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Research paper

Hereditary immunity in cancer

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Abstract

Cancer is one of the malignant diseases and millions of people worldwide die from cancer annually. Breast cancer diagnosis requires the analysis of images and attributes as well as collecting many clinical and mammography variables. In diagnosis of breast cancer, it is important to determine whether a tumor is benign or malignant. The information about breast cancer risk prediction along with the type of tumor are crucial for patients and effective medical decision making. An ideal diagnostic system could effectively distinguish between benign and malignant cells; however, such a system has not been created yet. In this study, a model is developed to improve the prediction probability of breast cancer. It is necessary to have such a prediction model as the survival probability of breast cancer is high when patients are diagnosed at early stages.

Keywords: *Hereditary; Immunity; Cancer.*

1. Introduction

The breast cancer is the leading cause for cancer–related deaths in women. Due to modern lifestyle, number of diagnosed patients with breast cancer in the developed countries are on the top of the list around the world [1–27]. The most common type of breast cancer is ductal carcinoma, which begins in the cells of the ducts. Breast cancer can also begin in the cells of the lobules and in other tissues in the breast [28–49]. In the U.S., breast cancer is the second most common cancer in women after skin cancer. It can occur in both men and women, but it is rare in men. Each year there are about 100 times more new cases of breast cancer in women than in men. In this project we applied several machine learning techniques on the Wisconsin Diagnostic Breast Cancer data set to classify the cancer based on the feature extracted from images as benign or malignant [50–73].
In the current age, pancreatic cancer is one of the worst forms of cancer. The complications of pancreatic include five types of pancreatitis, benign tumors, malignant tumors, benign cysts and malignant cysts. This cancer has a few clinical symptoms than other cancers. Also, if not treated in a timely manner, it also causes other organs of the body and the patient chance of survival is greatly reduced. One of the ways to detect this disease is to use CT scan images. But the appearance of pancreatic complications is very different in a similar category, and their tissue is very similar to healthy abdominal tissues. For this reason, it's very difficult to identify the range of complications. In this study, the data contained 151CT scan images. These images are divided into five classes of pancreatitis, malignant tumors, benign tumors, malignant cysts, benign cysts and a healthy class. The pancreatic complications are varied and different, if the diagnostic system is based on simple experts; the possibility of achieving high detection accuracy is not possible. According to the results of this study, lonely no classification can detect all diseases and combining these methods is the best option. Therefore, in this study we have achieved high accuracy in prediction (690. 69) by combining the perception, convolution and SVM neural networks.

2. Manifestations of hereditary immunity in cancer

2.1. In first discovery of hereditary immunity to cancer

Polyurethane are biocompatible compounds with variety applications in the biomedical fields mostly as drug delivery vehicles. Their various applications are due to their Maneuverable structure with different blocks of diols and isocyanides. In the new presented work, magnetic polyurethane was used as drug carrier which formed of the reaction of Poly–caprolacton and isophoren diisocyanate and finally cyclodextrin as the cross linker. Characterization of the final polymer and certainty of its formation was done through different analytical methods such as FT–IR, TGA, XRD, SEM, TEM and VSM. On the other hand, the percentage of the magnetic nanoparticles in the polymer matrices was tracked using thermal gravimetery analysis. This Nano drug carrier was used for in vitro delivering pharmaceutical agent of doxorubicin. The amount of drug loading and percentage and manner of the drug release were investigated using concentration profile. Cytotoxicity of Nano drug carrier was evaluated using calorimetric method called methylthiazoletetrazolium (MTT) assay on the MCF–7 cell lines and according to the results presented system is very profitable and proper one for delivering Doxorubicin anti–cancer drug [74–93].

Melittin (MEL) is a kind of catalytic peptide that isolated from bee venom. Catalytic peptides are promising drugs for cancer treatment because cancer cells are less likely to develop resistance to a membrane–perturbing agent. However, their nonspecific cytotoxicity has limited their therapeutic applications. In this study, we use citric acid stabilized Fe3O4 magnetic nanoparticles (CA–MNP) as potential magnetic carriers for target delivery of melittin to tumor sites. The morphology and surface functionalization of these magnetic Nano carriers were studied by field emission scanning electron microscopy (FESEM) and Fourier transform infrared. The loading and release profile of MEL were studied by UV spectrophotometry. The results indicate that these magnetic Nano carriers have the high drug loading efficiency and the pH–dependent release behavior. The in vitro cytotoxicity of the MEL–loaded CA–MNP on the MCF–7 breast cancer cell line is similar to that of free MEL in solution at equivalent doses [94–104].

The interest in exploring more effective methods for cancer treatment has increased widely in recent years. In clinical studies it is difficult to determine the temperature distribution in both normal tissue and in tumor during hyperthermia treatment since temperature can be measured in limited number of positions in tissue or tumor. Simulation studies can play crucial role in physician's perception of the temperature distribution in tissue. Hyperthermia treatment is facing some unsolved problems such as the appropriate dosage of magnetic Nano particles required to achieve the optimum temperature which results in apoptosis in tumor cells. In this study, a 2D computational model is created in COMSOL Metaphysics in order to analyze temperature distribution in both normal tissue and tumor during hyperthermia treatment using various dosages of magnetic Nano particles. Temperature distribution is achieved by considering various layers from wave source through to the tumor and also by taking into account the amount of heat generated through the Brownian rotation and the Neel relaxation. Simulations of a spherical tumor located in ellipse tissue were designed. A systematical variation in dosage has been performed. Temperature distribution and maximum temperature in steady state and effect of the dosage of Nano particles [105–117].

2.2. Over observations of cancer prevalence

In this study, cobalt Ferrite nanoparticles with inverse spinel structures were obtained using co–precipitation of cobalt and iron nitrates. Ammonia 15% was used as an alkaline agent for pH adjustment. Besides, we used oleic acid to coat the cobalt ferrite nanoparticles. XRD analysis showed that the samples included spinel ferrite structure. According to the results of SEM the distribution of the particles was homogeneous and the particles were uniform, and pseudo–spherical in shape. The magnetic properties of the material were analyzed by the VSM that showed the relationship between super–paramagnetic properties of the material and particle size. In this research, for the first time, anti–cancer effects of cobalt ferrite nanoparticles on K562 cell line as an experimental model of acute myeloid leukemia (CML) were examined. Because this compound has the potential to induce differentiation and apoptosis, it can be used in conjunction with other pharmaceutical compounds as a promising candidate for the treatment of blood cancer patients [118–143].

Cancer, as a leading contributor to the global disease burden is characterized by the uncontrolled growth of cells in the body, which makes it one of the most difficult and complex diseases to treat. Dietary sources of natural products including fruits and vegetables have been reported to be associated with reduced risk of a variety of tumors and to have anti–cancer benefits, apart from being a good source of nutrients. Thus, among major groups of anti–cancer drugs, plant extracts have received considerable attention to discover promising cancer therapeutic agents from natural sources. Great interest is currently centered on the biologic activities of quercetin a polyphenol belonging to the class of flavonoids, natural products well known for their beneficial effects on health, long before their biochemical characterization. onion skin waste is rich in bioactive compounds such as phenolic and flavonoids. In this direction, Quercetin, a natural compound abundantly present in Onion skin has great therapeutic potential in the prevention and treatment of cancer. This review focuses on anti–cancer potential of Quercetin with current advancements for its implementation in treatment of cancers [144–156].

2.3. Ethnic and racial differences in cancer prevalence

Boron neutron capture therapy (BNCT) is efficient therapeutic methods in cancer treatment based on nuclear capture and fission reactions. In this method, use of the best boron–containing agents for boron therapy and boron delivery agent for delivery of them to the infectious site are key points in therapy efficiency. Our research indicated that calcium fructoborate was the best compound as a boron–containing agent for boron therapy. Furthermore, studies have demonstrated that liposomes can effectively and selectively deliver large quantities of boron to tumors and that the compounds delivered by liposomes have a longer tumor retention time. Indeed, liposomal encapsulation of calcium fructoborate has been extensively evaluated as Nano vehicles for the delivery of boron compounds for BNCT. In this study, we deeply investigate molecular composition of the calcium fructoborate used as a carrier supplement for cancer therapy, by using FT–IR, XRD, TG, DSC and Raman spectroscopic analysis. The experimental measurements agree very well with the molecular formula Ca[(C6H10O6)2B]24H2O [157–173].

Children are one of the easiest affected group from environmental deterioration and detrimental factors, Due to their biological and behavioral differences. And childhood cancer has considered as one of the most common cause of death in children in developing countries. Exposure to some environmental factors during childhood can increase the risk of cancer in the offspring. This study aimed to evaluated the role of living in the pollutant regions and exposure to cigarette or hookah smoke on the incidence of cancer in children. This case control study was considered 22 cases and 100 controls, under 10 years, who was born and lived in pollutant regions of the world in 2014–2015. Regarding to the important risk factors: familial background of underlying diseases or cancer. However, in this ages, Familial background of cancer is considered as the most crucial risk factor of the incidence of cancer in children (P=0.000, OR=7.639, CI 95% 4.230–13.794). Moreover, the second most significant item is live in regions with polluted air (P=0.019, OR=4.222, CI 95% 1.172–15.211) [174–189].

2.4. Population differences in cancer prevalence

Breast cancer is the uncontrolled growth of abnormal cells in the breast area and it is one of the widespread causes of mortality in today's world. So that 8000 people are diagnosed with breast cancer of a year in the world. The exact and precise diagnosis is considered as the vital point in the process of treatment. Among the various methods of screening, thermography is a non–invasive and safe method to detect breast cancer. In this work, a classification algorithm of thermograms with the purpose of detection of breast cancer from gray level co–occurrence matrix based features texture has been proposed. For this purpose, 52 images from the breast of healthy and unhealthy people from the data were collected. The preprocessing and segmentation of data was performed in gray level for the creation of temperature matrix. Finally, the gray level co–occurrence matrix based features was extracted from the matrix and the collection of features using Manhattan technique was the input for weighted K–nearest neighbor classifier. The result of Accuracy was 85.6, Sensitivity was 91.7 and Specificity Index was 81.2 selected as the optimal structure compared to other methods that have been proposed so far [190–203].

Cancer is the third leading cause of death in the world, as well as breast cancer is the second most common cause of death among women in the world. According to calculations by the National Cancer Institute of the United States, one person of every eight women will be diagnosed with breast cancer. Unfortunately, the age of cancer in the world is a decade younger than other developed countries. Therefore, early diagnosis of this disease is essential in the healing process. With detect and remove cancerous tumors in the early stages before spreading to neighboring areas, cancer threats be stopped. Among the various methods of screening, thermography is a non–invasive and safe method to detect breast cancer. In research, at first paid to the automatically way that in this regard, Kenny edge and Hough transform have been enjoying and then a thermography classification algorithm to detect breast cancer based on certain characteristics extraction of the tissue in gray level co–occurrence matrix is provided. For this purpose, 68 healthy and unhealthy images of the breast are collected from the database. Finally, the features set as input are given into the support vector machine classifier. The result of Accuracy was 87.3, Sensitivity was 89.6 and Specificity Index was 83.9 selected as the optimal structure compared to other methods that have been proposed so far [204–224].

Cancer caused by cells goes out of correct pathways. This cell can invade to surrounding healthy cells. There are over 100 different types of cancer and all of them classified by the type of cell that affected. Usually malignancy of gastric cancer starting from layer of the stomach. Gastric cancer has been mentioned as a third cause of death in the world. According to the statistical results, we can see the high frequency of gastric cancer in, Japan, China, Central and South America, Eastern Europe and parts of the middle east. Higher rates usually have been seen group with lower socioeconomic [225–241]. Some signs of this cancer are indigestion or heartburn, vomiting, diarrhea, constipation and having blood in stool. Stomach cancer usually detects in early stage. Each factor that increase the chance of developing cancer is known as a risk factor. Some factors that may increase the risk of stomach cancer are: Age, gender, bacteria, family history, race, diet, previous surgery, smoke and obesity [242–266]. Diagnosis of gastric cancer at first are obtained from laboratory tests and biopsy of stomach with endoscopy. In the next step, cancer may be treated with Surgery, radiation therapy, chemotherapy or immunotherapy [267–284].

Lung cancer is one of the deadliest cancers, such that it causes more deaths compared to breast cancer, colon cancer and prostate cancer and it is mainly because it cannot be diagnosed at early stages due to shortage of symptoms, such that survival rate of patients for 5 years after surgery is only 14%; while diagnosing the disease at early stages increases this probability to 70%. Increasing growth of this disease, difficulty of its diagnosis from images and importance of diagnosis at early stages requires CAD methods with high accuracy. In order to realize this important, a novel algorithm is proposed in this study which selects features online using genetic algorithm and statistical functions. Our purpose is to separate effective features among available features. In order to classify data, a series of data called feature is required for which disease features are used. In many datasets, some features do not affect decisions and they are additional. So selecting an appropriate subset of inputs can be effective in classification accuracy and its speed. For this purpose, genetic algorithm with an objective function based on data sparsity and statistical concepts. The proposed method is implemented and results indicate high accuracy of this algorithm in selecting effective features and increasing accuracy of the classifier compared to basic methods and other studies [285–299].

2.5. Racial differences in the liability to cancer

Cancer is a major cause of death with more than 10 million annual patients. It is possible that this number reaches 15 million patients per year by 2020. Though chemotherapy has largely been successful in controlling and treating cancer, live tissue damage, systemic toxicity and side effects in this method are among the issues that cannot be overlooked. In order to reduce the negative effects of anticancer drugs on normal tissues, we need to design Nano–sized carriers that can pass the safety barriers and body tissues and reach their target site. In this work, the size and zeta potential of Nano–carriers PLGA–Cs–Paclitaxel were evaluated. Chitosan connection in physical or conjugated forms may lead to a significant increase of polydispersity. According to the study carried out on the concentration of Chitosan and the type of absorption, it was concluded that nanoparticles size increases with higher concentrations of Chitosan. The zeta potential will increase, provided the conjugation of Chitosan is higher than physical adsorption [300–311].

We present an optimal control strategy for nonlinear systems with application to the drug therapy of cancer. The tumor growth model is represented by a system of equations from population dynamics which is based on the competition between normal cells and tumor cells. There are quite a number of modern optimization algorithms proposed in the last two decades to solve optimization problems. Particle Swarm Optimization (PSO) and differential evolution (DE) are among the well–known modern optimization algorithms. This research presents a comparative study for min–max constrained optimization using PSO and DE. The comparison is performed on eight benchmark functions f1–f8 [312–322]. New findings have been discovered for the PSO algorithm and the comparison results in this report show that DE generally is better than PSO in term of solution accuracy and robustness in almost all the problems. Generally, from the numerical results and graphic illustrations, we can demonstrate that DE is more efficient and robust compare to PSO, although PSO gives good results in some cases.

Elevated expression of EGFR is a frequent genetic abnormality seen in colon cancer. The monoclonal antibody cetuximab binds to EGFR and thus provides an opportunity to create both imaging and therapies that target this receptor. The main goal of this study was to optimize the radioimmunoconjugation of monoclonal anti–EGFR with 177Lu as a potential molecular tracer for colon cancer radio immunotherapy (RIT). Cetuximab was labeled with lutetium–177 using DOTA as chelator. Radiochemical purity and stability in buffer and human blood serum were determined using thin layer chromatography. The integrity of the radiolabeled antibody was checked by SDS–PAGE. Bio distribution study of 177Lu–DOTA–cetuximab was performed in mice at 2, 24, 48 and 72 hours after injection. Immunoreactivity and toxicity of the complex were tested on SW480 colon cancer cell line. Results: The efficiency of antibody labeling was more than 98%±1. The in vitro stability of the labeled product inhuman serum after 96h was 83 ±2%. There was no fragmentation in the labeled antibody during SDS–PAGE protocol. The highest %ID/g was observed in the blood, liver and lungs. The immunoreactivity of the complex was 91±1 %. At a concentration of 1 nM, the complex killed 22±3% of SW480 cells. At 16 nM, 82±5% of the cells were killed. Radio conjugate of cetuximab and 177Lu were successfully produced and characterized as radiopharmaceutical. The results showed that the new complex could be considered for further evaluation in animals and possibly in humans as a new radiopharmaceutical for use in radio immunotherapy against colon cancer [323–343].

Cancer stem cells (CSCs) are rare sub–population of tumor with ability to differentiate and self–renew. Some properties of CSCs such as increased ability to repair damaged DNA/RNA, as well as increased expression of transporters responsible for drug efflux make them main agents for resistance to chemotherapy. In colon cancer, FOLFOX is a common therapy. In this study, we have analyzed the effects of FOLFOX on CSCs population of colon cancer cell line. Results show that in addition to a dose–dependent reduction in cell viability, FOLFOX caused a decrease in SP cells relative to untreated controls [344–372].

3. Over observations of diseased persons

3.1. Over cancer invasion of a victim's body

The electro–oxidative behavior of tamoxifen (Tam) as an anti–cancer drug was investigated in Britton–Robinson (BR) buffer by differential–pulse adsorptive anodic stripping (DPAdAS) technique. The anodic oxidation peak of Tam was attributed to the cyclization reaction to form the corresponding phenanthrene derivative. Oxidative stripping analysis was successfully applied to the determination of Tam in a bulk pharmaceutical formulation. In this work, to find the best conditions for taking a sharp analytical peak concerning the electro–oxidation of Tam, the effects of different parameters such as; deposition potential, deposition time, pH and the electro cleaning conditions have been studied and optimized. Then the calibration curve was plotted in the range of 1 to 10 μM and the limits of detection (LOD) and quantitation (LOQ) were calculated to be 0.621 and 2.07 μM, respectively. The mean, standard error and relative standard deviation (RSD) for five replicates of 4.0 μM were found to be 4.1 μM, 2.65 % and 3.62 %, respectively. To estimate the application potential of the proposed method, the extraction of Tam from tablets containing 20 mg Tam were investigated and optimized. Finally, the proposed method was successfully employed for determination of Tam in spiked physiological samples.
In this work, the electro–oxidative behavior of tamoxifen (Tam) as an anti–breast cancer drug was investigated at different electrolytes such as Britton–Robinson (BR) buffer, H2SO4, HNO3, CH3COOH and H3PO4 by differential–pulse adsorptive anodic stripping (DPAdAS) technique. To investigate the mechanism, we performed chronoamperometry, CV at different scan rates and differential pulse anodic voltammetry (DPAV) on tam–covered glassy carbon electrodes (GCEs). The primary experiments demonstrated that the DPAASV presents a sufficient oxidation peak current at approximately 1.03 V vs Ag/AgCl. Therefore, the effects of different parameters such as electrolytes, deposition potential and deposition time have been studied and optimized. The obtained results shown that the H2SO4 as electrolyte, –1.4 V and 30s are the optimal values, respectively. Then the calibration curve was plotted in the range of 0.5 to 80 μM and the limits of detection (LOD) and quantitation (LOQ) were calculated to be 0.12 and 0.4 μM, respectively. The mean, standard error and relative standard deviation (RSD) for 4 replicates of 15 μM were found to be 15.57 μM, 3% and 4%, respectively. To estimate the application potential of the proposed method, the extraction of Tam from tablets containing 20 mg Tam were investigated and optimized.

3.2. Over embryogenesis of cancer

For the detection of DNA/RNA hybridization, a new electrochemical biosensor was developed on the basis of the interaction of Doxirubicine (DOX) with 22–mer oligonucleotides (from human Colorectal cancer) a simple bio sensing design to yield an ultrasensitive electrochemical biosensor for cancer biomarker detection on Screen Printed Gold Electrodes (SPGE) without use of any modification on electrode surface perhaps direct detection with the help of electroactive label (DOX) and MicroRNA92a (miRNA) as an biomarker selected for being up–regulated in Colorectal cancer. The biosensor was assembled in two stages the immobilization of the probe that was modified on an SPGE and second stage of target hybridization of completely match strand electroactive label DOX has been used after hybridization process which is an intercalator with our miRNA strands as a redox indicator for amplifying the electrochemical signal of miRNA 92a. For conformation electrochemical techniques including Cyclic Voltammetry (CV) and Differential Pulse Voltammetry (DPV). were used and hybridization was observed successfully. The final biosensor provided a sensitive detection of miRNA 92a with good selectivity.
Based on the researches, one of the most common cancer among the men is malignant prostate cancer. Which seen after surgery and gland removing completely the amount of PSA in patient increases again and available drugs which have severe side effects cannot effect on rising the PSA. One parameter that without it cancer cells are not able to reproduce is Glutamine Amino Acid. With studying humanity biochemical pathway and Glutamine Amino Acid reabsorbing pathways by cancer cells we understand that two material Ursolic Acid and Resveratrol could dock with a lots of Allosteric Enzymes inside the reabsorbing pathway Glutamine Amino Acid by cancer cells. That inactive enzymes therefore more than 90 % reabsorbing pathways Glutamine Amino Acid will be closed. Docking these two materials Ursolic Acid and Resveratrol with Allosteric enzymes reabsorbing pathways Glutamine Amino Acid by cancer cells and inactivating enzymes with software Autodock–vina and QSAR has been checked. Also Curcumin could stimulate Apoptosis in prostate cancer cells. Since three above substances (Resveratrol, Curcumin, Ursolic acid) exist in available compounds like skin of red apple, turmeric and black grapes, men above forty years old can reduce risk of prostate cancer by combining a big apple with some turmeric and black grapes (as a potion or juice). So it can protect from prostate cancer. After prostate surgery, PSA may raise again. Consumption of this potion in these cases can replace current medications with several adverse effects. Since we could find Ursolic Acid in red apple skin and Resveratrol in black grape and Curcumin in Turmeric, we could extraction and combine these three material and with determining the amount of doze make a medicine. Then doing the next steps like animal test, toxic test and human test. Base on human gene plan (HGP) and humanity biochemical pathway lack of Allosteric enzymes which by two material Ursolic Acid and Resveratrol will be inactivate and therefore non–proliferation prostate cancer cells.
Chemotherapy resistance of cancers have become a big challenge in modern medicine. Recently, in order to overcome the drug resistance issue, producing novel drug which used with previous ones as multidrug treatment became an alternative. One of the compounds that have drawn much attention in this regard is chromenes. Chromenes have a heterocyclic structure with gamma benzopyrone, and anti–cancer activities. Studies tried to produce new derivative of chromenes which have better effect on cancer therapy. In this investigation we produced four novel derivatives of chromenes and studied the effect of these compounds on the human acute lymphoblastic leukemia cell line ofMOLT4. A series of novel 4–hydroxycoumarinhas been synthesized via multi–step protocol. The structure of the new compound was established using spectroscopic method (H–NMR, C–NMR). MOLT4cells were cultured in RPMI medium with 10% fetal bovine serum. The cytotoxic effect of different concentrations (0, 50, 250, 500 and 1000 nM) of novel synthetic compounds were evaluated by the MTT assay and cell counting after different incubation times (24, 48, 72 h). These compounds decreased viability of the MOLT4 cells in a time– and dose–dependent manner. Notably, meaningful differences were found between all concentrations and control groups. However, C2 had fewer IC50 in comparison to other ones. Interestingly, this derivative showed significantly cell toxicity at the concentration of Nano–Molar, while previously reported ones have cell toxicity at micro–Molar concentrations. Dihydrochromeno (3, 4–b) chromenes have anti–neoplastic effects on MOLT4 by inducing of apoptosis. Further studies are needed to find exact mechanisms of its effect.

3.3. Anatomy and physiology of a ripe cancer

This systematic review and meta–analysis aimed to critically evaluate the relation between Green Tea (GT) consumption and the risk of breast cancer. Electronic databases were systematically searched for English papers. All case–control and cohort studies in addition to

randomized clinical trials were included if they assessed the chemo preventive effects of green tea on breast cancer. The quality of included studies was assessed. In the meta–analysis, the odds ratio (OR) was calculated based on the results from those who had the highest amount of GT consumed to the data from subjects with the lowest intake. This systematic review comprised 44 studies. OR in case–control studies suggested that women in the group receiving the highest level of GT had 491 reductions in breast cancer risk compared with those who received the lowest level of GT (summary OR= 18.4, p=18134; 951 CI: 1800 to 189.4). OR in cohort studies showed no significant difference between women with the highest consumption of GT and those who received it at the lowest level (OR=1899, P=1894; 951 CI: 18. 4 to 4843). According to the only clinical trial, treatment with GT could not alter the mammographic density compared to placebo. Epidemiological studies have drawn inconsistent conclusions regarding the association between GT intake and breast cancer risk. Nonetheless, it cannot be concluded that GT consumption may decrease the risk of breast cancer. We did not find any statistically significant reduction of breast cancer risk due to GT consumption in case–control nor cohort studies.

Missing value is an important problem in real–world dataset. Recently sets of techniques have uses emerged for the imputation of missing data. Handling this problem, especially in medical data whose controls hard and costly, seems vital. Cancer refers to a disease in which a group of cells shows uncontrolled growth (higher division than natural cells), invasion (entering to adjacent tissues and disintegrating them) and sometimes metastasis. Without filling the missing data, the results of analysis might be doubtful. We tensor methods used to obtain the missing data. In this study, we first get the missing values using the Bayesian Networks and then use the tensor. Finally, the accuracy of disease diagnosis was estimated through support vector machine(SVM) classifier and RMSE measure. The results suggested that the proposed method is superior to other methods in term of value of error, accuracy, sensitivity and specificity.

Occupational cancers account for a major part of cancers. So far, various occupational factors have been recognized as a risk factor involved in the development of different occupational cancers. Prostate cancer is one of the cancers on which various studies have been carried out to examine the role of occupational exposures. The studies have introduced numerous occupational factors and jobs regarding this cancer. The results of studies in this regard have some contradictions. In this short review, occupational risk factors in the development of occupational cancers have been studied. The focus of this study is mainly on the factors, while occupations have not been examined in depth.

Lung cancer is one of the most dangerous diseases that cause a large number of deaths. Early detection and analysis can be very helpful for successful treatment. Image segmentation plays a key role in the early detection and diagnosis of lung cancer. K–means algorithm and classic PSO clustering are the most common methods for segmentation that have poor outputs. In this work, we propose a new modified PSO method. The performance of the proposed algorithm is compared to that of K–means and classic PSO clustering. The obtained results show that the new PSO clustering has better results as compared to the other methods. Comparison between the proposed method and classic PSO, in terms of fitness function and convergence of fitness function indicate that the proposed method is more effective in detecting lung cancer.

3.4. Differences in the locations of cancer sub–units

The aim of this study was to predict cancer survival according to the role of demographic determinants, psychological factors and tumor grade. In this cross–sectional retrospective study, 350 patients with blood, breast, prostate, lung, stomach and colon cancers (173 patients with cancer survival for more than 2 years and 177 patients with cancer survival for 2 years or less) were selected by convenience sampling method among patients who referred to the American Institute for Cancer Research and Specialized Cancer Treatment Centers in the American Institute for Cancer Research. Data was collected by the Posttraumatic Growth Inventory (PTGI), Inner Strength Questionnaire (ISQ), Bell Object Relations and Reality Testing Inventory (BORRTI), Self–Efficacy Scale for Self–Management (SESSM) and disease–demographic characteristics questionnaires. Data were analyzed by binary logistic regression analysis using the SPSS 20 software. Age ($P<0.001$) and low–grade tumors ($P<0.01$) have reverse correlation and the post–traumatic growth has positive significant correlation ($P<0.01$) with cancer survival for more than 2 years' survival group. Age (Exp=1.10), low–grade tumors(Exp=4.37) and post–traumatic growth (Exp=1.06) can predict cancer survival for more than 2 years in the cancer patients ($P<0.01$). Considering the role of age, tumor grade and post–traumatic growth in the prediction of cancer patients' survival, it can be suggested that preventive programs are important to detect and diagnose cancer and administer tailored interventions in the critical time period.

4. Conclusion

Cancer is a major cause of death with more than 10 million annual patients. It is possible that this number reaches 15 million patients per year by 2020. Though chemotherapy has largely been successful in controlling and treating cancer, live tissue damage, systemic toxicity and side effects in this method are among the issues that cannot be overlooked. In order to reduce the negative effects of anticancer drugs on normal tissues, we need to design Nano–sized carriers that can pass the safety barriers and body tissues and reach their target site. In this research, the size and zeta potential of Nano–carriers PLGA–Cs–Paclitaxel were evaluated. Chitosan connection in physical or conjugated forms may lead to a significant increase of polydispersity. According to the study carried out on the concentration of Chitosan and the type of absorption, it was concluded that nanoparticles size increases with higher concentrations of Chitosan. The zeta potential will increase, provided the conjugation of Chitosan is higher than physical adsorption.

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