DEVELOPING AN APP FOR DIAGNOSIS OF DIABETES FOR MOBILE BASED SYSTEM USING KNOWLEDGE BASE

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Abstract

Aim: To develop an App for diagnosing diabetes using Mobile and giving awareness to the people in rural area and saving them from going to chronic stage.

Materials and Methods: user Agent will have user-id and password which will be associated with the user knowledge base, to check if the patient is new patient or old patient, this will be identified with the help of username and password, if he is a new patient he will not have username and password he has to register freshly, as new user is taken care by the knowledge base. In case he happens to be a old patient he will be identified by his existing username and password and will be linked to the patient agent.

Results: Clinical examination for 24 hrs water balance and urine volume, report will be provided. Water Deprivation Test (for upto 7 hrs) will be delivered, and Desmopression challenge test will be predicted. Later categorization of Type-I and Type-II Diagnostic result, gestational and chronic stage will also be told.

Conclusion: This app is very beneficial to the doctor to diagnose the patient from remote and treat the rural people at remote. The rural people are benefited by getting consultation and treatment with the same doctor of their choice without wasting their travel time, as well as illness remains in control.

Introduction

This project is developed using agents each agent is associated with knowledge Base. Clinical Examination, history, signs and Symptoms are taken into account to diagnose seriousness of the disease. Blood and Urine examination are done water operation tests are analyzed. Desemopression challenge test analyses are also done.

Materials and methods

As India is a poor country covering more of rural area, Traversing is a problem so many people are not aware of the disease and go to the hospital when the intensity of the disease is severe, so this problem can be overcome by the rural people as everyone are using mobile they can identify the symptoms of severity and approach the doctor thereafter too, once he finishes the check-up at prelim state he can get the benefit of approaching the same doctor of his wish.

i. Patient Agent: Patient agent with the help of user knowledge base connects to the doctor agent.

ii. Doctor Agent: Doctor agent will also have user name and password to check if the patient belongs to that particular specialist or not and also the knowledge base identifies if the patient is a new patient or an old patient. The doctor knowledge base comprises of series of symptoms for diagnosing the stage or level of seriousness, the patient is undergoing, what treatment the patient must be given.

For Example: Doctor knowledge Base can consist of Type I, Type II, and Gestational and Chronic stage.

If Type I: it could be newly diagnosed adult or it could be newly diagnosed child.

If Type II: it could be newly diagnosed living with Type II diabetes.
If gestational diabetes: it could be dragonised that occurrence takes place at pregnancy and get resolved after child birth so if you see each one of this will again be associated with knowledge base separately. These knowledge base will be provided with treatment, food to be taken and Exercises to be undergone.

Knowledge base study for the diabetes analysis

Flowchart for diabetes analysis
Fig 1 Symptoms of diabetes: the common symptom of diabetes is excessive thirst, frequent urination, intense hunger, gaining of weight, unusual weight loss, increased fatigue, irritability, blurred vision, cuts and bruises take longer time to heal, itchy skin, frequent gum disease/infection, sexual disfunctioning among men, numbness in your feet and hands.

Fig 2 diabetes affecting various organs of the body

Fig 3 Prediabetes: this is diabetes without sign or symptoms blood sugar level is higher than normal. It is possible to avoid prediabetes by eating healthy food, losing weight and staying at a healthy weight, and being physically active can help you bring your blood sugar level back to the normal range.

Simple ways to fight prediabetes

- Increase physical activities
- Aerobic activities
- Sleep well
- Have whole grains in your diet
Fig 4 shows the symptoms in young children and teenager

- They feel very thirsty
- Frequent urination
- Very tired
- Goes very thinner

Fig 5: it is depending on insulin it is dependent diabetes it begins in childhood, it is an autoimmune condition. The immune system is not identified correctly and in turn attacks pancreatic cells that produce insulin, little insulin or no insulin at all.

Results

Different stages of diabetes Type I:

Causes: beta cells in pancreas are attacked by body’s own immune system insulin not produced or produced insufficient.

Genetic basis: this could be due to inheritance risk factor from both parents

Body effects: attack due to beta cells autoimmune attack may occur following viral infection such as mumps, rubella, and cytomegalovirus

Climate: occurs due to cold weather. It occurs more in winter than in summer common in places with cold climate.

Diet: type1 is less common in people who were breast fed and in those who first ate solid food at later ages.

Best diet for type 1 diabetes:

*Timing in meal is very important, in terms of glycermic control and in relation to the effect of insulin injection.

* needs balanced diet including variety of fruits and vegetables, whole grains low fat dairy products, skinless poultry & fish, nuts and legumes and non-tropical vegetable oils.
Fig 5: type II Diabetes is non-insulin dependent and it is adult onset it is common in children

Different stages in diabetes type II:
Monogenic diabetes is increasingly being recognised among those with clinical features of type 1 or type 2 diabetes as genetic studies become available, but population-based data on incidence and prevalence show wide variation due to lack of standardisation in the studies. Similarly, studies on type 2 diabetes in childhood suggest increased incidence and prevalence in many countries, especially in Indigenous peoples and ethnic minorities, but detailed population-based studies remain limited. [1]

Causes: higher take of dietary sugar receptor cells become less sensitive to insulin or not able to remove glucose from the body, which leads to high blood sugar.

Genetic basis: this strongly linked with family history and lineage than type 1
Body effects: occurs due to aging, inactive life style, diet, genetic influence and obesity.
Climate: common in people with low level of vitamin D.

Diet: diets high in simple sugars and low in fibre and low in vital nutrients are likely to lead the diabetes.
Type II diabetes and HBA1C Test:

**HBA1C Test** is done by doctor to measure the glucose level of the patient for past 60 to 90 days unlike other test the low score must be shown to say the patient is in safe zone.

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<tr>
<td>5.4</td>
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</tbody>
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A result of 6.5 and higher means you have Diabetes. 5.7 to 6.4 give you a Prediabetes result, which is a warning to you that if you don’t do something, Type 2 Diabetes is most likely in your future.

Get used to having the HBA1C test. Chances are you will have one every six months or once a year – at least. These are the gold standard for how you are controlling your Diabetes. 7.0 or under means you have it under tight control and will probably not have any complications, or if you do they will be fewer and less severe.
Microvascular complications those resulting from damage to small blood vessels are the most common complications of diabetes.

Complication caused by diabetes:
- Microvascular complication – they damage small blood vessel
  - Retinopathy: disease of the eye
  - Nephropathy: disease of kidney
  - Neuropathy: disease of nerves
- Macrovascular complication – they damage large blood vessels
  - Angina petoris: heart attack
  - Transient attacks and stroke

Peripheral arterial disease
Discussions
Since mobile is used by everyone the patient himself can identify, at the very prelim state taking into account of all the symptoms that he is affected by diabetes and he approaches the doctor. The rural people can get the medication details of his doctor specialist alone, since the knowledge base provides with particular specialists medication and diet. If he is already registered patient under that particular doctor he gets satisfaction of getting consultation with the same doctor always with whom he was observed. The patient illness could be kept under control as he is able to seek the assistance of the doctor from source at the correct time. Visiting the hospital due to lack of time can be overcome as he is able to get assistance from mobile at the source. He can also check the blood sugar level from home using the appropriate apparatus meant for that and if he finds the level of sugar is exceeding above normal at that state he can go for consultation with the doctor...

Conclusion
This app is very beneficial to the doctor to diagnose the patient from remote and treat the rural people at remote. The rural people are benefited by getting consultation and treatment with the same doctor of their choice without wasting their travel time, as well as illness remains in control. India is a country with more rural area and hence traversing is a problem so by introducing this app the doctor as well as the rural people is benefited. The doctor gets the privilege of looking into more patients with more satisfaction, since he already has the history of the patient so he can take his own time in diagnosing more patients easily and effectively.

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