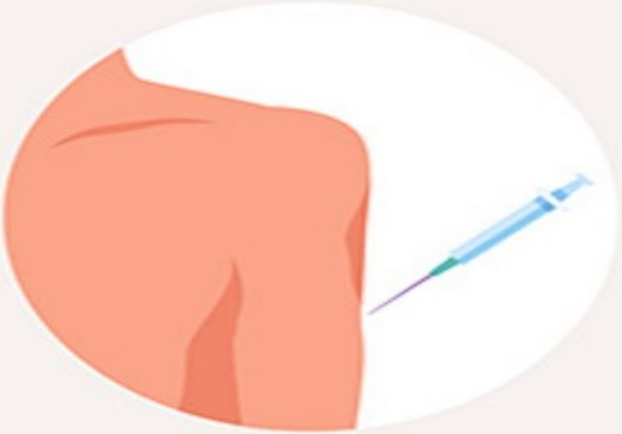
DR.VEERA LOKESH REDDY
MBBS,CMO
NARAYANA HOSPITAL,NELLORE

TREATMENT

Diabetes Medications

Blood Sugar Monitoring

Insulin Pills



Insulin Injections

Increase in blood glucose

↓

Enter beta cells through GLUT receptors

↓

Glucose is metabolized to form ATP

↓

ATP blocks ATP sensitive K^+ channels

↓

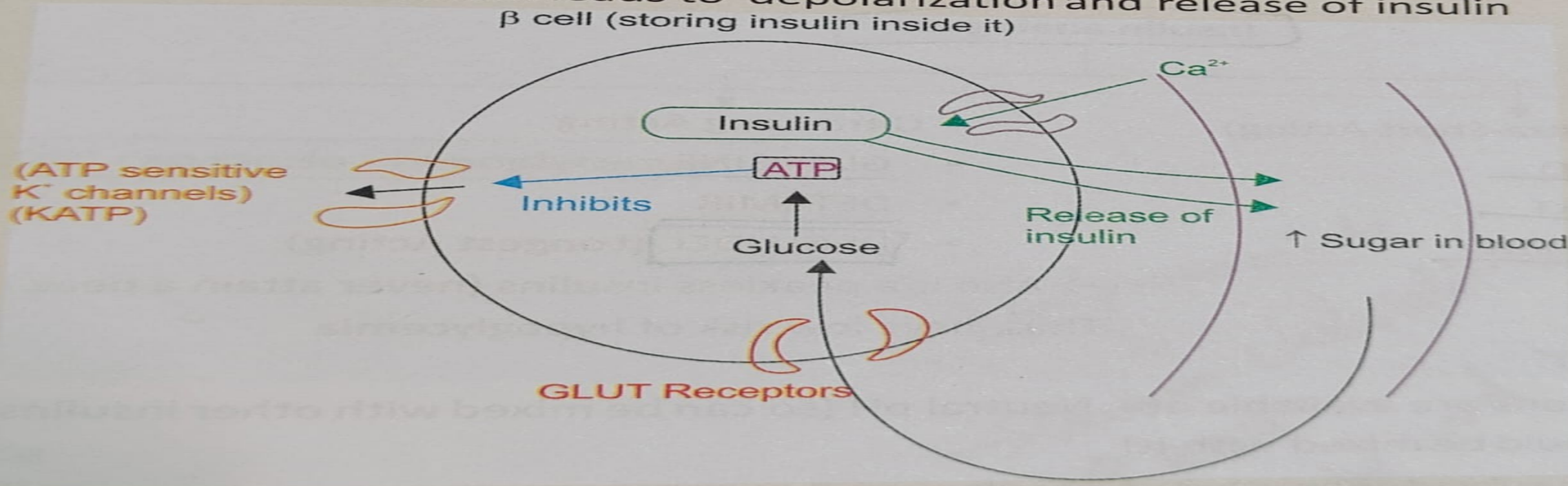
Increased K^+ inside cell leading to slight depolarization

↓

Opening of calcium channels

↓

Influx of calcium leads to depolarization and release of insulin



INSULIN ;

- **INDICATIONS ;**

1. All patients of type 1 DM
2. Uncontrolled patients of type 2 DM
3. Diabetes in pregnancy
4. Diabetic ketoacidosis
5. Acute hyperkalemia

ROUTES OF ADMINISTRATION;

- **SUB-CUTANEOUS ROUTE:**

- MC route (because self-administration is possible with this route)
- All insulin preparations can be given by subcutaneous route.

- **SITE OF ADMINISTRATION**

. Entire abdomen except area around umbilicus(thickness of skin is not uniform, so insulin absorption is affected)

. Anterior thigh

. Lateral thigh

. Arm

. **Intravenous route:**

- Only REGULAR INSULIN can be given
- So, insulin of choice in diabetic ketoacidosis

. **Inhalational route:**

Exubera – withdrawn from market because of pulmonary complications.

#Afreeza – short acting – so should be given before every meal

PREPARATIONS OF INSULIN

- Short acting – Regular, semi-lente
- Intermediate acting – NPH(neutral protamine Hagedorn), lente
- Long acting – ultra lente
- Lente (insulin with Zn combination (70% ultra lente+30% semi lente)
- Zn (Stabilizes the hexameric form of insulin to make it long acting)

INSULIN ANALOGUES

- RAPID ACTING (Ultra short acting)
- Lispro
- Aspart
- Glulisine

*ULTRA LONG ACTING
- Glargine
- Detemir
- Degludec(long acting) – also k/a peakless insulin thus, have low risk of hypoglycemia

SIDE EFFECTS

1.Hypoglycemia

- MC side effect
- Most dangerous S/E
- S/E which can be easily prevented
- Advise to patients for prevention

* Do not skip meals
*Keep glucose

2.Hypokalemia

3. Lipoatrophy (results from repeated injections at the same site)

ORAL ANTIDIABETICS DRUS

Act by increase insulin (insulin secretagogues)

S/E hypoglycemia

>30% functional beta cells should be present

Act by other mechanisms

 # no hypoglycemia

 # no such requirement

1.Insulin secretagogues(act by increasing insulin secretion)

These drugs secrete insulin by inhibiting ATP sensitive K+ channels.

SULFONYLUREAS	MEGLITINIDES
1ST Generations	Nateglinide
Chlorpropamide Tolbutamide	Repaglinide
2nd Generations	
Glipizide Gliclazide Glibenclamide	

- **Sulphonylureas**

- Cause hypoglycemia
- Cause weight gain

. Meglitinides

- Short acting (work for – 1hr)
- Indicated in post prandial hyperglycemia

DRUGS ACTING BY OTHER MECHANISMS

1. AMP kinase stimulators

***Group k/a biguanides**

- Metformin

-Phenformin

*** Biguanides act by activating an enzyme AMP kinase that result in**

- Gluconeogenesis(-)

- Glycogenolysis (-)

- Glycogenesis (+)

- Glycolysis (+)

***These drugs do not release insulin – so do not cause hypoglycemia**

***S/E of biguanides**

- Megaloblastic anemia (more with metformin)

- Lactic acidosis (more with phenformin)

*Biguanides C/I

- liver disease (gluconeogenesis cannot occur)
- renal disease (lactic acid produced cannot be excreted)

- Indications;
  - Metformin is DOC for T2DM
  - No risk of hypoglycemia
  - Max. reduction in HbA1c

  M – metformin preferred in

  O – obese pts

  S – sulfonylureas are preferred in

  T – thin patients
- Can cause weight loss or weight neutral
- Metformin is also indicated for POCD

***GLITAZONES**

- Rosiglitazone
- Pioglitazone

MOA

- Act by stimulating PPAR gamma (reversal of insulin resistance)

ADVERSE EFFECT

- Hepatotoxic
- Rosiglitazone & pioglitazone required LFT monitoring
- Predispose to osteoporotic fractures
- Risk of MI
- Risk of urinary bladder carcinoma by pioglitazone

*Alpha glucosidase inhibitors

- Act by inhibiting the intestinal absorption of carbohydrates

*Drugs

- Acarbose
- Voglibose

*Flatulence –MC side effect

- C/I – Inflammatory bowel disease
  - -UC
  - Crohn's disease

- **INCRETIN**

- Incretins are normal physiological substance which are released in GIT after food intake that stimulate the release of insulin.

- Most important endogenous incretins are GLP (glucose like peptide) & GIP (Glucose stimulated insulinotropic polypeptide)

- **Functions of incretins ;**
  - Increase insulin release
  - Decrease gastric motility
  - stimulate satiety centre of brain

-GLP is metabolized by DPP-4 & becomes inactive

***GLP analogues**

- Exenatide
- Liraglutide
- Semaglutide

***Advantages**

- Cause weight loss
- Do not cause hypoglycemia

***S/E**

- Acute pancreatitis
- Nausea

- **DPP-4 inhibitors:**
  - Sitagliptin
  - Vildagliptin
  - Linagliptin
  - Saxagliptin

***S/E**

- Nasopharyngitis
- Pancreatitis

***C/I**

- Renal failure except linagliptin which is safe

***SGLT-2 inhibitors**

Glucose is freely filtered by glomerulus but the clearance of glucose in urine is negligible.

- Because the reabsorption takes place in PCT by SGLT-2

-SGLT-2 inhibitors stop the reabsorption of glucose in PCT resulting in glucosuria

DRUGS;

-Canagliflozin

-Dapagliflozin

-Empagliflozin

S/E;

-Most common side effect of SGLT-2 inhibitors is Urinary tract infections (urosepsis) & genital tract infections (Fournier's gangrene)

SGLT-2 inhibitors provide cardiovascular benefits thus it has been approved for the treatment of CHF

MANAGING YOUR DIABETES IS NOT A SCIENCE,

IT IS AN ART

Diabetic problems ... instagram

THANK YOU