

Autoimmune diseases - a wider perspective

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Abstract - Immune system is one of the most important systems in the human body since it protects human body from the diseases and infections. In certain peoples, the immune system fails to function correctly and it mistakenly misidentifies healthy tissues as being foreign and attacks them as well. This can lead to a variety of health issues which is known as autoimmune diseases. Autoimmune diseases are disorders caused by an immune response directed against the body's own organs, tissues and cells. There are more than 80 different types of autoimmune diseases that exist. Symptoms of autoimmune diseases often come and go which may flare up from time to time which means the symptoms may come on suddenly and requiring immediate medical attention. There is currently no cure for most autoimmune diseases, but researchers are looking for new ways to treat them. Medications can help manage symptoms and in some cases, may even help slow the progress of the disease. This study reviewed about the wider perspective of the autoimmune disease in the human body and analyzes the reason for immune disease in human from the previous literature. The findings of the study reveal that genes are the major cause of the autoimmune diseases in the human body.

Key Words: Auto immune diseases, Perspective, Prediction

1. Introduction

Immune system is the accumulation of structures and procedures inside of the body to ensure against disease or other conceivably harming outside bodies [1]. At the point when working appropriately the immune system recognizes a mixture of dangers, including infections, microscopic organisms and parasites and recognizes them from the body's own sound tissue in like manner. Typically the immune system's white platelets help shield the body from destructive substances, called antigens. Illustrations of antigens incorporate microscopic organisms, infections, poisons, tumor cells and blood or tissues from someone else or species. The immune system produces antibodies that obliterate these unsafe substances. There are more than 80 distinct sorts of autoimmune system disorders exists where some of them

are rheumatoid joint inflammation, type 1 diabetes, Hashimoto's illness, scleroderma and so forth [2].

An autoimmune disorder is a condition happens when the immune system erroneously assaults and obliterates healthy body tissue [1-3]. When you have an autoimmune disorder your insusceptible framework does not recognize healthy tissue and antigens. Subsequently the body sets off a response that destroys typical tissues. The definite reason for autoimmune disorder is obscure. One hypothesis is that a few microorganisms, (such as bacteria or viruses) or medications may trigger changes that befuddle the resistant framework [4]. This may happen all more frequently in individuals who have qualities that makes them more prone to autoimmune disorders.

In patients with an autoimmune disorder, the immune system can't differentiate between healthy body tissue and antigens. The outcome is an immune reaction that annihilates ordinary body tissues. This reaction is a hypersensitivity response like the reaction in unfavorably susceptible conditions [5]. In allergies, the immune system responds to an outside substance that it regularly would ignore. With autoimmune disorders, the immune system responds to ordinary body tissues that it would normally avoided.

1.1 Influence of the autoimmune disease

An autoimmune disorder may bring about: The obliteration of one or more sorts of body tissue, abnormal development of an organ, Changes in organ work, An autoimmune disorder may influence one or more organ or tissue sorts. Organs and tissues usually influenced via autoimmune disorder include: Blood vessels, Connective tissues, Endocrine organs, for example, the thyroid or pancreas, Joints, Muscles, Red platelets and Skin. A person may have more than one autoimmune disorder in the meantime [1-10].

Symptoms of an autoimmune disease ailment differ in light of the disease and area of the abnormal immune reaction. Manifestations that regularly happen with immune system sicknesses include: Fatigue, Fever and General sick feeling (disquietude), Joint agony and

Rash. The objectives of treatment are to: Reduce symptoms, Control the autoimmune process, maintain the body's capacity to battle ailment [15].

Which medications are utilized relies on upon the particular ailment and your symptoms. Few patients may need supplements to supplant a hormone or vitamin that the body is deficient [11]. Illustrations incorporate thyroid supplements, vitamins such as B12 or insulin infusions. In the event of autoimmune disorder influences on the blood, it may need blood transfusions. Individuals with autoimmune disorder that affect the bones, joints or muscles may need assistance with development or different capacities [13]. Prescriptions are regularly recommended to control or diminish the immune system's reaction. They are regularly called immunosuppressive prescriptions. Such medicines may incorporate corticosteroids and nonsteroid medications, for example, azathioprine, cyclophosphamide, mycophenolate, sirolimus or tacrolimus. The effect of autoimmune disease are stated as,

- Supplements to supplant a substance that the body needs, for example, thyroid hormone, vitamin B12, or insulin, because of the immune system illness
- Blood transfusions if blood is influenced
- Physical treatment to help with development if the bones, joints, or muscles are affected.

Numerous individuals take medications to decrease the resistant prediction irregular reaction. These are regularly called immunosuppressive solutions. Illustrations incorporate corticosteroids, (for example, prednisone) and nonsteroid medications, for example, azathioprine, cyclophosphamide, mycophenolate, sirolimus, or tacrolimus [3].

The prediction of the autoimmune diseases is the most difficult task for the person affected with the immune diseases and the doctor's. Symptoms of the autoimmune diseases are the rare to predict and treat so, it is necessary to analyze the causes and symptoms of the autoimmune diseases in the wider way. This paper reviewed about the causes for the autoimmune diseases in the human body in the existing literature survey. Findings of the review show that the genes are the major cause for the autoimmune diseases in the human body.

2. Literature Review

Julio J. Valdes et al., (2007) presented about an analysis of microarray gene expression information from patients with and without scleroderma skin infection

utilizing computational insight and visual data mining procedures. Virtual reality spaces are utilized for giving unsupervised understanding about the data substance of the first classification of qualities depicting the articles. These spaces are developed by half breed streamlining calculations in light of a mix of Differential Evolution (DE) and Particle Swarm Optimization separately with deterministic Fletcher-Reeves advancement. A disseminated pipelined data mining calculation made out of grouping and cross-approved hash sets examination is connected keeping in mind the end goal to discover subsets of applicable properties with high order abilities. At long last, hereditary programming (GP) is connected so as to discover unequivocal explanatory expressions for the trademark elements of the scleroderma and the typical classes.

The virtual reality spaces connected with the classification of capacity contentions (qualities) are additionally processed. A few little subsets of qualities are found which are fit for grouping the information with complete precision. They speak to qualities possibly pertinent to the comprehension of the scleroderma illness. This is connected with the variability presented by the expansive classification of distinctive DE techniques utilized, some of which have substantial inter quartile ranges. Dim circles were utilized to show the area of scleroderma tests and light ones speak to those of the typical class. Additionally, curved structures are incorporated as helps for imagining the class dissemination yet this data is just of relative worth as the class data was not utilized as a part of the reckoning of the VR space. On account of PSO the change of its hybridization with the FR method is considerably bigger than for the DE case. At the point when the DP-DM system was utilized for discovering sub-sets of pertinent qualities were acquired. A percentage of the subsets have high correctness's when foreseeing the scleroderma and the typical classes and among them three were chosen for a nitty gritty examination.

Qinglin Zha et al., (2009) investigated about the symptoms of rheumatoid arthritis prediction in American College of Rheumatology from 20% response (ACR20). The obtained results are analyzed with decision tree and neuron network was explored. The data are collected from 489 patients were haphazardly partitioned to get Western drug (WM) treatment, 247 cases and conventional Chinese solution (CM) treatment (TCM), 242 cases. ACR20 reaction was utilized as viability assessment point. The side effects at pattern were gathered and dissected for ACR20 reaction expectation with choice tree and neural system strategies and 75% information were for preparing and 25% information for confirmation set. The outcomes were confirmed in the check information sets. For neural system investigation, the preparation information from

CM and WM treated patients were put into the neuron system model and the Lift Chart was made which demonstrated that the aggregate compelling rate could be anticipated to be 80% if right 10 rate of patients treated in light of the picked side symptom in CM and to be 98% if 20% rate of patients treated in view of the picked manifestations in WM.

Symptoms from TCM have prescient parts for ACR20 reaction assessment in RA. In this examination, the medications were utilized as a part of a method for western solutions, however the paper is meant to demonstrate the relationship between ACR20 reaction and side effects/signs and investigate the prescient part of side effects for ACR20 reaction in RA with choice tree examination. More inquires about demonstrated that the side effects/signs are identified with the obsessive changes of infections and have relationship with compelling reaction. A study reported that 107 facility patients with bad tempered gut disorder could be isolated into three subgroups and recommended that the infection could be partitioned into diverse bunches. In this study 18 side effects and tongue appearance much of the time utilized for CM design separation as a part of RA were gathered together with signs and lab estimations for the information mining.

The outcomes demonstrated that the ACR20 reaction can be diverse in the patients with distinctive mix of side symptoms both in WM and CM treatment. The outcomes propose that the individualized treatment could be incompletely acknowledged by picking the right patients with those prescient manifestations for the treatment. At the end of the day, CM treatment even WM treatment would have better adequacy in the event that it is utilized as a part of the right patients with right CM example in view of CM symptoms. Taking everything into account, side effects or symptoms could have the prescient part for ACR20 reaction of treatments in RA and the outcomes propose that CM treatment would have better viability in RA treatment in the event that it is utilized as a part of the right patients with right signs which are significant proof for CM design separation.

L. Beretta et al., (2010) analyzed about the Systemic sclerosis (SSc) in a multiorgan disease with high mortality rates. A few clinical components have been connected with poor survival in distinctive populaces of SSc patients however no unmistakable and reproducible prognostic model to evaluate singular survival expectation in scleroderma patients has ever been created. We utilized Cox relapse and three data mining based classifiers (Naive Bayes Classifier [NBC], Random Forests [RND-F] and logistic regression [Log-Reg]) to add to a powerful and reproducible 5-year prognostic model. Every one of the models were manufactured and inside approved by

method for 5-fold cross-acceptance on a populace of 558 Italian SSc patients. Their prescient capacity and ability of speculation was then tried on an autonomous populace of 356 patients selected from 5 outer focuses lastly contrasted with the expectations made by two SSc area specialists on the same populace.

The review outcome of the reveal that the NBC outflanked the Cox-based classifier and the other data mining calculations after inner cross-approval at the rates of (zone under getting administrator trademark bend, AUROC: NBC=0.759; RND-F=0.736; Log-Reg=0.754 and Cox= 0.724). The NBC had likewise an amazing and better exchange off in the middle of affectability and specificity than the Cox-based classifier when tried on an autonomous populace of SSc patients (BA: NBC=0.769, Cox=0.622). The NBC was likewise better than space specialists in anticipating 5-year survival in this populace (AUROC=0.829 versus AUROC=0.788 and BA=0.769 versus BA=0.67). The predicted results give a model to make reliable 5-year prognostic expectations in SSc patients. Its inner legitimacy and in addition ability of speculation and lessened vulnerability contrasted with human specialists bolster and its utilization.

Vassiliki Gkantouna et al., (2012) studied about the hereditary disease transmission of immune system ailments is a noteworthy matter for the overall academic group. From the already report it shows that the improvement of dAUTObase a database recording singularly epidemiological information of immune system infections in different populaces around the world. Here the display of an imperative update of the dAUTObase framework concentrated on the improvement of new information perception devices situated to further help the powerful information questioning and the data mining procedure. Since dAUTObase is the first endeavor towards the foundation of geo epidemiological databases for Ads the essential objective was to give researchers a capable device to the investigation of the autoimmunity the study of disease transmission. The overall gathered and screened an expansive number of epidemiological studies on ADs breaking down their frequencies in different populaces around the world. The given exceptional accentuation on the recognizable proof of frequency and predominance rates while likewise enrolled extra data if exhibited. The following step was the compelling visual representation of the gathered data in a manner that would give specialists the chance to investigate, examine and comprehend the screened information. The result of the added information representation environment for the dAUTObase information gathering intended to give clients a substantially more instinctive approach to exemplify the lot of data without losing their introduction.

This study gives the broader view of the autoimmune disease prediction in the human body. Autoimmune diseases (ADs) are characterized by loss of self-tolerance and an altered immune response which lead to tissue and organ damage caused mainly by autoantibodies that attack the body own healthy tissues. Hence from this study it is emphasizes that the gene improper function is the main cause of the autoimmune disease.

Adebayo Peter Idowu et al., (2013) proposed a Mathematical Model (MM) for predicting immunize able diseases that affect children between ages 0 - 5 years. The model was adjusted and conveyed for utilization in six chose confined zones inside Osun State in Nigeria. Utilizing the MATLAB's ANN (Artificial Neural Network) tool stash, the Statistics tool kit for clustering and relapse and the Naive Bayesian classifier and the MM was created. The MM is vigorous in three exploits like information mining systems like ANN, Decision Tree Algorithm and Naive Bayes Classifier. These information mining strategies gave the methods by which shrouded data were found for recognizing patterns inside of databases and therefore encourage the expectation of future sickness event in the tried areas.

As a method for examination, from the outcomes talked about so far and as saw from the diagrams and the relating MM acquired, the mistake in the prescient capacity of the models were minimized utilizing the relationship coefficient. Acquired results demonstrated that maladies have crest periods relying upon their epidemicity, subsequently the need to sufficiently oversee vaccination to the right places at the perfect time. Accordingly, this paper contends that utilizing this model would upgrade the adequacy of routine inoculation in Nigeria.

Based on this review the enhancement of confidence in ensuing findings like there is the need to deepen and widen the understanding of immunization agencies in Nigeria, so that they can be more proactive in their life saving responsibilities; and (iii) the advantage of using diverse viewpoints – triangulation approach to cast light on a focus. This were believe would give rise to explain to decision making regarding planning as suggested in and consistent with the recommendation.

From the equations of the three models that represent the best linear fit of data points of the training output, the following variables were defined and used. While R = Correlation Co-efficient (the strength of the relation between the input data and training data; the higher the strength was, the higher the value of R); A = Actual data; and T = Training data. The trained data shows that the major cause for the autoimmune disease is the

gene in the human body and the malfunction within the body.

S. Gomathi and V. Narayani (2014) studied about the prediction of Lupus autoimmune disease. The information mining procedures like Classification and Regression Tree (CART) a choice tree is utilized to group the information set and predicts the malady effectively. Likewise Cartesian calculation is utilized to quantify the attributes to break down 45 lupus patients who are adequately connected to anticipate the lupus. At the point when contrasted and classification and Regression Tree with Cartesian calculation CART is observed to be more viable in infection expectation. For forecast of Lupus illnesses CART is a decision tree calculation; a decision tree is created to demonstrate how the investigation and expectation is finished. Critical credits to anticipate lupus is classified and 45 patients have been dissected and analyzed utilizing CART.

Since Lupus is a type of immune diseases which cannot be predicted at the earlier stages also this type of disease is unable to cure. In this research analyzed and suggested a efficient method for predicting the Lupus disease in the earlier stage. Also this research reveals that women have more chance of affecting with Lupus diseases than men. According to the review it is shown that the menstrual period is the main symptom for the Lupus immune disease cause.

The research demonstrate a clearly that most of the lupus patients suffer with photosensitivity and have symptoms like alopecia, malar rash, oral ulcers, raynaud's symptoms (blue colored finger) and vasculitic rash.

Gregorio Alanis-Lobato et al., (2014) analyzed about the list of autoimmune diseases curate by the American Autoimmune Related Disease Association. In this research removed qualities connected with autoimmune disorder from the GWAS Catalog and built a bipartite system of illnesses and their related qualities. Then anticipated this system to its one-mode structure, where a couple of qualities are connected with a weighted edge demonstrating the quantity of sicknesses they are both connected with. The alluded is undirected, weighted system as the ADN. After the utilization of a group location calculation in view of Modularity Optimization it is observed that qualities connected with the same or with related illnesses bunched together. The execution of various topological connection indicators (records that dole out probability scores to nonadjacent sets of hubs in view of the system topology) when connected to the groups that are not totally joined (in particular the blue, pink, green, grass and maroon modules).

This research is considered for the because of the following reasons since the interactions of genes like AFF1, AGXT2L1 and AG1P7 with INSR. The products of these genes are involved in proper. Thus, their simultaneous mutations may explain the blood filtering problems in IgA Nephropathy or the affection of blood vessels in Kawasaki Disease or Lupus blood filtering and toxin secretion. This means that mutations in this set of genes may impact signaling by Ca ions and explain Ca associated problems in AIDS or Psoriasis. This study explained about clearly that the genes are the important cause for the cause of the autoimmune disease in the human body.

G. Rasitha Banu et al., (2014) analyzed about the prediction of overactive thyroid the amount of huge amounts of data generated by healthcare transactions and voluminous to be processed and analyzed by traditional methods using data mining approach. Data mining gives the system and innovation to change these hills of information into valuable data for choice making. Clustering and Classification are the two data mining technique used for the prediction of autoimmune diseases. By and large the idea of order is befuddled by method for bunching, yet there is distinction between these two systems. As per the point of view of Machine learning bunching system is unsupervised learning and tries to gathering classifications of items having relationship between them, though order technique is regulated and doling out articles to sets of predefined classes. Hyperthyroidism (overactive thyroid) is a condition in where thyroid organ creates a lot of the hormone thyroxine. Hyperthyroidism can quicken body's digestion system altogether, creating sudden weight reduction, a fast or sporadic pulse, sweating, and anxiety or crabbiness.

DBSCAN calculation is utilized for foreseeing the thyroid illness with the related indications. In the defined techniques all items in the information set are thought to be unassigned. DBSCAN then picks a self-assertive unassigned article p from the data set. Additionally characterize the dataset utilizing Hierarchical different classifier characterization plan, which safeguards the quality of the various classifier methodology furthermore figures out how to decrease a portion of the issues confronted by other numerous classifier calculations. Along these lines the information are arranged in productive way give precise data. The client can anticipate and test their wellbeing with the side effects of the overactive thyroid. The client can anticipate the thyroid malady with related side effects. The client can foresee the ailment with important indications.

Wilco W.M. Fleuren and Wynand Alkema (2015) investigated about the techniques that are used for a text mining approach and give an overview of the text mining

tools that are currently being used and the type of problems they are typically applied for. The initial phase in TM is to recover applicable literary assets for a given subject of hobby. This procedure is alluded to as data recovery (IR) and is ordinarily done by questioning bibliographic databases with an classification of decisive words. The most utilized IR framework by specialists as a part of the biomedical space is PubMed that offers access to open source full content articles and edited compositions of the MEDLINE database. After data recovery (IR), the subsequent record set can be broke down via look calculations for the event of particular essential words of interest and proclamations on the relations between those pivotal words. A key step in this is named substance acknowledgment (NER). This implies that for instance, a particular quality ought to be perceived in the content by its quality image, as well as by the equivalent words and past names.

For instance to approve the gene-gene relations got from the writing, correlation with quality expression, protein-protein cooperation or pathway databases can be made. For the revelation of new medication targets, TM results could be increased with auxiliary data, to choose druggable targets. In collaborating with outside databases, consideration ought to be taken that the information and yield is such that the TM apparatuses can without much of a stretch be consolidated in standard bioinformatics work processes. In the event that TM devices can meet the above difficulties they will keep on being an irreplaceable resource for scientists in the biomedical domine.

S. Gomathi and V. Narayani (2015) examined about the method for predicting Lupus disease. The remote bodies imagine like an immune system framework and assault the antibodies. Thusly the immunizer gets to be auto antibodies and reasons different irritations in the human body and influences different organs. The different signs and side effects of SLE includes weakness, poor quality fever, weight reduction, loss of voracity, joint pain, myalgia, facial rash, photosensitivity, pleuritis, pericarditis, Raynaud's marvel, alopecia, jaundice, lumphadema. The manifestations won't be basic for every one of the patients who are influenced with SLE. Subsequently the analysis and expectation gets to be mind boggling. Enormous information investigation is a proficient innovation which is broadly utilized as a part of numerous divisions. Therapeutic field is the always blasting field where the information are mind blowing. Along these lines applying enormous information in human services will yield a most astounding and opportune choice making. The results display the significance of utilizing huge information to anticipate lupus illness.

This review shows that the cause for the autoimmune diseases includes the several symptoms for the Lupus diseases. As mentioned before the symptoms for the Lupus diseases include the joint pain, weight loss etc. Which are all caused due to the improper function of the gene within the human body.

Gomathi. S, V. Narayani (2015) analyzed about the development of an expert diagnosis system to detect Systemic Lupus Erythematosus (SLE) disease using association rule and neural network. The classification algorithm is compared with two algorithms (J48 and Support Vector Machine) to measure the performance of neural network. Apriority algorithm (Association rule algorithm) is used with neural network to obtain the fastest, efficient and complex free diagnostic system to detect SLE disease. A new prediction technique is proposed to detect the disease in earlier stage. Neural Network is distributed information processing structure which has multiple number of processing elements denoted as node which in turn interconnected via unidirectional signal channels called connections.

The results reveal that an expert system to predict lupus is presented in this paper using Apriori and Neural Network Algorithm. Neural Network proves the better output which helps the domain experts for better diagnosis and results Comparison with other classification technique is done. This review shows that the SLE is an auto immune inflammatory and chronic disease which produces auto antibodies on white blood cells (WBC). It affects females than male in the ratio of 10:1 and between 20-40 age limit. It affects many organs so called as multi system disorder. Many organs include cardiovascular, pericarditis, coronary artery, myocarditis, skin, lungs, kidney nervous system etc. There are no curing methods or surgeries for Lupus but it can be predicted in advance if advanced technique has been implemented. Since the disease affects all parts of the body, it predicts like other disease. Also this article shows that the malfunction of the gene is the main cause for the autoimmune disease.

Vaishali S. Parsania et al., (2015) examined about the methods applied usually to uncover concealed knowledge from massive data stacked up in databases. One of the potential fields of Data mining application is social insurance frameworks in which the undeniably extensive measure of information are populated in the databases. Such populated databases need the use of suitable data mining procedures to remove the learning examples which are basic choice making and in addition consideration taking frameworks. In the field of social insurance gigantic measure of information is created and populated in databases. These databases are essential for information extraction and its uses for cutting edge advancement of wellbeing of people. The Electronic Health

Record (EHR) database for an ailment of Rheumatoid Arthritis is considered in the exploration work. It incorporates the information from various frameworks of drug which incorporates Ayurvedic classification of pharmaceutical and Allopathic classification of solution. The order calculations of BayesNet, Naive Bayes, ZeroR, JRip, OneR and PART are actualized on EHR of Rheumatoid Arthritis. Results are gotten for 100, 500 and 1000 examples of EHR to incorporate a relative methodology for examination. The after effect of clustering calculations connected on distinctive size of EHR of Rheumatoid Arthritis has been assessed from the tables and graphs.

This review reveals that Rheumatoid Arthritis is caused due to the malfunction of the gene. Improper behavior of the gene is due to damage in the gene sequence in the human genetic. Also this review demonstrates that gene is the major cause of the autoimmune diseases.

3. Conclusions

Autoimmune diseases are more difficult task for predicting in the earlier stage of the human body. Autoimmune diseases are disorders caused by an immune response directed against the body's own organs, tissues and cells. There are more than 80 different types of autoimmune diseases are in exists. Symptoms of autoimmune diseases often come and go which may flare up from time to time which means the symptoms may come on suddenly and requiring immediate medical attention.

The review shows that genes are the major cause of the autoimmune disease in the human body. Damaged gene sequence within the body make the immune system to malfunction and causes the autoimmune diseases. If the autoimmune diseases are predicted at the earlier stages it is possible to reduce the effect of the diseases. By using the data mining technique the symptoms of the autoimmune diseases can be analyzed and person suffering with the autoimmune disease can be treated in such way of preventing from the autoimmune diseases.

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