



A review on recent trends of diabetes mellitus

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Abstract

Type 2 diabetes mellitus is a chronic metabolic disorder in which has been increasing all over the world. The epidemic nature of diabetes mellitus in different regions is reviewed. Whereas the Middle East and North Africa region has the highest prevalence of diabetes. It highlights a growing epidemic imposing serious social economic crisis to the countries around the globe. This review is based on some trending therapeutic and technological methods and few current trending medications such as newly launched oral drugs and injectable drugs like glyxambi, segluromet, tresiba, ozempic etc. these are helpful to manage your diabetes. Life style plays a crucial role in the management of diabetes. Some major life styles are nutritional diet and exercises etc.

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Introduction

Diabetes is a disease that occurs when your blood glucose (or) Blood sugar is too high. Diabetes mellitus is one of the oldest disease now to man. It was first reported in Egyptian manuscript above 3000 years ago. Type 2 diabetes mellitus was first described as a component of metabolic syndrome in 1988. It is also known as non -insulin dependent Diabetes mellitus. Type2 diabetes mellitus results from interaction between Genetic, environmental and behavioral risk factors. It is a metabolic disorder where in human body doesn't

produce or properly Insulin, a hormone that is required to convert sugar, starch and other food into energy. It is also referred as back-death from the 14th century. In people with diabetes, blood sugar levels remain high .the most common forms of diabetes are type-1 diabetes (5%) which is an autoimmune disorders and Type-2 diabetes (95%) which is associated with obesity it is a serious disease. Glucose fails and blood sugar levels become dangerously low (or) high. Human beings eat food, non-glucose, human food get converted into glucose as a part of the normal digestion process. Once converted, glucose enters the blood stream, causing the level of dissolved glucose inside the blood to rise .the blood stream then carries the dissolved glucose to the various disease and cells of the body. Through glucose may available in the body [1]. The international federation (IDF) estimate the total number diabetes subject to be around 4.9 million in India & to further to set to risk to 69.9 million by the year 2025. Insulin & glucose hormones both are secreted by the pancreas .insulin decrease the blood glucose level by

The gluconeogenesis and transport in the muscle liver & adipose tissue. Basically “diabetic mellitus “is taken from the Greek word diabetes meaning 'siphon - to pass through and the Latin word mellitus meaning “sweet“. A review of the history shows that the term” diabetes“ was first used to Apollonius of Memphis around 250 to 300 bc . Ancient Greek, Indian and Egyptian civilization discovered the sweet nature of urine in this condition mering and minikowski in 1889 discovered rule of the pancreas in the pathogenesis of diabetes Unfortunately even today diabetic is one of the most common chronic disease in the country and worldwide . Diabetes mellitus has several categories, including type 1, type 2, maturity onset diabetes of the Young, gestational, neonatal diabetes and secondary causes due to endocrinopathies steroid use etc. The main sub types of diabetes mellitus are type-1 diabetes and type 2 diabetes [2].

Types of diabetes

The most common type of diabetes are type 1, type 2, and gestational diabetes.

- Type 1 is also known as” diabetes insipidus“.
- Type 2 also known “diabetes mellitus“.

Type-1

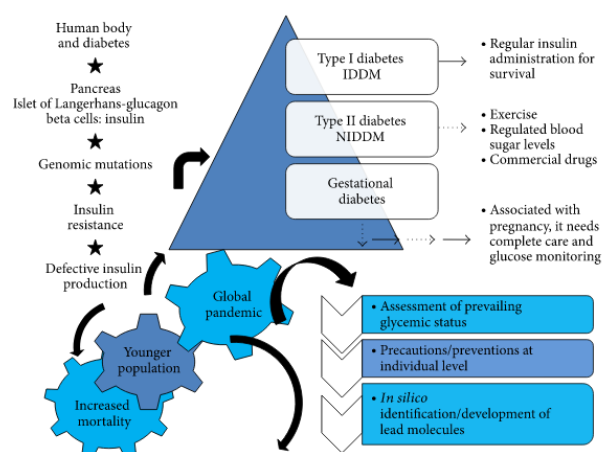
- Type 1 diabetes is also called insulin dependent diabetes. It is used to be called juvenile onset diabetes because it often beings in childhood.
- It happens when your attacks your pancreases with anti-bodies. The organ is damaged and does not make insulin.

Type -2 [1,2]

It is also called as' adults onset diabetes.' If. You have type 2 diabetes, your body does not make or use insulin well. You can develop type 2 diabetes at any age. Even during childhood however this type of diabetes occurs most in middle Aged and older peoples. It is most common type of diabetes.

Gestational diabetes

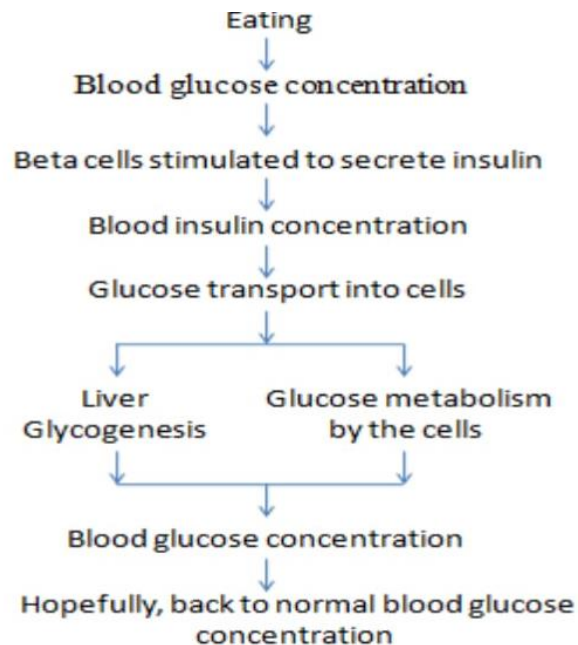
Gestational develops in some women when they are pregnant. Most of the time, this type diabetes goes away after the baby is born. However if you have had gestational diabetes, you have a greater chance of developing type 2diabetes later in life. Some types diabetes diagnosed during pregnancy is actually type 2 diabetes.



Classification

The classification of diabetes as proposed by the American diabetes association (Ada) in 1997 as type 1, type 2, other types and gestational diabetes mellitus. It is still the most accepted classification and adapted by ADA. The first mostly accepted classification of diabetes mellitus was published by WHO in the year1980 and modified year 1985. Wilkin proposed the acceleration hypothesis that argues type -1 and type- 2 diabetes are the same disorder of insulin resistance set against different genetic background [3].

Glucose metabolism flow chart



Globally 1 in 11 adults has DM. The onset of T1DM gradually increases from birth and peaks at ages 4 to 6 years and then again from 10 to 14years approximately 45% of children present before age 10 years. Will must auto immune disease are more [4].

Etiology

The word etiology is derived from Greek word `aetiologia' It includes

It is currently believed that the juvenile onset form has an auto-immune etiology virus may also play a role in etiology of diabetes like.

Coxsackic B

In the islets of Langerhans in the pancreas, there are two main subclasses of endocrine cells .Insulin producing beta cells and glucagon secreting alpha cells. Without the balance between insulin and glucagon, the glucose levels become inappropriately [4].

In case of Diabetes mellitus, insulin is either absent and or has impaired, the result is the absolute destruction of beta cells.T2DM involves a more insipidus onset where an imbalance between sensitivity causes a function deficit of insulin , it is commonly developed from obesity and aging. Monozygotic twins with one affected twin have a 90% likelihood of the other twin developing T2DM in his/her life time. Several endocrinopathies, including Acromegaly, Cushing syndrome, Glucaganoma, Hyperthyroidism, Hyperaldosteronism and Somatostatinomas have been associated with glucose in tolerance and diabetes mellitus.

Epidemiology [5,6]

It is estimated that 366 million people had DM in 2011; by 2030. This would have risen to 552 million.

Type2DM is increasing in every country with 80%. Where the majority of patients are aged between 45and64 years common in females there are no apparent gender differences in the incidence of Childhood T1DM. The onset of T2DM is usually later in life, through obesity in adolescents as led to on increasing in T2DM is younger population. It is predicted that prevalence of DM in adults of which type2DM is becoming prominent will increasing in next 2 decades.

Lifestyle, genetics and medical conditions

Type2DM is due to primarily to lifestyle factors and genetics. Lifestyle factors are known to be important to development of type2DM. Then are physical inactivity, sedentary lifestyle, cigarette smoking and consumption of alcohol. More over obesity is strongly inherited others causes included acromegaly, Cushing syndrome, chronic pancreatitis, cancer and drugs.

Diagnosis test for diabetes

- Random glucose test – 54.4%
- Fasting glucose test -99.2%
- HbA1c test -27.2%

Random glucose test

Glucose testing is random blood test to check glucose (sugar) level. The blood is then wiped onto a test strips that will give a glucose reading .It is a powerful tool for people with Diabetes. Some early symptoms diabetes are excessive urination and thirst.

Fasting glucose test

These measure your blood sugar after an over- night. A fasting blood sugar levels of 99mg/dl or lower is normal, 100-125mg/dl indicates you have pre-diabetes and 126mg/dl or higher indicates u have diabetes .One type of glucose test is called a glucose tolerant test. For this test you will need to fast for 8 hours before [7,8]

Table 01: Tests for Without Diabetes and With Diabetic

Time	Without Diabetes	With Diabetes
Fasting	70-79MG/DL	80-130MG/DL
1-2 HRS After Meals	<140MG/DL	<186MG/DL
ALC Tests	<5.7%	<7%

HbA1C Test

This test is also known as the Haemoglobin A1c or HbA1C test is simple blood test in average blood sugar levels over the past 3 months. It is one of the commonly used test to diagnose pre-diabetes and diabetes.

Trending therapeutic approaches for diabetes

Statin Therapy

A New Perspective Statins are defined as inhibitors of 3-hydroxy-3-methylglutaryl coenzyme A and inhibit the crucial process of LDL cholesterol in liver, thereby decreasing its level in the blood besides increasing healthy blood vessel lining. Since the long term effect of diabetes include the high risk of cardiovascular diseases, statins (HMG-CoA reductase inhibitor) are a main line of therapy in reducing cardiovascular risk in the patients suffering from type 2 diabetes [9]. The lipid lowering agents, popularly known as statins, cause inhibition of HMG-CoA reductase specifically and reversibly. The enzyme catalyzes the conversion of HMG-CoA to mevalonic acid, the rate-limiting step in the formation of cholesterol. These compounds are highly effective in reducing cholesterol levels as compared to dietary supplements. Statin therapy reduces low density lipoprotein (LDL) cholesterol to a significant level thereby greatly decreasing the chances of developing a coronary artery disease. National Institute for Health and Clinical Excellence (NICE) and Scottish Intercollegiate Guidelines Network (SIGN) diabetes guidelines showed lipid lowering therapy as primary prevention (when used regularly) for patients with type 2 diabetes, aged over 40 (Grade A recommendation), as well as its consideration for patients aged over 40 with type 1 diabetes (Grade B recommendation) [10]. A recent information published at the meeting of the European association for the study of diabetes in Stockholm suggests that statin treatment is being less explored and applied in patients with type 2 diabetes among a large American group of over 100,000 subjects Statins have

Good efficacy and are effective in lowering cardiovascular events in people with modest levels of cholesterol and without cardiovascular disease. However, the HMG-CoA reductase inhibitors or statin therapy also has some disadvantages. The therapy has some side effects like renal dysfunction and muscle disorders from myositis to frank rhabdomyolysis and hepatic dysfunction which is rare and can be tolerated by the patient. The trial conducted with 6422 patients showed that young individual and those showing absence of disease showed ineffective or poor compliance with statin therapy. However, the therapy should be focused on older patients since in younger patients the poor compliance was seen. Also, the patients with high risk factors and symptoms of heart problems should be administered with statins. However, reports have suggested that statins may raise the blood sugar levels moderately and lead to diabetes mellitus. Despite exhibiting good toleration and less adverse effects, statins may cause side effects like myopathies and increase in levels of liver enzymes in type 2 diabetes [11].

Stem Cell Technology

A Novel Therapeutic Approach The interest to find a possible therapeutic for diabetes has eventually explored various new scientific areas of research, with the stem cell technology being one of them. It is known that both type 1 and type 2 diabetes result from the β cell deficiency of the pancreatic cells, resulting in insufficient insulin secretion. The strategies should aim at either removing the defects in pancreatic β cell or enhancing the sensitivity of the body cells to the action of insulin. β Cell replacement strategies offer a novel source while current strategies aiming at islet cells and pancreas transplantation are limited due to shortage of donor organs. In contrast to type 1 diabetes, which is caused by autoimmune destruction of pancreatic β cells, type 2 diabetes results from irregularities in β cells function together with insulin resistance in peripheral organs. Mesenchymal stem cell (MSC) therapy has emerged as a promising therapy in the treatment of type 1 diabetes due to its immunosuppressive nature. MSCs have been found to display immunomodulatory effects both in in vitro and in vivo conditions due to direct contact and production of soluble markers [12]. MSCs have the potential to differentiate into a number of mesenchymal cell lineages. The hematopoietic stem cells are the multipotent stem cells that can give rise to all the cell type in blood and also possess immunomodulatory effect. Hence, the transplantation of hematopoietic stem cell has proved to be a promising therapeutic, resulting in improvement in β cell function in newly diagnosed type 1 diabetic patients. Further studies have demonstrated that the induced pluripotent stem (iPS) cells can be generated from type 1 diabetic patients by

Reprogramming their adult fibroblasts with three transcription factors (OCT4, SOX2, and KLF4).

The cells known as diabetes induced pluripotent stem cells; (DiPS) are pluripotent and have the ability to differentiate into insulin producing cells. This is beneficial in type 1 disease modelling and cell replacement therapies. 6 Journal of Diabetes Research Some studies have shown that bone marrow derived MSCs have the ability to differentiate into insulin producing cells both in vitro and in vivo]. The significance of human embryonic stem cells (ESCs) in the treatment of diabetes has attracted great attention due to their pluripotent nature and large scale production of different cell lineages in cultures. The research has various limitations since there is absence of reliable methods for generating specific cell types, immunological rejection of the transplanted cells, and difficulty in purification of specific lineages. Further concerns include the uncontrolled proliferation of the transplanted embryonic stem cells into a specific type, once they are transplanted. Still, despite of its manifold limitations both scientific and ethical, the application of stem cell technology holds immense prospects in treatment of diabetes [13].

Gene Therapy in Diabetes

The series of experiments leading to cloning and expression of insulin in the cultures cells in the 1970s was a tremendous revolution in the field of medicine and application of gene therapy in the treatment of diabetes was suggested as a possible cure. Regulating the sugar levels is the most important aspect in the treatment which also reduces the complications associated with the disease. Somatic gene therapy involving the somatic cells of the body includes two methods of gene delivery. The first one known as ex vivo gene therapy is described as the one in which the tissues are removed from the body; the therapeutic gene is inserted in vitro and then re implanted back in the body while the in vivo therapy involves the insertion of gene therapy vectors directly to the patients by subcutaneous, intravenous, or intra bronchial routes, or by local injection [14]. The application of ex vivo therapy aims at the generation of cells which possess the properties of β cells, for example, insulin producing cells. This therapy has also been used to generate β cells for transplantation. However, the concern lies in the aspect of surgically removing the tissue from the patient and re implantation of the genetically modified tissues back into the body of the patients. Furthermore, type 1 diabetes results from autoimmune destruction of insulin synthesizing pancreatic β cells and islet transplantation has been explored as a possible solution for the treatment. The invention of insulin gene therapy substitutes β cell function by generating insulin secretory non- β cells, not vulnerable to autoimmune reactions, offering a prospective therapeutic approach for type 1 diabetes. The in vivo gene therapy is the method of

Choice as a therapeutic strategy because it is simpler and the vector containing the desired gene is directly inserted into the patient, but the development of safe (not toxic to host) and effective vectors remains as a challenging task for gene therapist. Presently, the strategies for in vivo therapy involve three methods: genetic transfer of glucose lowering genes which are noninsulin in nature [15]. Presently, the strategies for in vivo therapy include genetic transfer of glucose lowering genes which are non-insulin in nature and application of blood sugar lowering genes: an enhancer of glucose utilization by liver or skeletal muscles and an inhibitor of glucose production by the liver. For example, glucokinase as a transgene is found to have glucose lowering effect in the liver. It was a possibility that the gene Gck enhances glucose utilization by the body. The genetic transfer of glucokinase had been used as an adjuvant therapy in the treatment of diabetes. In another strategy which was carried out to regulate the glucose production in liver, a gene known as "protein targeting to glycogen" (PTG) was used to convert glucose to glycogen. The PTG protein belongs to the family of glycogen targeting subunits of protein phosphatase-1 which regulated the metabolism of glycogen. Experiments performed in rats have indicated that adenoviral mediated PTG transfer stimulates glycogen synthesis in the liver and decreases blood glucose levels in rats [1,6]. This has been considered as a therapeutic approach for diabetes. Other areas of genetic engineering include transfer of genes which show response to glucose and the use of gene therapy to induce β cells production in the liver. The glucose responsive genes that have been manipulated to enhance conversion of proinsulin to insulin and those which after modification exhibit expression show responses to blood glucose level. The liver cells do not produce hormones which convert proinsulin to insulin; therefore, new proteolytic cleavage sites have been incorporated into the proinsulin molecule, recognized by a protease, furin that is present in many tissue systems, including liver. The insulin gene can be modified to encode insulin which has single-chain. Having 20–40% activity of normal mature insulin. Research has also been carried out to induce the synthesis of β cells formation in the liver. Kojima et al. reported that it is possible to induce the formation of β cells by the endocrine cells by delivering islets specific transcription factors. The regulation of insulin production and its control remains as a difficult task since the knowledge about insulin metabolism is much less. The strategy aiming at induced β cells neogenesis seems to be a promising approach as a therapeutic for diabetes, since it can offer a solution for the autoimmunity in type 1 diabetes.

Medical Nutrition Therapy

Medical nutrition therapy in prevention and management of diabetes puts forth numerous advances in clinical research, aiming to use nutrition therapy for the treatment of

Disorders and illnesses. American Diabetes Association in 1994 coined the term "medical nutrition therapy" constituting 2 phases, namely, adjudging the nutritional requirement of a person and treatment through counselling and nutrition therapy, respectively. The objectives of nutritional therapy in diabetes is to regulate optimal level of lipids in blood, ideal body weight, and blood glucose level in normal range. Nutrition therapy as a therapy for diabetes depends on certain factors such as patient's age-based nutritive requirements and food preferences as well as other medical conditions together with an exercise regime and recommended nutritional requirement depending upon the patient's abilities and health conditions. Calorie requirement to maintain Journal of Diabetes Research 7 ideal body weight for moderately active individual is 30– 35 kcal/kg/day; for obese people it is 20–30 kcal/kg/day. It is estimated that gradual weight loss of 1 lb per week should occur, if the calorie intake is reduced by 500 calories/day. According to recent recommendations, the percent of carbohydrate intake is based on the patient's intake of protein and fat. Low carbohydrate/high protein diet is popular and may be associated with initial weight loss and improved glycemic control but is difficult to maintain for longer time periods. Protein intake is maintained at 10–20% of all calories; total fat intake should be restricted to 30% of total calories, high fiber diet, sodium restriction to 2400-3000 mg/day, alcohol intake and multivitamins should be taken in diet [16].

Current Trending Medications for Diabetes

In recent years, several new diabetes drugs have been developed. These include oral drugs as well as injectable

New oral drugs

Except for Steglatro, which contains only one drug, the new oral drugs used to treat type 2 diabetes are all combination drugs. They each combine two drugs used on their own to treat type 2 diabetes [15, 16].

These medications are all brand-name drugs that don't have generic forms.

Xigduo XR

Xigduo XR, which comes as a 24-hour extended-release oral tablet, was approved for use in 2014. Xigduo XR combines metformin with dapagliflozin. Metformin helps make body tissues more sensitive to insulin. Dapagliflozin blocks some of the glucose in your system from re-entering your blood through your kidneys. It also causes your body to get rid of more glucose through your urine [17].

Mechanism of Action

Dapagliflozin inhibits the sodium- glucose cotransporter to (SGLT2) which is primarily located tubules of the nephron. SGLT2 facilitates 90% of glucose resorption in

Kidneys and so its inhibition allows for glucose to be excreted in the urine. This excretion allows for better glycaemic control and potentially weight loss in patients with type 2 diabetes mellitus [18].

Side Effects

- Genital yeast infection
- Common cold symptoms like runny or stuffy nose
- Sore throat
- diarrhoea
- Urinary tract infections
- Constipation

Synjardy

Synjardy, which comes as an oral tablet, was approved for use in 2015. It combines the drugs metformin and empagliflozin. Empagliflozin works in a similar way to dapagliflozin.

Mechanism of Action

Synjardy is a combination of empagliflozin, a sodium-glucose over transporter to co-transporter to inhibitor and metformin a biguanide. empagliflozin :sodium glucose co transporter to is the predominant transporter responsible for reabsorption of glucose from the glomerular filtrate back into the circulation empagliflozin reduce renal reabsorbance of filtered glucose and lowers the renal threshold for glucose, there by increases urinary glucoses excretion. metformin hydrochloride :metformin is an antihyper glycaemic agent. Which improves glucose tolerance in patients with type 2 diabetes mellitus, lowering both basal and post prandial plasma glucose. it is not chemically or pharmacologically related to any other classes of oral anti hypo glycaemic agents [19].

Side Effects

- Urinary tract infections
- Female genital mycotic infections
- diarrhoea
- Indigestion
- Headache
- asthenia

Glyxambi

Glyxambi, which also comes as an oral tablet, was approved for use in 2015. It combines the drugs linagliptin and empagliflozin. Linagliptin blocks the breakdown of certain hormones in your body that tell your pancreas to make and release insulin. It also slows your digestion, which slows the release of glucose into your blood.

Mechanism of action

Empagliflozin plus linagliptin therapy combines to medications complimentary mechanism of action: empagliflozin is an SGLT 2 inhibitor. SGLT 2 is a protein that facilitates the reabsorption from the kidney into the blood into the blood.

Side Effects

- Nausea
- Urinary tract infections
- Gas stomach pain
- Weakness

Steglujan

Steglujan, which comes as an oral tablet, was approved in late 2017. It combines ertugliflozin and sitagliptin.

Ertugliflozin works through the same mechanism as empagliflozin. Sitagliptin blocks the breakdown of certain hormones in your body that tell your pancreas to make and release insulin. It also slows your digestion, which slows the absorption of glucose into your blood.

Mechanism of Action

Mechanism of action steglujan combines to antihyperglycemic agent with complementary mechanism of action to improve glycaemic control in patients with type 2 diabetes: ertugliflozin, a SGLT 2 inhibitor and sitagliptin phosphate, a DPP-4 inhibitor.

Side effects

- Headache
- Indigestion
- Weakness
- diarrhoea
- Stomach pain

Segluromet

Segluromet, which comes as an oral tablet, was approved in late 2017. It combines ertugliflozin and metformin.

Mechanism of Action

Mechanism of action segluromet combines two antihyperglycemic agent with complementary mechanism of action to improve glycaemic control in patients with type 2 diabetes: ertugliflozin, a SGLT2 inhibitor and metformin hydrochloride a member of the biguanide class.

Side Effects

1. Abdominal discomfort
2. Indigestion
3. Gas (flatulence)
4. Lack of energy

Steglatro

Steglatro, which comes as an oral tablet, was approved in late 2017. It's a brand-name form of the drug ertugliflozin. It works through the same mechanism as empagliflozin. Like the combination drugs in this list, Steglatro is used to treat type 2 diabetes [20].

Mechanism of Action

Steglatro contains ertugliflozin, sodium glucose cotransporter 2 inhibitor. SGLT2 is responsible for reabsorption of glucose from the glomerular filtrate. ertugliflozin decreases renal reabsorption of filtered glucose by inhibiting SGLT2 and increases glucose excretion

Side Effects

- Vagina itching
- Increased urination
- Thirst
- Weight loss

New injectable Drugs

These new brand-name injectable are not available as generic drugs. They're used to treat either type 2 diabetes, or both type 1 and type 2 diabetes.

These drugs contain a type of insulin, a GLP-1 agonist, or both. The different types of injected insulin act as a replacement for the insulin your body doesn't make or can't use properly. Glucagon-like peptide-1 (GLP-1) receptor agonists help your pancreas release more insulin when your glucose level is high. They also slow down glucose absorption during digestion [5, 22].

Tresiba

Tresiba, which was approved in 2015, is a brand-name version of the drug insulin degludec. It's used to treat both type 1 and type 2 diabetes.

Tresiba is a long-acting insulin that lasts up to 42 hours. This is longer than commonly used insulin. It's injected once daily.

Mechanism of Action

Tresiba contains an active ingredient called insulin degludec which, similar to any other insulin, regulates the glucose metabolism. It reduces the blood glucose levels by stimulating peripheral glucose uptake and controlling hepatic glucose production

Side Effects

- Low blood sugar
- Allergic reactions
- Body fat redistribution
- Swelling
- rash

Basaglar and Toujeo

Basaglar and Toujeo are two new forms of insulin glargine. They're used to treat both type 1 and type 2 diabetes, and are both injected once daily.

Basaglar is a long-acting insulin drug that was approved in 2015. It's similar to another insulin glargine drug called Lantus. Toujeo is a more concentrated form of insulin glargine. It was approved for use in 2015.

Mechanism of Action

Basaglar: - insulin glargine lowers blood glucose by stimulating peripheral glucose uptake and inhibiting hepatic glucose production. Insulin inhibits lipolysis and proteolysis and enhances protein synthesis. basaglar has a duration of action of-24 hours and no pronounced peak

Toujeo:-

Insulin glargine reduces blood glucose by stimulating peripheral glucose uptake and inhibiting hepatic glucose production.

Side Effects

- Anxiety
- Confusion
- Irritable mood

- Fast heart beat
- Muscle cramps

Xultophy

Xultophy was approved in 2016. It's only used to treat type 2 diabetes. Xultophy is injected once per day.

Xultophy combines insulin degludec, a long-acting insulin, and liraglutide, a GLP-1 agonist.

Mechanism of Action

Xultophy 100/3.6 is a combination of insulin degludec, a long acting human insulin analogue, and liraglutide, a glucagon – like peptide1 (GLP-1) Rreceptor agonist. Insulin degludec the primary activity of insulin degludec is the regulation of glucose metabolism.

Side Effects

- Hypoglycaemia
- Runny or stuffy nose
- Headache
- Increased lipase

Soliqua

Soliqua was approved in 2016. It's only used to treat type 2 diabetes. It's injected once per day.Soliqua combines the drug insulin glargine with lixisenatide, a GLP-1 receptor agonist.

Mechanism of Action

Insulin glargine plush lixisenatide 100/33 is a combination of insulin glargine 100 units/ml and lixisenatide 33 mcg/ml. insulin glargine regulates glucose metabolism by simulating peripheral glucose uptake and inhibiting hepatic glucose production.

Side Effects

- Nasopharyngitis
- Upper respiratory tract infection
- headache

Ozempic

Ozempic was approved in late 2017. It's only used to treat type 2 diabetes. Ozempic is a brand-name version of the GLP-1 agonist called semaglutide. It's injected once per week.

Mechanism of Action

Ozempic acts as a GLP-1 receptor agonist that selectively binds to and activates the GLP-1 receptor, the target for native GLP-1. ozempic lowers fasting and post prandial blood glucose by stimulating insulin secretion in a glucose dependent manner.

Side Effects

- Constipation
- Abdominal pain
- diarrhoea

Adlyxin

Adlyxin was approved in 2016. It's only used to treat type 2 diabetes. Adlyxin is a brand-name version of the GLP-1 agonist called lixisenatide. It's injected once daily.

Mechanism of Action

- Adlyxin (lixisenatide) is a once – dialy glucagon – like peptide-1 receptor agonist (GLP- 1RA) GLP-1 is a peptide hormone that is released within minutes after eating a meal. It is known to suppress glucagon secretion from pancreatic alpha cells and stimulate glucose –dependent insulin secretion by pancreatic beta cells. Adlyxin increases glucose – dependent insulin release, decreased glucagon secretion, and slows gastric emptying.

Side Effects

- Dizziness
- Nausea
- vomiting

Ryzodeg

Ryzodeg was approved in 2016 but is not yet available. It's designed to be used to treat both type 1 and type 2 diabetes. Ryzodeg combines insulin degludec with insulin aspart. It's meant to be injected once or twice daily.

Mechanism of Action

Ryzodeg contains a combination of insulin as part and insulin degludec insulin is a hormone that works by lowering levels of glucose in the blood. Insulin as part is a fast-acting insulin.

Side Effects

- Swelling
- Weight gain
- Itching
- Injection site reaction

Lifestyle That Helpful To Control Diabetes [17,24]

1. Eat healthy

This is crucial when you **have** diabetes, because what you eat affects your blood sugar. No foods are strictly off-limits. Focus on eating only as much as your body needs. Get plenty of vegetables, fruits, and whole grains. Choose non-fat dairy and lean meats. Limit foods that are high in sugar and fat. Remember that carbohydrates turn into sugar, so watch your carb intake. Try to keep it about the same from meal to meal. This is even more important if you take insulin or drugs to control your blood sugars.

2. Exercise

If you're not active now, it's time to start. You don't have to join a gym and do cross-training. Just walk, ride a bike, or play active video games. Your goal should be 30 minutes of activity that makes you sweat and breathe a little harder most days of the week. An active lifestyle helps you control your diabetes by bringing down your blood sugar. It also lowers your chances of

Getting heart disease. Plus, it can help you lose extra pounds and ease stress.

3. Stop smoking

Diabetes makes you more likely to have health problems like heart disease, eye disease, stroke, kidney disease, blood vessel disease, nerve damage, and foot problems. If you smoke, your chance of getting these problems is even higher. Smoking also can make it harder to exercise. Talk with your doctor about ways to quit.

4. Manage stress

When you're stressed, your blood sugar levels go up. And when you're anxious, you may not manage your diabetes well. You may forget to exercise, eat right, or take your medicines. Find ways to relieve stress -- through deep breathing, yoga, or hobbies that relax you.

5. Watch your alcohol

It may be easier to control your blood sugar if you don't get too much beer, wine, and liquor. So if you choose to drink, don't overdo it. The American Diabetes Association says that women who drink alcohol should have no more than one drink a day and men should have no more than two. Alcohol can make your blood sugar go too high or too low. Check your blood sugar before you drink, and take steps to avoid low blood sugars. If you use insulin or take drugs for your diabetes, eat when you're drinking. Some drinks -- like wine coolers -- may be higher in carbs, so take this into account when you count carbs.

6. Get check-ups:

See your doctor at least twice a year. Diabetes raises your odds of heart disease. So learn your numbers: cholesterol, blood pressure, and A1C (average blood sugar over 3 months). Get a full eye exam every year. Visit a foot doctor to check for problems like foot ulcers and nerve damage.

Diabetes medications in development

In addition to these new medications, several diabetes drugs are currently in development. These drugs include:

Oral-lyn

These brand name drug comes as fast acting oral incident spray it is designed to treat both type 1 and type 2 diabetes.

Dance 501

This aerosol device contains a liquid insulin that is intended to be inhaled at in time .it is also designed to treat both type 1 and type 2 diabetes

Conclusion

Type 2 diabetes mellitus is a metabolic disease that can be prevented and managed by through lifestyle modification , diet and control of overweight and obesity .this review is mainly focuses on recent trending medications , new oral drugs and new injectable which helpful to manage diabetes.

Diabetes mellitus is a serious complication in today life. The lifestyle and day today circumstances are play major role in Occurring this type of serious complications. In this review we get some idea regarding diabetes mellitus.

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