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TECHNOLOGY****DESIGN AND DEVELOPMENT OF MEDICAL DIAGNOSIS APPLICATION FOR
ALZHEIMER'S DISEASE (AD) DIAGNOSIS****Raghu Korrapati & Geetha Manchikalapudi***

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ABSTRACT

This research aims at conducting a study of computerized application in medical diagnosis with reference to protein-protein interaction analysis of oxidative stress proteins in Alzheimer's Disease (AD). It can help medical practitioners, representatives and scholars to better understand computer application in medical diagnosis specifically with regard to AD. This study can also offer them with potential topics for further investigation as well as give an idea about areas that are in need for improvement. This study has significance to the medical and healthcare community, as it will contribute to earlier research in the field of medical diagnosis, computer aided diagnosis, oxidative stress in Alzheimer's disease, use of computer aided diagnosis for AD.

KEYWORDS: Medical Diagnosis, Computer Applications, Alzheimer's Disease (AD), Protein Analysis, Bio-Informatics Study

INTRODUCTION

Medical decision support systems (MDSS) was developed specifically to enable medical practitioners to take decisions with regard to a patient and his condition. Among the range of complex systems, it include computerized diagnostic tools that, although are labor intensive and require extensive patient specific data entry, are useful as an added measure when a patient has a confusing list of symptoms and an unclear diagnosis. Other systems, both simple and complex, may be integrated into the point-of-care and provide accessible reminders to physicians regarding appropriate management based on previously entered data. These systems may be most practical when coupled with electronic medical records. Finally, through their integration with practice guidelines, decision support systems may provide physicians with suggestions for appropriate care, therefore decreasing the likelihood of medical errors. Thus, such computer technologies and applications are used to not only to provide swift service but most essentially to help doctors and medical professionals with diagnosis of wide range of diseases and ailments.

Thus, computer technologies and applications have tremendous significance in various facets of medical sector and this paper aims at discussing the significance of computerized application in medical diagnosis especially with regard to Alzheimer's disease. According to Rogers et al. (1978), the ability of computer aided systems to empirically diagnose diseases as efficiently as an average physician validates that computer systems, in fact, do possess certain capabilities, which makes it appropriate for an aid in the diagnostic decision making process. Modern medical diagnosis is dependent on computer technology and therefore there is a need to study and understand how such technology can be used to identify and diagnose Alzheimer's disease.

With the increased use of computer application for medical diagnosis of most diseases, attempts are being made to incorporate such technology in diagnosis of neurodegenerative diseases like Alzheimer's. In the 1960s imaging techniques were developed like Single Photon Emission Computed Tomography (SPECT) that were used later to understand certain aspect of brain functionality, which would help understand and diagnose AD (Ramirez et al., 2008). Similarly, Positron emission tomography (PET) is used with the goal to detect onset of AD early. A complete Computer aided diagnostic system can help early detection of Alzheimer's type dementia (ATD) by SPEC image classification (Ramirez et al., 2008). Little or no research exists on studying the role of computerized application in medical diagnosis with reference to protein-protein interaction analysis of Oxidative stress proteins

in AD. This study aims at bridging that gap in literature and study the function of computerized application in diagnosing AD.

PROBLEM STATEMENT

There exists very little or negligent research with reference to the relationship between protein-protein interaction network analysis of oxidative stress related proteins in Alzheimer's disease (AD). Some of the most essential studies in this area have been conducted by Smith, Rottkamp, Nunomura, Raina, & Perry (2000); Bonda, Wang, Perry, Nunomura, Tabaton, Zhu, & Smith (2010); Christen (2000), Madeo & Elsayad (2013); Hardy & Selkoe (2002) and Mullan & Crawford (1994) who have investigated and discussed the role of oxidative stress proteins in AD. According to Smith *et al.* (2000), suggests that there is an increased awareness with regard to the groundbreaking part played by oxidative stress and redox-active transition metals in Alzheimer's diseases as well as other neurodegenerative diseases. However, there is a lack in research that addresses the technical aspect related to this notion i.e. how computerized application in medical diagnosis can be instrumental in understanding the protein-protein interaction analysis of Oxidative stress proteins in Alzheimer's disease.

RESEARCH QUESTIONS

A research problem is an expression about a topic of concern, a condition that needs attention, or a difficulty that needs to be removed (Bryman, 2007). The research question(s) are structured to address the research problem and help the researcher conduct the study and present with relevant results that answer the key questions. Research questions that focus on studying computerized application in medical diagnosis with reference to protein-protein interaction analysis of oxidative stress proteins in Alzheimer's disease.

The research questions (RQ) devised for this study are as follows:

- What is the use of computer application in medical diagnosis?
- How can computerized application in medical diagnosis be influential in understanding of protein-protein interaction analysis of oxidative stress proteins in Alzheimer's disease?

This study will conduct an insightful study into computer applications in medical diagnosis as well as collect data to understand the application with regard to Alzheimer's disease. The results of this study will not only answer the key research questions but also provide avenues for further research in the field and help advance medical diagnosis in case of AD.

SIGNIFICANCE OF THE STUDY

The aim of this research is to study the use of computer application in medical diagnosis with reference to protein-protein interaction analysis of Oxidative stress protein in Alzheimer's disease. It is hoped that through this research, there will be a better understanding of computer applications and their uses in medical diagnosis especially in case of Alzheimer's disease. This will enable medical practitioners and scholars to align their knowledge about the computer aided diagnosis with reference to their knowledge about the role of oxidative stress proteins in Alzheimer's disease. The study seeks to provide an insight into notions that impact Alzheimer's disease, protein-protein interaction analysis, Oxidative stress, computer application in medical diagnosis, and the relationship among these notions. This study predominantly draws from two key areas of on-going research: medical diagnosis systems and Oxidative stress proteins in AD. Although these areas have independent research programs but there is significant gap in knowledge that needs to be explored. This study will help bridge the gap in knowledge in the areas of computer aided medical diagnosis and Oxidative stress proteins in AD.

As suggested by Gorry and Barnett (1968), the main advantages of a computer is in its ability to:

- Store large amount of data without alteration over a time period;
- Recollect data as exactly stored, on receiving relevant and appropriate message;
- Execute complicated logical and mathematical processes at an extremely high speed; and
- Present many diagnostic probabilities in an orderly manner.

Such qualities can assist doctors and medical representatives to make an informed choice and in the case of this study help identify or the potential of AD in early stages.

The results of this study will provide with the necessary knowledge for the academic community and practitioners. This study will also be beneficial for scholars who intend to contribute to advancement of medicine using computer science techniques. The study will help identify the role of oxidative stress proteins in AD and perhaps

assist in new drug discovery and thus be instrumental in saving many lives. This study will be valuable to future research on computerized application in medical diagnosis and lead to development of other technologies, which can enhance medical and healthcare. Doctors, medical personals, healthcare professionals, researchers and educators will gain from this insightful study and try to implement and improve the poor condition and knowledge of Alzheimer's disease with computer technology.

SUMMARY AND FURTHER RESEARCH IDEAS

This research aims at conducting a study of computerized application in medical diagnosis with reference to protein-protein interaction analysis of oxidative stress proteins in AD. It can help medical practitioners, representatives and scholars to better understand computer application in medical diagnosis specifically with regard to AD. This study can also offer them with potential topics for further investigation as well as give an idea about areas that are in need for improvement. This study has significance to the medical and healthcare community, as it will contribute to earlier research in the field of medical diagnosis, computer aided diagnosis, oxidative stress in Alzheimer's disease, use of computer aided diagnosis for AD.

Attempts to undertake a research into the field related to technology and medical care is exceptionally important for the society as it can help detect various diseases and their symptoms as well as improve the standard of healthcare facilities. Advancements in computer aided medical diagnosis and AD can help detect early onset of AD, predict the possibility of its occurrences in individuals, and help both doctors and patients to be better prepared in order to avoid or delay the onset of AD among other things. This study will be a basis for additional research in the field and play an important role in medical education and research. Advancement in AD and computerized application in medical diagnosis will help save many lives which will then contribute in betterment of the society. Thus, this study will indirectly bring about a positive social change, which will help build a better world.

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