Imaging Characteristics and Prevalence of Pancreatic Carcinoma in Kosovo During 2011-2015 - Diagnostic Method as Choice

Kreshnike Dedushi1,2, Serbeze Kabashi1,2, Sefedin Mucaj1,3, Gazmed Hasbahta2, Naser Ramadani1,3, and Astrit Hoxhaj4

1Faculty of Medicine, Pristine University, Pristine, Kosovo
2Department of Radiology, Diagnostic Centre, UCCK, Pristine, Kosovo
3National Institute of Public Health of Kosovo, Pristine, Kosovo
4American Hospital, Tirana, Albania

Corresponding author: Ass. Prof. Serbeze Kabashi, PhD. Faculty of Medicine, Pristine University, Department of Radiology, Diagnostic Centre, UCCK Kosovo. ORCID ID: http://orcid.org/0000-0002-3355-1621. Tel.: +377 44 225-554. E-mail: sebikabashi@gmail.com.


1. INTRODUCTION

Pancreatic cancer is the 10th most common malignancy and the 4th largest cancer killer in adults. Aim: The purpose of this paper is to evaluate the number of cases presented with pancreatic carcinoma during the years 2011-2015, our experience of the imaging characteristics of pancreatic carcinoma. We evaluated prevalence of the pancreatic cancers, distant metastases and other local infiltration signs among the total cases of the pancreatic cancers diagnosed in the University Clinical Center of Kosovo, with the aim to compare these research findings to similar studies made in the developed countries. This is a retrospective research study done during the period of 2011-2015.

Materials and Methodology: This retrospective research study includes 362 patients recently diagnosed with pancreatic cancer, examined in the period of 2011-2015 at the University Clinical Center of Kosovo. The imaging diagnostics are performed with MSCT Sensation 64 Siemens, MSCT Emotion 6 Siemens, and 1.5T MRI Symphony Siemens, biopsy guide with MSCT Sensation 64 Siemens in the Radiologic Clinic of UCCK; while the histopathology diagnostics has been performed in Clinic of Pathology at UCCK and prevalence is taken from the number of cases Reported at the Institute of Oncology Institute of Statistics and NIPH (National Institute of Public Health of Kosovo). Results: Out of a total of the 362 patients diagnosed with pancreas cancer, results is female 39.5% (n=143) and male 61.5% (n=219), report M: F (1: 1.6), 286 cases resulted in head and neck 79% (n=286), 76 cases resulted in body and tail cancers (21%), distant metastases in first imaging modality were found in (n=155) patients 43%, local infiltration was found in patients: gastric infiltration 15% (n=54), duodenal and papilla infiltration 26% (n=94), local infiltration spleen 16% (n=57), local infiltration mesentery 43% (n=155), dilated biliary tree 34% (n=123), regional lymph node infiltration 83% (n=300). Out of a total of the 362 patients diagnosed with pancreas cancer, 346 cases resulted > 2 cm and 16 cases resulted < 2 cm and with component cystic was 41.2% (n = 149), solid with component cystic – necrotic 33% (n= 119), solid 25.7% (n= 93). The prevalence is 19.9: 100,000 inhabitants.

Conclusions: Prevalence of carcinoma of the pancreas for 5 years in Kosovo has proved to be prevalence is 19.9: 100,000 inhabitants. Seventy-four percent (74%, n = 268) of all cancers are found in Stage III and IV. From an imaging point of view, these cancers were presented in an advanced stage, mainly due to their late clinical symptoms and limited access to imaging methods in our country.

Key words: Pancreatic Cancer, MSCT, MRI, Distant Metastasis, Local Infiltration, Prevalence, UCCK Pristina, Kosovo.
and vegetables intake), diabetes and alcohol intake. Chronic and hereditary pancreatitis: chronic pancreatitis is associated with a 5- to 15-fold increase in risk and hereditary pancreatitis with a 50- to 70-fold increase. Family history of pancreatic cancer. Familial cancer syndromes: BRCA1, BRCA2, familial adenomatous polyposis, Peutz-Jeghers syndrome, familial melanoma syndromes, Lynch syndrome, Von Hippel-Lindau syndrome, multiple endocrine neoplasia type 1, Gardner’s syndrome. Other medical conditions: inflammatory bowel disease, periodontal disease, peptic ulcer disease. All patients at increased risk of inherited pancreatic cancer should be referred to a specialist center for clinical advice and genetic counseling with appropriate genetic testing. 5-10% of pancreatic cancers are due to genetic alteration.

The accurate characterization of pancreatic neoplasm is very important for patient’s management. CT and MRI have become the most important modalities for evaluating pancreatic lesions. Precise diagnosis of pancreatic neoplasm is not always straightforward because they frequently show atypical imaging features and many other diseases may mimic pancreatic adenocarcinoma (6, 7). Pancreatic carcinoma is the fourth leading cause of cancer-related death in Kosovo. Pancreatic neoplasms have always been associated with a poor prognosis due to the late presentation, and hence, advanced stage of the disease at moment of the established diagnosis. Although this trend is gradually on the decline with the awareness of the existence of these disease, better radiologic imaging modalities for diagnosis in our country, diagnosis of this disease is still made in late stages and prognosis of disease is poor (8). Pancreatic carcinoma remains one of the deadliest cancers worldwide, and has a poor, five-year survival rate of 5%. Although complete surgical resection is the only curative therapy for pancreatic cancer, less than 20% of newly-diagnosed patients undergo surgical resection with a curative intent. Due to the lack of early symptoms and the tendency of pancreatic adenocarcinoma to invade adjacent structures or to metastasize at an early stage, many patients with pancreatic cancer already have advanced disease at the time of their diagnosis and, therefore, there is a high mortality rate (9). The estimated lifetime risk of developing pancreatic cancer is about 1 in 71 (1.41%) (10). The disease is rare before age 45 but incidence rises rapidly after that and peaks in the seventh decade of life. The major risk factors include smoking (11), hereditary predisposition to pancreatic cancer itself or to multiple cancers (12) and to a lesser degree, chronic pancreatitis (13). Pancreatic cancer does not exhibit early symptoms and initial symptoms are often nonspecific. Classical presentation of pancreatic cancer is present in only 13-18% of the patients and is often accompanied by purities, alcoholic stools, dark urine and weight loss (14). Abdominal pain is present in 80-85% of patients with locally advanced or advanced disease. Acute pancreatitis and new onset diabetes mellitus can often be the initial presentations of PC (15, 16). In up to 75% of the cases, the tumor is located within pancreatic head mostly sparing the uncinated process. Tumors in the pancreatic head often present early with biliary obstruction. However, tumors in the body and tail can remain asymptomatic till late in disease stage. Imaging techniques currently used for diagnosis and preoperative staging of pancreatic cancer include abdominal ultrasound (US), contrast-enhanced computed tomography (CT), magnetic resonance imaging (MRI), MR cholangiopancreatography (MRCP) and invasive imaging modalities like endoscopic retrograde cholangiopancreatography (ERCP) and endoscopic ultrasound (EUS). With the continuing substantial improvements in CT technology, the capacity of MDCT for the detection, diagnosis, and local staging of pancreatic cancer has increased. MDCT is very effective for detecting and staging adenocarcinoma, with a sensitivity of up to 90% for detection and an accuracy of 80%-90% for staging (17, 18). Determination of the extent of vascular involvement is usually made by identifying the extent to which the tumor involves the cross-sectional circumference of a vessel.

2. AIMS

The aim of this paper is to evaluate the number of cases presented with pancreatic carcinoma during the years 2011-2015, our experience of the imaging characteristics of pancreatic carcinoma. We evaluated prevalence of the pancreatic cancers, distant metastases and other local infiltration signs among the total cases of the pancreatic cancers diagnosed in the University Clinical Center of Kosovo, with the aim to compare these research findings to similar studies made in the developed countries. This is a retrospective research study done during the period of 2011-2015.

3. MATERIAL AND METHODS

This retrospective research study includes 362 patients first time diagnosed with pancreatic cancer, examined in the period form 2011-2015 in the Clinic of Radiology at University Clinical Center of Kosovo. Only patients that were first time diagnosed with pancreatic neoplasm were included and evaluated in this research. Abdominal ultrasound, MSCT 64 slice Sensation and MSCT 6 slice Emotion were used for CT examination of patients. MRI images are obtained with MRI 1 5T Symphony and core guide biopsy with CT.

Abdominal ultrasound (US) is widely available, noninvasive, relatively inexpensive imaging modality without contrast associated adverse effects. It is usually performed to rule out cholelithiasis and look for biliary dilation in patients who present with jaundice and abdominal pain. The real world accuracy of conventional US for diagnosing pancreatic tumors is 50 to 70%. The results of US are highly operator dependent. Computerized tomography (CT) is the initial comprehensive imaging done in patients with suspected pancreatic cancer. Use of non-contrast CT to evaluate pancreas is limited to patients with renal failure or allergic reactions to iodinated contrast agent used. As the pancreatic tumors are hypo vascular and can be visualized only with contrast imaging, non-contrast CT scans have poor sensitivity and specificity for pancreatic tumors and hence cannot be relied on to make a diagnosis.

CT with Intravenous (IV) Contrast Multi detector CT (MDCT) provides very thin slice cuts, higher image resolution and faster image acquisition. Contrast enhanced MDCT can be used to evaluate local extension, invasion of adjacent vascular structures and surgical resectability with an accuracy of 80 to 90%. However for pre-operative staging, it is limited in detecting liver metastases and early lymph node metastasis. The absolute contra-indications of contrast CT
are in patients with renal failure and contrast allergy.

Magnetic resonance imaging (MRI) can be used in imaging for pancreatic cancer in patients with equivocal findings at ultrasound or MDCT. MRI examination of the pancreas is done with intravenous administration of contrast material and gadolinium is the most commonly used agent. Pancreatic cancer is hypo intense on gadolinium-enhanced T1-weighted images in the pancreatic and venous phases. However, it is hypo vascular with abundant fibrous stroma compared to the pancreatic parenchyma. Tumors appear iso- intense on delayed images because of slow wash-in of contrast medium. MRI is commonly used to detect pancreatic cancer when a mass lesion is not identifiable on CT scan. There is however no significant diagnostic advantage of MRI over contrast-enhanced CT (sensitivity of 86% on CT vs. 84% on MRI).

Magnetic resonance cholangiopancreatography (MRCP) is a useful adjunct to other radiographic diagnostic techniques and may emerge as the preoperative imaging procedure of choice for patients with suspected pancreatic cancer. MRCP uses magnetic resonance technology to create a three dimensional image of the pancreatic biliary tree, liver parenchyma, and vascular structures. MRCP is better than CT for defining the anatomy of the biliary tree and pancreatic duct, has the capability to evaluate the bile ducts both above and below a stricture, and can also identify intrahepatic mass lesions. It is reported as sensitive as ERCP in detecting pancreatic cancers and unlike conventional ERCP, does not require contrast material to be administered into the ductal system.

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5. DISCUSSION

Incidence of pancreatic carcinoma in Kosovo is increasing, but according to world-wide data it is reaching the incidence of developed countries. This is explained by utilization of advanced imaging modalities in routine examination of patients with complaints suspected for pancreatic disease. According to our studies, the M/F ratio is 1: 1.6 (223/139) that is not different from similar studies done in European countries (M/F ratio is 1.6:1) (19). The results obtained in Balkan coun-

Figure 3. CE MRI of upper abdomen axial plane (a, b, d), tumoral mass lesion body part of pancreas, one satellite lesion is noted laterally in body part, invasion beyond pancreatic capsule, especially posterior-inferiorly and anteriorly. There is impression for splenic vein encasement. Metastases in liver.

Figure 4. CE MRI of upper abdomen axial plane (a, b, d), tumoral mass lesion head of pancreas extracapsular. MRCP (d) dilatation of the bile ductus pronounced proximal intrahepatic and liver. DCB obstruction distal level.
for staging, were done and diagnosed with the use of MDCT (24). Despite different difficulties in diagnosis and treatment of PC in Kosovo, the statistics of survival rates are similar with statistics in European countries. Survival time in Kosovo is 3–16 months (after 4 years there are only 52 (14.4%) patient still alive – out of 362 that were diagnosed during the period 2011–2015).

6. CONCLUSION

MDCT is the preferred initial imaging modality in patients with clinical suspicion for pancreatic cancer with 90% specificity and 90% sensitivity. Special emphasis is given to the impact of multi detector CT and post processing imaging techniques on the staging (almost 100%) of pancreatic adenocarcinoma. The MRI was used for further differentiation of mixed tumors (high sensitivity for cystic component) interchangeably with MRCP that helped in differentiating of PC from chronic pancreatitis. It is understandable that the most accurate diagnosis were obtained after percutaneous core biopsy. The combination of different diagnostic imaging methods along with multiple laboratory analysis and multidisciplinary clinical cooperation was the preferred method for accurate and early diagnosis of PC. We recommend this type of clinical work in order to have best possible results.

7. REFERENCES

10. American Cancer Society. What are the key statistics about