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Glucagon – Like Peptide 1 (GLP 1)

Prelims: *Current events of national and international importance*

Why in News?

Recently, nearly 12% of Americans have used GLP-1 drugs for weight loss, including about one-fifth of women aged 50 to 64, according to a journal report.

- **Glucagon – Like Peptide 1 (GLP 1) –** It is a naturally occurring peptide hormone.
- It is water soluble molecules ranging for a few 200 amino acids in length.
- It is *incretin hormone and a neurotransmitter*.

> ***Incretin hormones*** *are a group of gut hormones that play a crucial role in regulating blood glucose levels after eating.*
>
> ***Neurotransmitter*** *is a chemical messenger that transmits signals between neurons or from neurons to other cells like muscle or gland cells.*

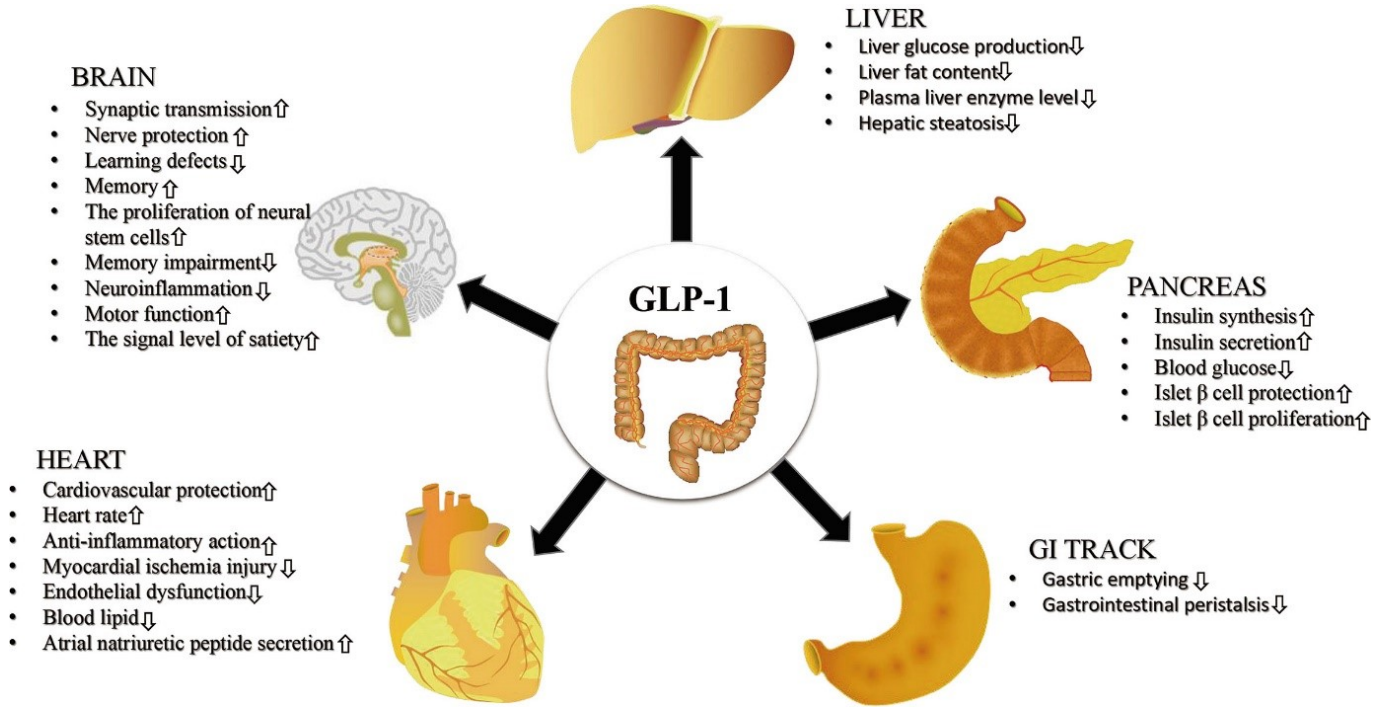
- **Secreted from** – The small intestine and from the hindbrain (regulating vital functions and coordinating movement).
- It is produced in the gut by enteroendocrine L-cells after we eat a meal.
- **Features** – Natural GLP-1 is so short-lived.
- GLP-1 works for just a few minutes, so after you eat a meal and GLP-1 is secreted naturally, it gives an immediate effect that lasts maybe 30 minutes.
- To last longer in the body, GLP-1 is attached to fatty acids, which help the drug stick to

a blood protein (albumin), which carries

- Carries it around the body
- Protects it from being broken down too quickly.

- **Functions** - Travels to the pancreas, where it helps to ***regulate our blood sugar*** by increasing insulin and decreasing glucagon. It helps control body weight.

- GLP-1 *binds to in many organs* in the body, also has beneficial effects in many of these organs, such as the kidney, liver, and cardiovascular system.



- It is chopped up by metabolic enzymes known as *DPP-4* and cleared by the kidneys.

- **Blood glucose-dependent** – The GLP-1 start to act only if the blood glucose is elevated.

- **Impacts** - The brain associated with control of hunger and satisfaction, to effectively tell us that we have had enough to eat and need to stop eating.

References

1. Medicalxpress| GLP-1

2. The Indian Express| Glucagon – Like Peptide 1 (GLP 1)

GLP -1 Receptor Agonists (GLP-1 RA)

Prelims: *Current events of national and international importance*

Why in News?

Recent studies have shown that GLP-1 Receptor Agonists (GLP-1 RA) can be used to treat Alzheimer's and Diabetes.

- **GLP-1 RA –** These are synthetic drugs that *mimic the actions of GLP-1.*
- **Longer lifetime** – By fatty acid acylation that protects GLP-1 from breaking, it's been able to extend that to up to 160 hours.

Fatty acid acylation *is drug molecule attached to a fatty acid, in this case, GLP-1. That will allow the drug to bind to a natural protein called* ***albumin****.*

Albumin is a protein that plays a crucial role in transporting various substances throughout the body, including fatty acids.

- **Feature** – It *solves druggability problem* of GLP-1, by attaching to albumin, that protect the drug from degradation, from being cleared by the kidneys.

Druggability *is the ability of a protein to bind a modulator and produce a desired therapeutic effect.*

- **Availability of GLP-1 RA** –They are available in different forms, including injectable medications and, increasingly, oral formulations.

- **Uses –** Stimulates insulin secretion to lower blood sugar.
    - Manages appetite and weight
    - **Slows gastric emptying** – Contribute to a feeling of fullness and reduce calorie consumption.
    - It may have neuroprotective effects, potentially improves conditions like

Alzheimer's and Parkinson's disease (as per National Institutes of Health)

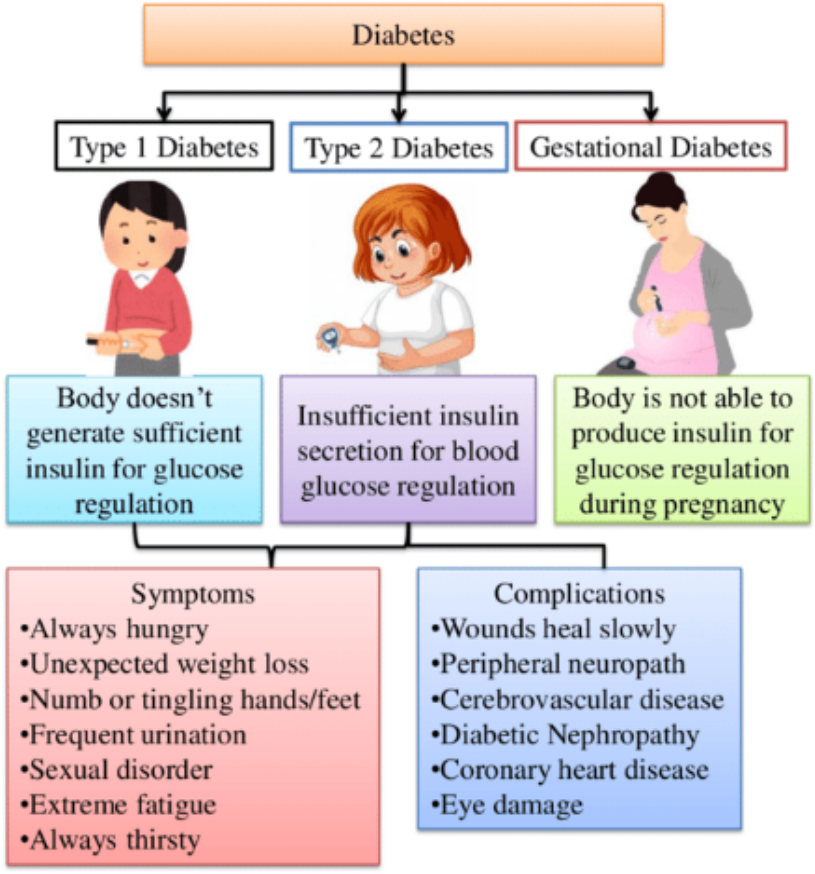
- It reduces overall inflammation in the body

- **Treatment** – Type 2 diabetes and obesity.

Quick facts

Diabetes

•
It is ***chronic disease*** where blood glucose (sugar) levels are too high, either because the body doesn't produce enough insulin, or because the body can't effectively use the insulin it does produce.
•
Treatment - Managing blood sugar levels and preventing complications, with approaches varying based on diabetes type.
•
Lifestyle changes – Like diet and exercise are crucial, alongside medications like insulin (primarily for Type 1) or oral medications (often for Type 2).
•
Monitoring blood sugar, weight management, and stress management also play important roles.



Reference

[The Indian Express| GLP-1 RA]

Narrow-Banded Rain Snake

Prelims – *Current events of National and International Importance | Bio-diversity.*

Why in News?

Recently, Mizoram university and Guwahati based biodiversity conservation group, Help Earth, have recorded a new species of rain snake.

- **Scientific name –** Smithophis leptofasciatus.
    - **Genus –** It is the third species in the genus, Smithophis to have been recorded from the northeastern State
    - **Nomenclature –** Leptofasciatus is a Greek and Latin hybrid, meaning 'narrow-banded', refers the snake's distinctive dorsal markings.
- **Another name –** Ruahrul in Mizoram.
- **Family –** Natricidae.
- **Size –** Small sized snake, reach up to 32 cm.
- **Morphology –** Predominantly shiny dark or black, interspersed with distinct, narrow, creamish-white or yellowish-lime transverse bands, each covering only one or two dorsal scales.



- **Habitat –**Semi-aquatic, close to small streams under leaf litter, and beneath rocks or decaying logs.

- **Distribution –** Tropical wet montane and tropical semi-evergreen forests at elevations ranging from approximately 900–1,200 m in Mizoram, India. Endemic to tropical forest in Mizoram.

- **Behavioural traits -** It is ***nocturnal*** and most commonly spotted during the monsoon season.

- **Reproduction -** A gravid female observed in captivity laid 6 eggs, providing rare reproductive data.

- **Significance -** The new species reinforces Mizoram's importance as a biodiversity hotspot.

References

1. The Hindu| New Species Rain Snake

2. Taprobanica| Smithophis leptofasciatus

Scheme for Conservation, Development and Sustainable Management of Medicinal Plants

Prelims - *Current events of national and international importance | Government policies and interventions.*

Why in News?

Recently, government has approved projects under integrated Component of Scheme for Conservation, Development and Sustainable Management of Medicinal Plants.

- It is a *central sector scheme* that was approved by the cabinet in 2008.
- **Aim** – To provide *project-based support* throughout the country for different activities.
- **Implemented by** - National Medicinal Plants Board (NMPB), Ministry of Ayush.
- **Coverage** – All across India.
- **Support** – Both *financial and technical support* are provided.

Other Government Support for Medicinal Plants	
Mission for Integrated Development of Horticulture (MIDH)	Provide *financial assistance for area expansion* of short duration medicinal plants.
Ministry of Tribal Affairs	It supports *value addition, processing and marketing* of forest and agricultural produce gathered by tribal communities under • PM Janjatiya Vikas Mission (PMJVM) • PM- Janjati Adivasi Nyaya Maha Abhiyan (PM JANMAN) scheme

Mission for Integrated Development of Horticulture *is a Centrally Sponsored Scheme for the holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops, mushrooms, spices.*

National Medicinal Plants Board (NMPB)

• **Set up in** – 2000.
• **Nodal ministry** - Ministry of AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha & Homoeopathy).
• **Aim** - To promote coordination between various ministries, departments and different organizations.
• To enhance overall conservation, cultivation, trade and export growth of medicinal plants sector both at the Central, State & International level.

- Technical support was provided *to farmers including tribal farmers*.
- **Integrated component** – ***Forward and backward linkage in supply chain*** of medicinal plants.
- It includes activities like
  - Infrastructure for Quality Planting Material
  - Information Education Communication (IEC) activities
  - Infrastructure for Post-Harvest Management and Marketing
  - Quality Testing and Certification of raw material
- **Importance** – It provided *local employment* through project activities approved under integrated component.
- It provided *short-term income* especially to women.
- These efforts led to direct income generation and promoted *inclusive economic growth at the grassroots* level.

References

- PIB| Conservation of Medicinal Plants
- NMBP| National Medical Plants Board

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