

**REVIEW ARTICLE**

## A Comprehensive Review on Pancreatic Cancer

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### **ABSTRACT:**

Pancreatic cancer is characterized as a fatal disease where the healthy cells of the pancreas stops functioning and undergoes uncontrollable cell division. Three types of pancreatic tumors are in existence. They are pancreatic neuroendocrine tumor, pancreatic ductal adenocarcinoma and exocrine tumor. Pancreatic cancer stands in the 14<sup>th</sup> position in causing the most general cancer. In India, the pancreatic cancer incidence is measured at a low point i.e. (0.5-2.4 per 100000) in males and (0.2-1.8 per 100000) in females. Diabetes, smoking habit, excessive alcohol consumption for prolonged years, cholecystectomy, gastrectomy and low intake of fruits and vegetables are considered to be the major risk factors. Smoking termination will be the powerful action to decrease the opportunity of pancreatic cancer. Pancreatitis will lead to the pancreatic cancer. Pancreatitis and diabetes acts as a background disease in the pancreatic cancer. To diagnose pancreatic cancer, Computed Tomography, Magnetic Resonance Imaging technique acts as a first-line and second-line techniques respectively. Surgical treatment is the only treatment believed to be producing the potential cure, with the combination of chemotherapy. The medications prescribed as per USAD are Capecitabine, 5-Fluorouracil, Irinotecan, Leucovorin, Oxaliplatin, Nab-paclitaxel. Pancreatic cancer is recognized as life threatening disease in both developed and developing countries.

**KEYWORDS:** Pancreatic cancer, Surgical treatment, Endocrine tumor, Pancreatitis.

### **INTRODUCTION:**

Pancreatic cancer is characterized as a fatal disease where the healthy cells of the pancreas stops functioning and undergoes uncontrollable cell division. Detecting the pancreatic cancer in the early stages may avoid the surgery procedures. It is evident that family members such as first-degree relatives of the individuals will end up with malignant disease of pancreatic cancer. The pancreatic cancer occurrence and the mortality rate have been progressively increasing when it compared with the other disease. Only 4% of patients will survive up to 5 years even though when there is progression in finding and management of pancreatic cancer.<sup>(1)</sup> From all type of cancer, pancreatic cancer is considered to be in the 5<sup>th</sup> position in causing death across the globe.

Bioactive compounds The risk factor and causes of the pancreatitis differs with the age and gender. Pancreatitis may lead to the development of pancreatic cancer. The alcohol de-dependence and smoking termination may change the growth of the pancreatitis and may have the possibility of reoccurrence. Smoking termination will be the powerful action to decrease the opportunity of pancreatic cancer.<sup>(2)</sup> High number of pancreatic cancer patients go on asymptomatic upto the time of disease extends to the advance stage. Still now, there is no quality strategy to screen the pancreatic cancer. Pancreatic cancer has 4 primary driving genes they are KRAS, CDKN2A, TP53, and SMAD4.<sup>(3)</sup> The effective combined radiation and fluorouracil for pancreatic cancer is recommended by the members of gastrointestinal tumor study group.<sup>(4)</sup>

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### **TYPES:**

The organ pancreas is defined as a gland which is mainly consists of two types of cells such as endocrine cells and exocrine cells. These cells may probably progresses to

three main tumors. They are pancreatic neuroendocrine tumor, pancreatic ductal adenocarcinoma and exocrine tumor. Pancreatic neuroendocrine tumor emerges from the pancreatic endocrine part. And on the opposite side pancreatic exocrine neoplasm induce pancreatic ductal adenocarcinoma and acinar cell carcinoma. In the pancreatic cancer, pancreatic ductal adenocarcinoma is considered as the most general type. And this type of cancer causes the more death.<sup>(5)</sup> Another type of pancreatic cancer is IPMN (Intra-ductal papillary mucinous neoplasm). This IPMN type of cancer is generally diagnosed is most pancreatic cancer patients. IPMN-Intra-ductal papillary mucinous neoplasm will generally develop within the pancreas duct and produces mucin which is a thick fluid portion. This IPMN (Intra-ductal papillary mucinous neoplasm) is not cancerous at the beginning stage, if it is left untreated it gets developed into cancerous stage.<sup>(6)</sup>

#### **EPIDEMIOLOGY:**

Pancreatic cancer stands in the 14<sup>th</sup> position cancer. Based on the cancer mortality it stands in the 7<sup>th</sup> position. According to the Globocan database report, there is 458918 cases diagnosed and caused 432242 deaths in the world wide in the year 2018.<sup>(7)</sup> The pancreatic cancer's incidence rate differs from each countries. Europe and North American Population were highly affected when compared to other countries.<sup>(8)</sup> In India the pancreatic cancer incidence is measured at a low point i.e (0.5-2.4 per 100000) in males and (0.2-1.8 per 100000) in females.<sup>(9)</sup>

#### **RISK FACTORS:**

The smoking habit and low intake of fruits and vegetables are considered to be the major risk factor for development of carcinoma of the pancreas. Age is considered to be a well known risk factor.<sup>(10)</sup> Diabetes is also a risk factor probably which will lead to the tumor. Cholecystectomy and gastrectomy is also considered to be a possible risk factor.<sup>(11)</sup> According to research studies family history also favors the pancreatic cancer.<sup>(12)</sup> BRCA2 mutations can be seen as a risk factor in utmost cause Pancreatitis and diabetes acts as a background disease in the pancreatic cancer.<sup>(13)</sup>

#### **SIGNS AND SYMPTOMS:**

Pain, Anorexia, Early satiety, Xerostomia, sleeping problems and weight loss are considered to be the general symptoms.<sup>(14)</sup> The other symptoms are confidence interval, pale stools, Abdominal pain, Jaundice, unusual bleeding unusual bleeding, dark urine, constipation, Fatigue, unusual heart brain, altered ability to sleep, itching, Diarrhea.<sup>(15)(16)</sup>

#### **PATHOLOGY:**

Almost 60-70% of pancreatic adenocarcinoma emerge in the pancreas head region and remaining (15%) arise in the body portion and other (15%) found in the tail portion. When diagnosing pancreatic adenocarcinoma it has spreaded earlier beyond the pancreas.<sup>(17)</sup>

#### **PanIN:**

Pancreatic intraepithelial neoplasia plays a key role in the progression of local pancreatitis. In this local pancreatitis men has a chance of 1.5% and women has a chance of 1.3% chance of progressing from panIN to identifiable pancreatic adenocarcinoma in their life span.

#### **IPMN:**

Intraductal Papillary Mucinous Neoplasm (IPMN'S) is also well recognized precursor lesions for the pancreatic cancer. These IPMN'S are emerging from the one of the side branches of main pancreatic duct or it arises from the main duct of the pancreas.<sup>(18)</sup>

#### **DIAGNOSIS:**

The techniques involved in diagnosing pancreatic cancer are Computed Tomography and Magnetic Resonance Imaging technique. Computed Tomography acts as the primary line imaging method for diagnosing susceptible pancreatic cancer and Magnetic Resonance Imaging technique acts as the secondary technique. Computed Tomography is highly sensitive in detecting pancreatic cancer up to the range of 96% and Magnetic Resonance Imaging technique is sensitive up to the range of 93.5%.<sup>(19)</sup>

Endoscopic Ultrasonography, Endoscopic retrograde pancreatography, Angiography, Ultrasonography these techniques are also involved in diagnosing pancreatic cancer. In Endoscopic Ultrasonography, the lesions were detected accurately even when the lesion were below 20mm in diameter. In Ultrasonography technique, pancreatic cancer were easily identified when the tumor size is above 30mm, but it is quite complicated in tumor which is below 20mm in size.<sup>(20)</sup>

#### **TREATMENT:**

The surgical treatment is the only method for treating the pancreatic cancer and it is believed to be producing the potential cure, with the combination of the chemotherapy which will show slow improvement in the survival rate. The various treatment for managing the pancreatic cancer are surgical management and Medical management.<sup>(21)</sup>

#### **SURGICAL MANAGEMENT:**

The surgical management is only possible around one in fifth (20%) of the cases. It is more complicated to remove the tumor successfully from the pancreas.

Because the outer layer of the pancreas still containing the malignant cell which we can find in the CT scan, which it may help in the survival rate of the patients. The process of removing the cancer cell from the pancreas head is known as Pancreaticoduodenectomy.

The pancreaticoduodenectomy contains three stages which involves the removal of the cancer cell. The three stages are Exploration to asses for extra regional spread which is not identified on preoperative imaging where the cells are identified and the resection of the tumor is carried. The reconstruction of the pancreaticobiliary and intestinal tracts are done. These is the process which is done for the pancreaticoduodenectomy. According to the cancer cell, the surgical procedure is done, the various types of the surgical process are the Hemigastrectomy, Pylorus preserving, venous reconstruction.

If the cancer cells are spreads through the spleen and the pancreas the Distal pancreatectomy is used in this process, the spleen and the pancreas is removed and the reconstruction is done and the adjuvant therapy method is used.<sup>(22)</sup>

#### **MEDICAL MANAGEMENT:**

The Adjuvant Therapy indicates that there is decrease of the risk of low regional recurrence and the metastatic recurrence. These therapies are typically given to the patient for 1-2 months after the surgery because to allow the patients to get recover from the complex of the surgery. The drugs used for the treatment are based on the chemotherapy. Mostly Gemcitabine is used in combination with 5-FU(5-Fluro Uracil). These drugs are used for the recovery of the patients form the cancer cells. These drugs are prescribed to the patients for about 6 weeks after the surgery procedures.

#### **MEDICATION:**

The mentioned drugs are as per the USAD are Capecitabine, 5-fluorouracil, Irinotecan, Lencovorin, Oxaliplatin, Nab-paclitaxel.<sup>(23)</sup>

#### **CONCLUSION:**

Pancreatic cancer is considered as the most general disease in both developed and developing countries. Etiology is not understood clearly, still further more research are required for understanding the pancreatic cancer thereby it will be helpful in treating pancreatic cancer. However Genetic susceptibility acts as a main risk factor. PanIn, IPMN and MCN are considered as well-known precursors to the cancer of pancreas. Detecting the cancer patients with the lesions in the beginning stage it will avoid the unwanted surgery and also lowers the risk to the pancreatic cancer patients. In future, we can do research in finding the potent inhibitor of this pancreatic cancer.

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