treatment and Management

- **Hydroxyurea:** A medication that increases fetal hemoglobin production, reducing the frequency of pain crises and the need for blood transfusions.
- **Blood Transfusions:** These can treat anaemia and reduce the risk of stroke.
- **Bone Marrow Transplant:** The only potential cure, primarily used in severe cases, involves replacing affected bone marrow with healthy bone marrow from a healthy donor.
- **Pain Management:** Medications and therapies to manage pain during crises.
- **Preventive Measures:** Vaccinations and antibiotics to prevent infections.



BENEFITS OF HYDROXYUREA

Hydroxyurea is an important medication for treating sickle cell anaemia, and its broader usage can significantly enhance the accessibility and effectiveness of treatment. Here are several ways in which hydroxyurea contributes to more accessible and effective management of sickle cell anaemia:

- **Proven Efficacy and Safety**
 - **Reduction in Symptoms:** Hydroxyurea is effective in increasing fetal hemoglobin levels, which reduces the frequency of painful crises, decreases the incidence of acute chest syndrome, and minimizes the need for blood transfusions.
 - **Long-term Benefits:** Long-term studies have shown that hydroxyurea can improve survival rates for patients with sickle cell anaemia.
2. **Oral Administration**
- **Ease of Use:** Hydroxyurea is an oral medication, which makes it easier to administer compared to treatments requiring intravenous access, such as regular blood transfusions.
 - **Home Treatment:** Patients can take hydroxyurea at home, reducing the need for hospital visits and making it more accessible for those in remote or underserved areas.
3. **Cost-Effectiveness**
- **Reduced Healthcare Costs:** By decreasing the frequency of pain crises and hospitalisations, hydroxyurea lowers overall healthcare costs associated with managing sickle cell anaemia.
 - **Affordable Medication:** Hydroxyurea is relatively inexpensive compared to other treatments like bone marrow transplants, making it affordable for healthcare systems and patients.
4. **Wider Availability**
- **Scalability:** Hydroxyurea can be produced and distributed on a large scale, facilitating widespread access even in low-resource settings.
 - **Inclusion in Treatment Protocols:** National health programs and international health organisations can include hydroxyurea in standard treatment protocols, promoting its use globally.
5. **Improved Health Outcomes**
- **Preventive Care:** By effectively managing symptoms and preventing complications, hydroxyurea enables patients to lead more stable lives, reducing absenteeism from work or school.
 - **Enhanced Quality of Life:** Consistent use of hydroxyurea leads to fewer pain episodes and complications, significantly improving the day-to-day well-being of patients.

NATIONAL STRATEGIES IN DEALING WITH SICKLE CELL ANEMIA

- **National sickle cell anaemia elimination mission (nscem):** launched in the union budget 2023, the national sickle cell anaemia elimination mission (nscem) aims to eradicate sickle cell anaemia in india by 2047. The initiative

plans to screen approximately 70 million people and enhance care for all individuals with sickle cell disease.

- **Primary prevention strategies:** the mission focuses on raising awareness and providing pre-marital and pre-conceptual counselling to prevent the birth of children with a homozygous genotype for sickle cell disease.
- **Secondary prevention and screening:** this involves opportunistic outpatient-based screenings, couple counselling, and referring reactive cases for diagnostic confirmation and treatment initiation.
- **Holistic management and continuum of care:** the program aims to deliver affordable, accessible, and high-quality care to all sickle cell disease patients. This encompasses management at primary, secondary, and tertiary healthcare levels, advanced diagnostic and treatment options, integration with ayush systems, patient support, community adoption, and rehabilitation services.
- **Ayushman bharat-pmjay cards:** nscem includes the distribution of ayushman bharat-pmjay cards to ensure that the economically disadvantaged can access quality healthcare without financial burden, promoting healthcare equity.
- **National health mission (nhm):** implemented as part of the national health mission, the program operates in a mission mode to eliminate sickle cell genetic transmission by 2047. It targets universal population-based screening, prevention, and management of sickle cell disease, particularly in tribal and high-prevalence areas across india.

Prelims Based Question

Q. Consider the following statements regarding Sickle cell Anemia:

1. Sickle cell anaemia is a genetic blood disorder.
2. Sickle cell anaemia is exclusively a disease of the elderly population and does not affect children or young adults.

Choose the correct answer using the codes given below:

- (a). 1 Only
- (b). 2 Only
- (c). Both 1 and 2
- (d). Neither 1 nor 2

ANSWER: A

Mains Based Question

Q. What is Sickle cell anaemia? Discuss about the national strategies to eradicate Sickle cell anaemia by 2047

UNITED NATIONS GLOBAL SUPPLY CHAIN FORUM

THIS ARTICLE COVERS 'DAILY CURRENT AFFAIRS' AND THE TOPIC DETAILS OF "UNITED NATIONS GLOBAL SUPPLY CHAIN FORUM.". THIS TOPIC IS RELEVANT IN THE "INTERNATIONAL RELATIONS" SECTION OF THE UPSC CSE EXAM.

WHY IN THE NEWS?

The first-ever Global Supply Chain Forum, hosted by the United Nations Trade and Development (UNCTAD) and the Barbados government, recently concluded successfully. The forum's inaugural edition was held in Barbados from May 21 to 24, 2024.

HIGHLIGHTS OF THE FORUM:

- More than a thousand participants from across the globe came together to deal with critical challenges like worldwide disruptions, geopolitical conflicts, climate change, and the effects of the COVID-19 pandemic on international trade.
- The assembly included notable individuals, such as trade and transportation ministers from various small island developing states (SIDS), representatives from different UN agencies, representatives from significant harbours, including the Port of Seattle, and leading figures in the shipping and logistics sectors.
- The forum highlighted the challenges and potential in making global shipping more eco-friendly, particularly in renewable-rich developing countries, by advocating for greener fuels, setting safety standards, and improving ports to support sustainable transport.
- The forum's key outcome was launching the manifesto advocating for a major shift in freight transport towards zero-emission fuels, optimised logistics, and sustainable practices to meet climate goals and enhance socio-economic resilience.
- Digital technologies were highlighted as key to enhancing global supply chain resilience. Ministers from SIDS advocated for international financial support and investment in green and sustainable technologies to improve energy efficiency and combat marine pollution.
- The forum's notable accomplishment was introducing the UN Trade and Development Trade-and-Transport Dataset, created with the World Bank. This dataset covers global data on over 100 commodities and transportation methods to offer insights into trade and transport costs.
- The upcoming forum is scheduled to be held in Saudi Arabia in 2026.

ABOUT THE UNITED NATIONS GLOBAL SUPPLY CHAIN FORUM:

The United Nations Global Supply Chain Forum is a key conference convened by the United Nations to enhance the effectiveness, sustainability, and robustness of worldwide supply

chains. It gathers diverse participants, including officials from UN bodies, sovereign states, businesses in the private sector, civil society organisations, and educational institutions. **Here are some key aspects typically addressed in such forums:**

- **Enhancing Collaboration:** Promote cooperation among stakeholders involved in global supply chains to address common challenges and share best practices.
- **Sustainability:** Develop strategies to make supply chains more environmentally sustainable, including reducing carbon footprints and managing waste.
- **Efficiency:** Identify ways to improve the efficiency of supply chain operations, reduce costs, and increase the speed and reliability of deliveries.
- **Resilience:** Build more resilient supply chains capable of withstanding and recovering from disruptions such as natural disasters, pandemics, and geopolitical issues.
- **Innovation:** Encourage the adoption of new technologies and innovative approaches to improve supply chain management.
- **Supply Chain Transparency and Traceability:** Ensuring that products can be tracked through every stage of the supply chain to ensure ethical sourcing and compliance with regulations.
- **Digital Transformation:** Leveraging blockchain, AI, and IoT to enhance supply chain operations.
- **Public-Private Partnerships:** Fostering collaboration between governments and private sector companies to achieve common supply chain goals.
- **Humanitarian Logistics:** Improving supply chains for humanitarian aid and disaster response to ensure timely and effective delivery of assistance.
- **Regulatory Compliance:** Navigating the complex regulatory environments that affect global supply chains.

CONCLUSION:

The forum is crucial for addressing the interconnected nature of global supply chains and ensuring they are equipped to handle current and future challenges. The UN Global Supply Chain Forum is vital in driving forward-thinking solutions and fostering a collaborative approach to global supply chain management by bringing together a diverse group of stakeholders.

MAINS PRACTICE QUESTION:

- Q. Discuss the primary objective of the UN Global Supply Chain Forum. What plans or projects does the UN Global Supply Chain Forum have to further global supply chain sustainability and efficiency?**

[Amit Pradhan](#)