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DIABETES MELLITUS

DEFINITION

Diabetes mellitus is commonly known as Diabetes. It is a group of metabolic disorder characterised by a high blood glucose levels over a longer period of time.

TYPES

- Type I DM (insulin dependent)
- Type II DM (non-insulin dependent)
- Gestational diabetes (in pregnancy)

EPIDEMIOLOGY

About 10% of the population are affected with diabetes mellitus worldwide.

ETIOLOGY

- Genetic
- Obesity
- Decreased insulin secretion
- Decreased insulin action or insulin resistance

PATHOPHYSIOLOGY

Normally, insulin is secreted by beta cells of islet's of langerhans in pancreas which reduces blood glucose level.

It reduce the blood glucose level by increasing uptake of glucose from blood to the skeletal muscles, liver and adipose tissue. Generally, insulin function is to store energy.

Vascular changes in diabetes mellitus

- Inflammation
- Atherosclerosis

Vascular changes takes place in lumen, endothelium, tunica intima and tunica media. In hyperglycemia, blood with high glucose enters into the endothelial layer. Endothelial Cell release ROS. ROS activates Pkc (protein kinase C).

This PKc has three functions:

It increases vascular endothelial growth factor(VEGF).

This VEGF cause angiogenesis and cellular growth.

PKc then increase endothelial production.

PKc also increase Nuclear factor kappa B (NFkB).

NFkB activates monocytes and LDL in lumen layer.

This increase vascular permeability in endothelial layer.

Due to increased vascular permeability, LDL and monocytes enter into tunica intima from lumen layer. In intima layer, monocytes are converted into macrophages. These macrophages engulf LDL and form foam cells.

This formation of foam cells is responsible for the formation of plaque and vascular changes.

RISK FACTORS

- Family history
- Obesity
- Cardiovascular problems
- Gestational diabetes

COMPLICATIONS

If Diabetes left untreated, it leads to several complications such as

Microvascular

- Retinopathy
- Neuropathy
- Nephropathy

Macrovascular

- Cardiovascular problems
- Peripheral complications

DIAGNOSIS

Estimation of blood glucose level.

Normal:

Fasting blood glucose: <110mg/dl.

2 hr glucose: <140mg/dl.

In diabetes:

Fasting blood glucose: > 126mg/dl.

2 hr glucose: > 200mg/dl.

TREATMENT

Biguanides

- Metformin

Sulfonylureas

- Chlorpropamide
- Tolbutamide
- Glipizide
- Gliclazide
- Glimipride
- Glibenclamide

Meglitinides

- Repaglinide
- Nateglinide

Thiazolidinediones

- Rosiglitazone
- Pioglitazone

Alpha glucoside inhibitors

- Acarbose
- Miglitol

DPP4-inhibitors

- Saxagliptin
- Vildagliptin
- Sitagliptin