

Predicts Diagnosis of Diabetics Applying Data Mining Approaches and Techniques

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Abstract -Diabetes is a disease in which levels of blood glucose, also called blood sugar, are above normal. People with diabetes have problems converting food to energy. Normally, after a meal, the body breaks food down into glucose, which the blood carries to cells throughout the body. Cells use insulin, a hormone made in the pancreas, to help them convert blood glucose into energy. In this paper, the basic problems for the patient who are all suffer from diabetics that is to be analyzed and find out what are all solution to overcome for that problems and also studied about the types of diabetes and find out what are symposium occurs and how to overcome that .problem to be analyzed . And also Find out what are all the test conducted for the diabetic period and take the correct diagnosis based on their report. This paper basically studied how to prevent the diabetic period.

Keywords - Diabetes, glucose, insulin and diagnosis

1. DIABETES OVERVIEW

Diabetes mellitus (DM) is a set of related diseases in which the body cannot regulate the amount of sugar (specifically, glucose) in the blood.

Glucose in the blood gives you energy to perform daily activities, walk briskly, run for a bus, ride your bike, take an aerobic exercise class, and perform your day-to-day chores.

In a healthy person, the blood glucose level is regulated by several hormones, including insulin. Insulin is produced by the pancreas, a small organ between the stomach and liver. The pancreas secretes other important enzymes that help to digest food.

Insulin allows glucose to move from the blood into liver, muscle, and fat cells, where it is used for fuel.

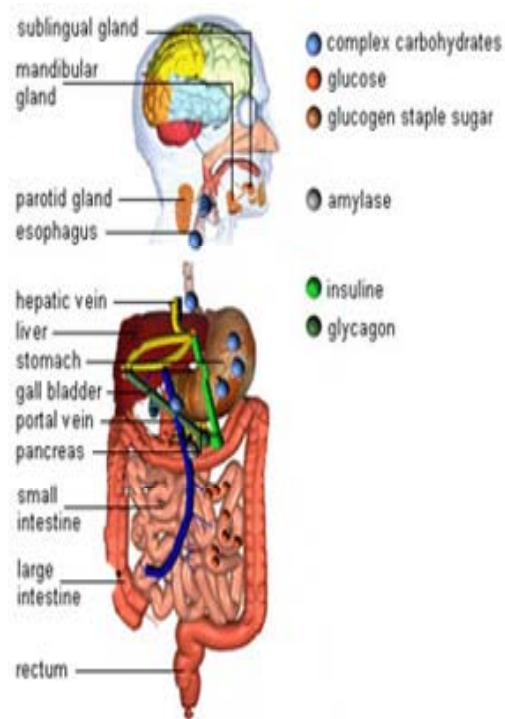
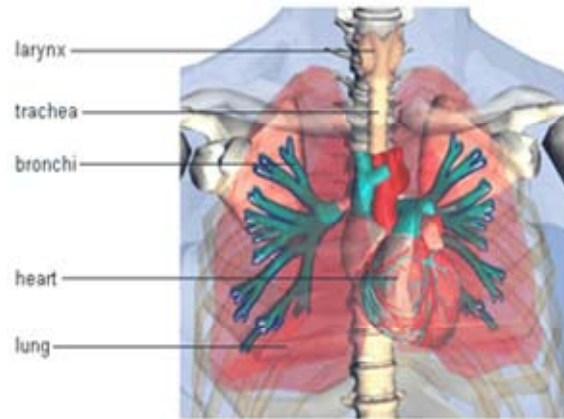


Fig. 1. Functions of Body

1.1 Causes of Diabetes

Hereditary and genetics factors, Infections caused by viruses, Stress, Obesity, Increased cholesterol level, High carbohydrate diet, Nutritional deficiency, Excess intake of oil and sugar No physical exercise, Overeating, Tension and worries, High blood pressure, Insulin deficiency, Insulin resistance.

2. TYPES OF DIABETES

- Type 1 Diabetes
- Type 2 Diabetes
- Gestational Diabetes
- Juvenile Diabetes
- Diabetes Insipidus
- Feline Diabetes

3 TYPE 1 DIABETES

The body stops producing insulin or produces too little insulin to regulate blood glucose level. Type 1 diabetes is typically recognized in childhood or adolescence. It used to be known as juvenile-onset diabetes or insulin-dependent diabetes mellitus.

Type 1 diabetes can occur in an older individual due to destruction of pancreas by alcohol, disease, or removal by surgery. It also results from progressive failure of the pancreatic beta cells, which produce insulin.

3.1 Symptoms Type 1 diabetes takes only a few weeks to develop. The initial symptoms are: increased production of urine (because the body tries to get rid of the excess glucose in the urine, diluting it with water), excessive thirst, fatigue (because the glucose is not being converted into energy), loss of weight, increased appetite, feeling sick, blurred vision, infections such as thrush or irritation of the genitals.

3.2 Treatment

Long-Term Complications Find out what you should know about the long-term complications of type 1 diabetes and what you can do to prevent these problems down the road.

Transplantation Procedures Advances in organ and cell transplantation are showing some success for the type 1 diabetic.

If type 1 diabetes is not treated at this stage, the body begins to produce chemicals called ketones that build up in the blood. This condition ? diabetic ketoacidosis ? causes additional symptoms: vomiting, stomach pain, rapid breathing, increased pulse rate, sleepiness. Without treatment, diabetic ketoacidosis can lead to coma or death.

3.3 Signs and tests

The following tests can be used to diagnose diabetes: urinalysis shows glucose and ketone bodies in the urine, but a blood test is required for diagnosis , fasting blood glucose is 126 mg/dL or higher , random (nonfasting) blood glucose exceeds 200 mg/dL (this must be confirmed with a fasting test) , insulin test (low or undetectable level of insulin)

C-peptide test (low or undetectable level of the protein, C-peptide, a by-product of insulin production)

3.4 Diet

Carbohydrate foods have the greatest effect on blood glucose levels and it is the starchy foods - bread, cereals, potatoes, pasta, rice etc. - that you will need to pay most attention to you. Eat a healthy and nutritious diet, Aim to eat relatively consistent amounts from day to day, Use food labels ,Use the Glycaemic Index ,Consider the potential effects of fat and protein in your diet , Use blood glucose monitoring to assess the effects of different food types on your post-meal (2 hr) blood glucose levels (e.g. compare whole wheat varieties of bread, rice and pasta with their white counterparts) , Know when your insulin's act and consider the time that you eat with respect to the time that you inject your insulin Use a calorie counter, or similar book, to assess the carbohydrate, fat and protein content of foods

3.5 Type 1 Diabetes Cure

In response to the growing health burden of diabetes mellitus (diabetes), the diabetes community has three choices: prevent diabetes; cure diabetes; and take better care of people with diabetes to prevent devastating complications. Both the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC) are involved in prevention activities. The NIH is involved in research to cure both type 1 and type 2 diabetes, especially type 1. CDC focuses most of its programs on being sure that the proven science is put into daily practice for people with diabetes. Several approaches to "cure" diabetes are being pursued: Pancreas transplantation ,

Islet cell transplantation (islet cells produce insulin) , Artificial pancreas development ,

Genetic manipulation (fat or muscle cells that don't normally make insulin have a human insulin gene inserted ? then these "pseudo" islet cells are transplanted into people with type 1 diabetes). Each of these approaches still has a lot of challenges, such as preventing immune rejection; finding an adequate number of insulin cells; keeping cells alive; and others. But progress is being made in all areas.

3.6 Preventing type 1 diabetes

People with type 1 diabetes can help prevent or delay the development of complications such as eye, kidney, heart, blood vessel, and nerve diseases by keeping their blood sugar near normal levels. They also need regular medical checkups to detect early signs of complications. If complications are treated early, the damage may be stopped, slowed, or possibly reversed. People who have other health problems along with diabetes, such as high blood pressure or high cholesterol, need to treat those conditions. Also, not smoking can reduce the risk of complications. Having other health problems can increase the risk for complications from diabetes.

4. TYPE 2 DIABETES

The pancreas secretes insulin, but the body is partially or completely unable to use the insulin. This is sometimes referred to as insulin resistance. The body tries to overcome this resistance by secreting more and more insulin. People with insulin resistance develop type 2 diabetes when they do not continue to secrete enough insulin to cope with the higher demands.

4.1 Symptoms

Up to two-thirds of people with type 2 diabetes have no symptoms. If present, the most common ones are: increased production of urine, unusual thirst, tiredness, loss of weight, increased appetite, feeling sick, blurred vision, infections such as thrush or irritation of the genitals. Some people simply feel a bit unwell or assume they are just ageing.

4.2 Signs and tests

Type 2 diabetes is diagnosed with the following blood tests: **Fasting blood glucose level** -- diabetes is diagnosed if higher than 126 mg/dL on two occasions. **Random (non-fasting) blood glucose level** -- diabetes is suspected if higher than 200 mg/dL and accompanied by the classic symptoms of increased thirst, urination, and fatigue. (This test must be confirmed with a fasting blood glucose test.) . **Oral glucose tolerance test** -- diabetes is diagnosed if glucose level is higher than 200 mg/dL after 2 hours.

4.2 Treatment

Treat all conditions that place the patients at risk for heart disease and stroke, which are the major killers of people with type 2 diabetes. Control blood glucose levels. The goal is to achieve fasting blood glucose levels of less than 110 mg/dL and glycated hemoglobin (HbA1c) levels of less than 7%. The objective is to reduce complications in small blood vessels and the nerve damage associated with diabetes.

The first goals are to eliminate the symptoms and stabilize your blood glucose levels. The ongoing goals are to prevent long-term complications and prolong your life. The primary treatment for type 2 diabetes is exercise and diet.

4.3 Preventing type 2 diabetes

Even small changes can make a difference, and it is never too late to start making healthier choices.

Maintain a healthy weight, Exercise regularly, Eat healthy foods, Eat a balanced diet, including whole grains, lean meat, and vegetables, Limit saturated fats., Limit alcohol., Limit calories in order to avoid gaining weight, or to help you lose weight, Reduce your intake of soft drinks, sugary foods, and junk food. Eat smaller meals more often in order to keep blood sugar levels within your target range.

5. Gestational diabetes is a form of diabetes that occurs during the second half of pregnancy. Although gestational diabetes typically goes away after delivery of the baby. Women who have gestational diabetes are more likely than other women to develop type 2 diabetes later in life. Women with gestational diabetes are more likely to have large babies.

5.1 Symptoms

Increased thirst, Increased urination, Weight loss in spite of increased appetite, Fatigue,

Nausea and vomiting, Frequent infections including those of the bladder, vagina, and skin Blurred vision

5.2 Signs and tests

An oral glucose tolerance test between the 24th and 28th weeks of pregnancy is the main test for gestational diabetes. Finding out that you have gestational diabetes can be scary. It can be reassuring to know that most women who have gestational diabetes give birth to healthy babies and that you are the most important person in promoting a healthy pregnancy.

5.3 Treatment

Treatment for gestational diabetes involves making healthy choices. Most women who make changes in the way that they eat and how often they exercise are able to keep their blood sugar level within a target range. Controlling your blood sugar is the key to preventing problems during pregnancy or birth. You do not need to eat strange or special foods. But you may need to change what, when, and how much you eat. You also do not need to start a fancy exercise program or join an expensive gym. Walking several times a week can really help your blood sugar.

5.4 During pregnancy

Treatment for gestational diabetes during pregnancy includes: Eating a balanced diet, Getting regular exercise, Checking blood sugar levels, Monitoring fetal growth and well-being, Getting regular medical checkups, Taking insulin shots.

5.5 Preventing Gestational diabetes

There are no guarantees when it comes to preventing gestational diabetes — but the more healthy habits you can adopt before pregnancy, the better. Eat healthy foods, Get more physical activity, Lose excess pounds

6. JUVENILE DIABETES

It is an autoimmune disorder which can be due to environmental trigger or virus, which hampers the function of beta cell. Once the beta cells are destroyed the body is unable to produce insulin. It is also believed that Type 1 **diabetes** results from an infectious or toxic insult to a child, whose immune system is predisposed to develop an aggressive autoimmune response either against molecules of the B cell or against altered pancreatic B antigens, resembling a viral protein. A child with **diabetic siblings** is more prone to develop juvenile diabetes than the child from a totally unaffected family. It is considered to be a more hereditary problem than excess eating or being obese.

6.1 Symptoms

The process that destroys the insulin-producing beta cells can be a long and insidious one. At the point when insulin production bottoms out, however, type 1 diabetes usually appears suddenly and progresses quickly. Warning signs of type 1 diabetes include: Frequent urination, Unusual thirst, Extreme hunger. Sudden, sometimes dramatic, weight loss. Weakness, Extreme fatigue, Blurred vision or other changes in eyesight, Irritability. Nausea and vomiting

6.2 Treatment

Diet is also used along with insulin to treat diabetes. This doesn't mean a diet to lose weight like the ones you see advertised on TV. It means eating healthy foods and not going overboard with sweets. Kids with diabetes need to think about what they eat because the sugar in food affects the levels of sugar in the blood.

7. Diabetes insipidus (DI) is a condition characterized by excessive thirst and excretion of large amounts of severely diluted urine, with reduction of fluid intake having no effect on the latter. There are several different types of DI, each with a different cause. The most common type in humans is neurogenic DI, caused by a deficiency of arginine vasopressin (AVP), also known as antidiuretic hormone (ADH).

The second common type of DI is nephrogenic diabetes insipidus, which is caused by an insensitivity of the kidneys to ADH. It can also be an iatrogenic artifact of drug use.

Nephrogenic diabetes insipidus; Acquired nephrogenic diabetes insipidus;

Nephrogenic diabetes insipidus is a disorder characterized by the passage of large volumes of urine due to a defect of the kidney tubules.

Causes, incidence, and risk factors

Antidiuretic hormone (ADH; vasopressin) is a hormone produced in the hypothalamus of the brain. It concentrates the urine by triggering the kidneys to reabsorb water into the blood stream rather than excreting water into the urine. Nephrogenic diabetes insipidus involves a defect in the kidney tubules (the portion of the kidneys that causes water to be excreted or reabsorbed). The specific kidney defect is usually a partial or complete failure of special receptors located on or within the kidney tubules to respond to ADH, the hormone that transmits the instruction to concentrate the urine to the inside of the cells. Excessive amounts of water are excreted with the urine, producing a large quantity of very dilute urine. There is little or no response to vasopressin, even though the blood level of this hormone is higher than normal. If thirst mechanisms are normal and adequate fluids are consumed, there are no significant effects on the fluid and/or electrolyte balance of the body. If inadequate fluids are consumed, the high urine output may cause dehydration and high blood sodium. Most commonly, nephrogenic diabetes insipidus is an acquired disorder. Precipitating factors include drugs (lithium, demeclocycline, amphotericin B), electrolyte disorders (high calcium or low potassium levels), and urinary obstruction.

Symptoms

Excessive thirst (may be intense or uncontrollable, with a craving for ice water),

Excessive urine volume (may exceed 3 to 15 liters per day), Inadequate fluid consumption can result in: Dehydration (Dry skin, Dry mucous membranes, Sunken appearance to eyes). Sunken fontanel's (soft spot) in infants: Fatigue, lethargy, Headache Irritability, Low body temperature, Muscle pains, Rapid heart rate and Weight loss

Feline Diabetes

Diabetes is among the major diseases affecting cats. **Diabetes mellitus** also known as "sugar" diabetes is a condition where the cat's body does not produce or does not effectively produce insulin. Although this can

affect cats of any age, older and obese, especially male cats are more prone to Diabetes.

Pre-diabetes is a common condition related to diabetes. In people with pre-diabetes, the blood sugar level is higher than normal but not high enough to be considered diabetic.

Pre-diabetes increases your risk of developing type 2 diabetes and of heart disease or stroke.

Pre-diabetes can typically be reversed without insulin or medication by losing a modest amount of weight and increasing your physical activity. This weight loss can prevent, or at least delay, the onset of type 2 diabetes.

8 . CONCLUSION AND FUTURE ENHANCEMENT

The body requires the presence of insulin hormone to move glucose, from blood, into the cells. People

affected with diabetes have little or no insulin production in their body. The glucose that builds up in the blood passes out of the body in the form of urine. Thus, the body loses its main source of fuel even though it contains large amounts of glucose. This condition is termed as diabetes. This paper we share some of the ideas about basic problem of diabetes , studied types of diabetes, Symptoms ,signs and test, diet . treatment In future take particular type of diabetes in detailed studied and will find out the result of the studies.

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