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Cancer Design of an Expert System for Diagnosis of Oral Cancer

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ABSTRACT

Expert systems has designed for the non-specialist people with the aim of make available of skills of specialist people. these plans simulation of through pattern and the method of human performance, and make a relationship between an expert system's function and human performance or a specialist person. Up to now different expert systems has provided in medical science ground and of this regard, it's one of the pioneer sciences. Promptitude has effect diagnose and cure of oral cancer and recovery of patient condition, but sometimes access to specialist is not available for patients. so design of a system with the knowledge of specialist provides an appropriate diagnosis to sick.
Method: This research provides an expert system for diagnosis of oral cancer, using C# and necessary knowledge for diagnose for diagnosis reserves in the form of rules in knowledge unit of system. system with due attention to user's answers shows the probability of cancer.
Finding: Using intelligent software, if there are no expertise , we can diagnose and show the way of treatment, to the reliable extent.
Resulting: The use of intelligent and half-intelligent of systems such as expert systems, can provides for users in the form of companion's decision. However at present it can replace of expertise , by no means.
KEYWORDS: An expert system. Oral cancer. Diagnosis of disease. Pro-type

1. INTRODUCTION

Developing the information technology the decision making systems or in total the decision making based on computer has become important. In this regard expert systems have a basic role as one of ascribe parts to artificial intelligence in expert system all kinds of decision has adopted with computer. Expert systems are on the basis of knowledge and in fact, they are the most important part of them. In this systems, knowledge moved from expertise of any science to computer. Use of expertise systems due to dendral has been admitted to medical word, in 1965. The express and details of molecular structure plan has provided. In 1976,sofware has shown for diagnosis of mycin disease for PUFF's cordial some software are: Xbone software for diagnosis of pulmonary disease, software for diagnose of bone disease software for control sicks that need intensive care, VM for diagnosis of codcuceus disease and blue box, related to internal medicine, treatment of depression, expert systems for diagnosis of electrolyte and acid materials, training for depression, expert systems for diagnosis of electrolyte and acid materials, training for management of unconscious, diagnose of diseases related to internal medicine. The purpose of this research is provide an expert system for diagnosis of oral cancer. then the statement of problem has studies and after shown subjects about oral cancer, the build of system's steps and it's component has state and finally the steps of designed system has describe with applied example. The expert medical system is a computer plan that when it was appropriately, provides effective helps in decision making about diseases and suggestion about way of treatment. This information, usually is transfer from patient to doctor. The expert systems have some features that distinct them from other modual softwares. One aspect of this distinction is these systems imitate from reasons of expertise for access to complete results. In most cases specialists are aware of these consecution reasons. The expert systems need same of rules and pacts of medical science about disease and condition of them in order to provide exact results. Oral cancer starts in mouth. It contains lips, interior part of lips, cheeks, teeth, gums, most part of tongue, boney palate. Oral cancer can contagion to oropharynx that is part of throat and is located on the back of the mouth. When oral cancer come in to existence in this part, it's called oropharyngeal and include back of the tongue, back of the palate, tonsils, upper wall of throat. Mouth and oropharynx are keys that help to healthy function of body. These parts help to breathing, eating, speaking. Salivary glands that are main part of food digestions system, begin to chew the food. Cancer can come into existence in every part of mouth. Oral cancer contains extend section of all kinds of cancer that has treated with various ways, because every section of mouth is deferent with another section. All kinds of cancer: There are some oral cancers that exist in mouth.

Squamous cell cancer: More than 90 % of cancers happen in mouth that are oropharynx, squamous cell cancer. Throat and mouth cover with cells so called squamous that have flat surface. Squamous cell cancer means that some cells are abnormal. Wart cancer: About 5 % of mouth cancer are wart cancers that grow very slow that has established with wart cells.

This oral cancer contagion to another parts of body, rarely, but can invade to around tissues of its main area. Salivary gland cancer: This group consists of some kinds of oral cancer that come to existence in salivary glands and are in whole walls of mouth and throat. Adenoid cystic, mucoepidermoid, adenocarcinoma are examples of this group that have some metamorphosis with low degree. lymphatic cancer: when oral cancer happens in lymphatic tissues that is part of immunity system is called lymphatic cancer. Tonsils include lymphatic tissues.

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Benign cancers of mouth and oropharyngeal cancer: There are some kinds of non-cancer and quasi-tumor that can happen in mouth and oropharynx. Sometimes these conditions lead to cancer. So benign tumors that don't happen again, have been removed with surgery.

Infection factors to oral cancer. Everyone can suffer from oral cancer but some factors increase it. There are some factors that has confirmed playoral in cancer:

Sexuality: oral cancer among men are twice than women. This difference may related to alcohol and drugs, one leading factor that is more common among men rather than women; However, this difference is decreasing follow increasingly use of alcohol and cigar among women.

Age: Average age for recognition of cancer is 62. Two third of people are more than 55- year-old.

Use of tobacco: About 80 % of people who have oral cancer, use tobacco in form of cigar, chewing, snuff. Suffering from cancer depends on duration and numbers use of drugs. Smoking can lead to cheek, gums, interior part of lips.

Alcohol: About 70 % of people that have oral cancer, use so much alcohol. The possibility of suffering from oral cancer increasing with use of alcohol and drugs, together. This possibility is 100 % more for other people.

Chewing tobacco: Most people of south-eastern of Asia, south of Asia, chewing tobacco. Chewing of gutka also is common that is mix of tobacco and nicotiana. Both these drugs related to increase of suffering from oral cancer.

Ultraviolet ray: lip cancer is more common among people that work outside and exposure to sun too long.

Low nutrition: studies have showed that there is a relation between nutrition with low fruit and vegetable and suffering from oral cancer.

Papillomavirus infection (HPV): Human papilloma virus or HPV concludes about 100 virus. Most of HPVs lead to wart but some of them cause cancer.

Considerably it relates to neck cancer. It, also, is one of factors to suffering from oral cancer. About 25% of ills affected by HPVs that also see in neck cancer. There is a strong connection between HPV-16 and oral cancer. Gradually HPV has more effect on oral cancer than neck cancer. Someone who has oral cancer that related to HPV, doesn't eager to cigar or alcohol and their disease is predictable. HPV infections have no sign in mouth, throat and only little percentage lead to cancer.

Stop of immunity system: Use of medicines that stop immunity system like medicine that prevent to refuse implant or treat special disease of immunity system increase suffering from oral cancer.

Lichen planus: People who have intensive condition of this disease, usually have itchy acnes but often appear like lines or white stops in mouth or neck, have more probability to suffer from oral cancer. Lichen planus has effects on middle-aged.

Groft-versus-host disease (GCHD): This condition can exist after implant of tooth root that can replace narrow stone after treatment of cancer. Cells of new root, may has one reaction to self-cells of patient, so maybe some tissues has been removed.

Genetic syndromes: some of hereditary genetic mutations that cause different syndromes in body, have more possibility for oral cancer; as follows:

Fanconi anemia: This bloody condition creates from abnormality of some genes. Related problems begin in young ages that lead to blood cancer or anemia. People with this anemia suffering from oral cancer 500 times more than others.

Dyskeratosis congenital: This genetic connection can leads to anemia and increases oral and throat cancers in young ages.

Symptoms of oral cancer: First symptoms of oral cancer can made a mistake with another diseases such as cold, toothache if symptoms last for some days or weeks, its necessary to visit your doctor. Many of these symptoms result from easier problems or another cancers. Some common symptoms of oral cancer are as follows:

1-Insensibility of tongue or another part of mouth: Permanent wound of mouth: Wound in mouth that doesn't cure, is the most common symptom of oral cancer

2-Inflation of jaw that hurt false tooth or lose it. Long lasting pain of mouth, another common symptom for oral cancer

3-Loosed tooth: Swelling or thickening of cheek

4-Toothacke: White or red stop in tongue, gum or wall of mouth

5-Change of voice: pain in throat, feels that something stuck in throat,

6-Swelling in throat: Difficulty to swallowing or chewing the food.

7-Lose weight: Difficulty to move the jaw or tongue

If these symptoms last for some days or weeks, doctor may suggests tests that can check the existence of cancer. Like every kind of cancer, recognition of cancer as soon as possible, leads to assurance of its treatment.

2. METHOD OF REVIEW

Steps of make of system: one of the most common methods of design that used by expert system's maker, is design of an expert system for diagnosis. In this method Prototype systems that not yet ready for formal delivery, show to the users in order to obtain necessary feedback and perform necessary reforms on system. This method includes three steps:

- Analysis
- design
- Performance

That they repeat together. The method of this research is prototype. So first purpose of expert system introduce, the related researches and Identification of software and hardware, related experiences has studied. Than the environment of

expert system has described, the system analyze and design. In the next step, the components of expert system has identified. The software study and specify that can support the component of system. Finally the system has made.

2.1 components:

An expert system of diagnosis and recommendation about oral cancer has 3 main components: 1-sub-system of conclusion. Schematic diagram of parts of expert system has showed in figure1. In order to design of system, use c# software as a user agent.

2.2 sub system of knowledge unit:

For access to knowledge system we are Blocky and Moukler diagrams. Blocky diagrams are diagrams that the main features has identified and they are appropriate for show the relation between factors and purpose. Blocky diagrams related to diagnosis of oral cancer in first level include blood test, WBC, H.C.T, P.L.T, include 7 sub-parts with sexuality of lymph, hemoglobin, RBC. These diagrams don't help for writing at rules because they don't have specific details for this purpose. In this regard it should be some diagrams that specify the relation between main factors on purpose with identify the problems, rules, recommendation. Moukler or relationship diagrams are diagrams that are suitable for this purpose. Moukler diagrams is one of useful method for description of relations between factors and purpose that identify purpose through entrance problems and shows rules and description made by original sample. Variables in Moukler diagrams are indirect lines and related decisions are inside the triangle in order to perform the final decision that is diagnosis of disease. Moukler diagram made by produced Blocky diagrams. First level of Moukler diagram for diagnosis of oral cancer has shown in figure1.

As specified, duration of disease is on direct line and related choices of problem are below that line. Problems related to blood test and symptoms of disease are in the next level that for receive the user's answer in variable of blocky diagram. Since problems and options that user should identify to answer each question, specify with drawing Moukler diagrams, we can determine different results and situations that maybe user uses for answer to each question.

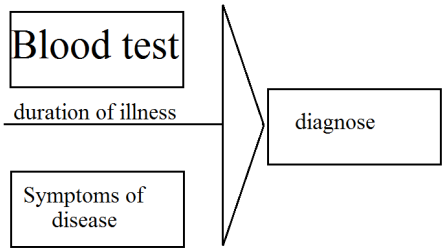

Fig1: Moukler diagram

2.3 Sub system of conclusion:

In systems based on rules, conclusion motor selects one rule for test and study that whether it's condition is true or not. This situation maybe study through interview. When situation related to situation of rule is true, then the result of that rule is true. Therefore this rule activated and the result add to knowledge unit.

2.4 sub system of user connection:

User connection of expert system should have high power's interchange in order to structure of information interchange performs in the form of conversation between an expert person and applicant. For ease in interchange of information, user connection provides with compiler c# that on the basis of rules, asks some questions of user and answers of the questions, conclusion has done and provides suitable answer to user. In the next level the steps of expert system describe with one applied example.

3. DISCUSSION AND RESULTING

The purpose of this research is to provide an expert system for diagnosis and suggestion of treatment for oral cancer. So the aim and purpose of expert system has defines, then the related studies and identification of software and hardware and related experiences has studied and the environment has described. After that we analyze and design the conceptual's system. In the next level the parts of system has determined and user connection produces with compiler c#.It should be provided systems that can simulation of behavior of specialists but this problem is not possible. The disadvantage of designed system is, there is no clinical review and only acts based on user's answers and can't study the correctness of user answers.

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