Genetic Research and Economic Analysis of Gene Variation Based on Medical Robot Promoting the Occurrence and Development of Esophageal Cancer

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Abstract: We try to use the Internet of Things project to detect the occurrence and development of esophageal cancer in combination with the marked population after gene mutation, and propose necessary solutions. At the same time, we propose necessary intelligent system strategies for computer vision recognition technology of esophageal cancer susceptibility genes, and propose a robot design idea with convolutional neural network model as the core, In this idea, the chromosome changes are identified after dyeing. The model of this assembly line is controlled by an automatic mechanism. The research team reported on the model design.

Keywords: Medical Robot; Gene Mutation; Esophageal Cancer; Genetic Mechanism; Economic Analysis

1. Background

The population distribution of esophageal cancer is related to age, gender, occupation, race, region, living environment, eating habits, genetic susceptibility, etc. The existing investigation data show that esophageal cancer may be caused by a variety of factors. The etiology has been proposed as follows, chemical etiology: nitrosamine. These compounds and their precursors are widely distributed, can be formed in vivo and in vitro, and have strong carcinogenicity. The nitrite content measured in the diet, drinking water, pickles and even the saliva of patients in the high incidence area is much higher than that in the low incidence area. Fungi with biological causes. A variety of fungi can be isolated from grains in some high incidence areas, upper digestive tract of patients with esophageal cancer or resected esophageal cancer specimens, some of which have carcinogenic effects. Some fungi can promote the formation of nitrosamines and their precursors, and further promote the occurrence of cancer Lack of some trace elements: molybdenum, iron, zinc, fluorine, selenium, etc. are low in grains, vegetables and drinking water Lack of vitamins, lack of vitamin A, vitamin B2, vitamin C, animal protein, fresh vegetables and fruits is a common feature of high incidence areas of esophageal cancer. Factors such as smoking, alcohol, hot food, hot drink, unclean mouth, etc., long-term drinking of strong liquor, addiction to smoking, hard food,

overheating, eating too fast, causing chronic irritation, inflammation, trauma or unclean mouth, dental caries, etc. may be related to the occurrence of esophageal cancer. Other genetic predisposing factors for esophageal cancer.[1][2][3][4]

1. Strategies for conscientious intervention of susceptible population using convolutional neural network

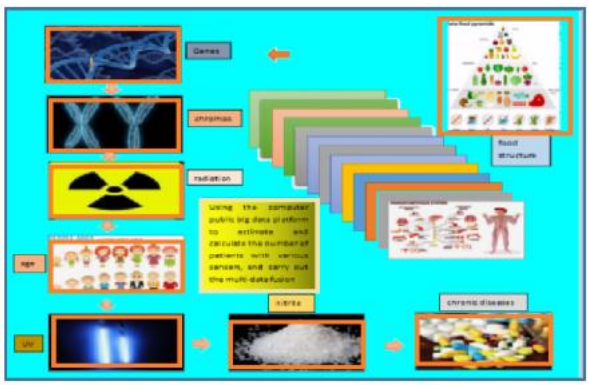

Figure1 Comparison of the common period and predisposing factors of esophageal cancer

Convolutional neural network is a kind of multilayer neural network, which is good at processing machine learning problems related to images, especially large images.

The most typical convolutional network is composed of convolutional layer, pooling layer and full connection layer. The convolution layer and pooling layer cooperate to form multiple convolution groups, extract features layer by layer, and finally complete classification through several full connection layers.

The operation completed by the convolution layer can be considered as inspired by the concept of local receptive field, while the pooling layer is mainly used to reduce the data dimension.To sum up, CNN simulates feature differentiation through convolution, and reduces the order of magnitude of network parameters through convolution weight sharing and pooling. Finally, it completes tasks such as classification through traditional neural networks.

After the chromosome is dyed, we can automatically recognize the report through scrolling and neural network. Therefore, especially in the aspect of susceptibility genes of esophageal cancer, this kind of program can be used as a medical robot to assist in clinical diagnosis.

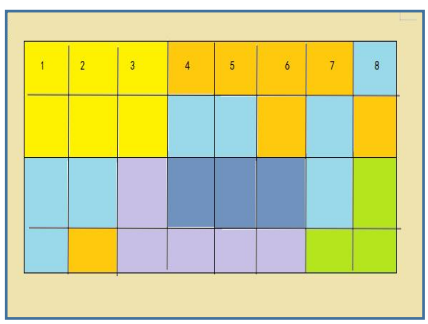

Figure 2 A model of neural network to identify gene

Convolutional neural network can identify mutated chromosomes by convolution and pooling, as shown in the grid distribution in Figure 2. Therefore, the development of this algorithm is very important.

2. Discussion

Precise treatment "is the most popular word in the medical field at present. As the name implies, it is to find the most accurate target, use the most effective treatment method, obtain the most effective treatment purpose, and minimize the side effects of treatment. The following principles are adopted: 1. Precise evaluation: whether the tumor evaluation is accurate is the key to determine whether the surgical resection is accurate and thorough, At present, we comprehensively use EUS (esophageal ultrasound) to scan tumor invasion, use CT to locate lymph node metastasis, and try to use puncture and PET methods to clarify if in doubt. In order to make tissue diagnosis as quickly, accurately and flexibly as possible, we have set up a small specimen diagnosis center, which can quickly diagnose EUS, EBUS, ultrasound puncture, endoscopic biopsy and other specimens in a one-stop manner. Therefore, you can get the most accurate and fast accurate diagnosis here. 2. Precision surgery: The so-called precision surgery is designed according to the possible invasion range of the lesion. If the tumor may have neck metastasis, we will use standard three field lymph node dissection. If the patient is only a submucosal invasion, and not a high-risk patient with lymph node metastasis, we will choose mediastinoscopy with minimal trauma to assist transesophageal resection. 3. Precise and minimally invasive: The definition of minimally invasive esophageal cancer is broad, and it does not simply refer to thoracoscopic esophagectomy. We extend it to endoscopic resection, thoracoscopic resection, and muscle preserving small incision resection of the chest wall. For specific patients, we do not insist on thoracoscopic surgery. The result we seek is to obtain the largest tumor resection and acceptable tissue trauma. 4. Precision nursing: In the esophageal surgery department of the chest hospital, our surgical nursing is based on precision. For each patient, we will have targeted pain, nutrition, and rehabilitation care, and a meticulous nursing and rehabilitation experience will be maximized.

3. Measure of medicine about gene-break

The occurrence of esophageal cancer must also involve gene mutation, because the cancer degree has repeatedly emphasized that if there is no gene mutation, there will be no tumor, no matter whether the mutation occurs at the DNA level, RNA level, epigenetic modification, protein expression level, etc. Without genetic changes, tumors will not occur. The genetic changes of esophageal cancer involve EGFR, HER2, c-MET, PIK3CA, AKT, etc. Some are mutations at the DNA level, and some are overexpression of proteins. Therefore, when detecting the genetic changes of esophageal cancer, sequencing technology and immunohistochemistry must be combined.[5][6]

4. Conclusion

The detection of susceptibility genes to esophageal cancer is very important at present. The concept of this core program of medical robots proposed by us is very consistent with the current needs of chromosome mutation recognition, which can solve the related needs, and is worth further research in the future.

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