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# THE FREQUENCY OF RISK FACTORS ON TRENDS OF PANCREATIC CANCER IN KOSOVO

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## ABSTRACT

**The aim:** The aim of this paper is to analyze different factors that influence the trends of pancreatic cancer mortality and morbidity of patients treated at the UCCK of Kosovo. Within this study, we have evaluated pancreatic cancer risk factors, durability and lethality regarding Kosovan patients who have been diagnosed and treated within Kosovo. The study in question is that of retrospective research traversing the period of 2011-2015. **Materials and methodology:** This retrospective research study includes 362 patients recently diagnosed with pancreatic cancer, 2011-2015 at the University Clinical Center of Kosovo in Pristina. The main important factors included in this study are: age, sex and risk factors that altogether have considerable influence in incidence of pancreatic cancer. The imaging diagnostics are performed with the use of 2D ECHO Phillips, MSCT Sensation 64 and 6 and 1.5T MRI Symphony Siemens that are situated in the Radiologic Clinic of UCCK. The statistic data were obtained from NIPH of Kosovo and Agency of Statistics of Kosovo. **Results:** Out of the total number of the 362 patients diagnosed with pancreatic cancer, the mortality in all age groups was higher at male patients—61.6 % of cases (n=223) with the highest number found at 51–60 years age group. The 38.4 % (n= 139) were female patients with the highest incidence frequency at F 61–70 years age group. The F/M ratio is 1:1.6. The “plane” nicotine users were found at 34 % (n=123) while the joined, nicotine/alcohol addiction was detected at 26 % (n= 94). The 18.5% (n=67) have had established diagnose of the diabetes mellitus tip II and 9.6 % (n=35) have undergone the medical treatment of the gastroduodenal peptic ulcerations. The total number of deaths is 310 (85.6%) and there are only 52 patients (14.4%) still alive. The mortality rate of the pancreatic cancer in Kosovo was 17.2 in 100.000 residents while the morbidity rate was 2.8 in 100.000 residents. **Discussion and conclusion:** This retrospective research study intends to present the role of the risk factor, that influence the mortality and morbidity of the pancreatic cancer in Kosovo and finally, to compare these results with similar studies abroad with aim to prevent the pancreatic cancer. The analyses of the obtained statistical data shows that the nicotine addiction play important role in incidence of the pancreatic cancer as well as alcohol addiction, presence of the diseases such are diabetes mellitus tip II and gastroduodenal peptic ulcers.

**Key words:** Pancreatic Cancer risk Factors, Mortality and Morbidity, MSCT, MRI, UCCK of Kosovo.

## 1. INTRODUCTION

The pancreatic cancer is a disease with exponentially increased incidence, especially over the last decades, being the sixth or even fifth cause of death by cancer in most of the modern societies (1). Although pancreatic cancer is the eleventh most prevalent cancer in the US, it is predicted that of all of the patients newly diagnosed with this disease in 2015, only 27% will still be alive at the end of the first year and only 6% will survive after 5 years (2). According

to recent studies pancreatic cancer has a negative outlook in both sexes, rising 4% in men and 5% in women between 2009 and 2015 (our study showed that even both sexes were attacked, the significantly higher prevalence was registered at the male population rationing values of 1:1.6 (3). Most of the patients have been for the first time visited by medical staff at the advanced phases of the disease. Both genetic and environmental factors may be playing significant role in this disease (4). International incidence rates vary in different

countries, implying that environmental factors are important. Of these factors, a known cause of pancreatic cancer is tobacco smoking explaining about 25% of all cases that is the same case as in our research. Furthermore, this habit (or addiction) is still popular in Kosovo's population despite the permanent antismoking activities undertaken by local medical institutions and the international ones. The recent law regulations that prohibit the use of the cigarettes in public premises (including restaurants and other similar places) still did not show significant results especially among male population that represents 32.2 % of smokers (5, 6). Smoking is an established risk factor for pancreatic cancer; however, detailed examination of the association of smoking intensity, smoking duration, and cumulative smoking dose with pancreatic cancer is limited (7). Alcohol is another risk factor associated with pancreatic cancer in all countries. The statistic data obtained in Kosovo show that the percentage of the alcohol users among the overall number of patients included in our study is 26 %. The lower percentage of alcohol users if compares with the studies done in European countries is probably a result of predominantly traditional "old fashioned" way of living, the trend that is constantly changing nowadays. In our study were included older patients with lower percentage of alcohol users and higher percentage of nicotine users, especially among male population. The female population included in our study has lower use of both, nicotine and alcohol (comparing to the other countries). The younger population in Kosovo, even still not confronted in significant percentage by pancreatic cancer due to their age, will probably have more accentuated alcohol and nicotine risk factors in older age if attacked by pancreatic cancer (as a result of more intensive use of these substances). Another important risk factor associated with pancreatic cancer appears to be a diet. A high intake of fat, meat or both has been linked to the development of this neoplasm (8, 9, 10). Our study also showed the similar results that were associated with the even lower use of the vegetables and other articles that belong to "healthy food". Diabetes mellitus associated with pancreatic cancer was noticed in our study as well representing 18.5 % of total number of the patients. Pancreatic cancer incidence is strongly related to age, with the incidence rate being higher in older man and women (11). Our study showed that pancreatic cancer attacks different age groups but predominates in older population (51-60 years age group at male patients and 61-70 years age group at females). The ratio is 1:1.6 (the male patients were more attacked) that is considerably higher value comparing it with some other studies that resulted with 1:1.3 ratio (12, 13).

**2. AIMS**

The aim of this paper is to analyze different factors that influence the trends of pancreatic cancer mortality and morbidity of patients treated at the UCCK of Kosovo. Within this study, we have evaluated pancreatic cancer risk factors, durability and lethality regarding Kosovan patients who have been diagnosed and treated within Kosovo. The study in question is that of retrospective research traversing the period of 2011-2015.

**3. MATERIAL AND METHODS**

The anamnestic data were obtained from the patients followed by analytic studies that included factors as: age, gender, associated diseases, genetic factors, lab analysis (included Tumor markers such is Ca19.9) and vital indicators including morbidity and mortality. This retrospective research study includes 362 patients recently diagnosed with pancreatic cancer, 2011-2015 at the UCCK. The main important factors included in this study are: age, sex and risk factors that altogether have considerable influence in incidence of pancreatic cancer. The imaging diagnostics are performed with the use of 2D ECHO Phillips, MSCT Sensation 64 and 6 and 1.5T MRI Symphony Siemens that are situated in the Radiologic Clinic of UCCK. The statistic data were obtained from NIPH of Kosovo and Agency of Statistics of Kosovo.

**4. RESULTS**

Out of a total of the 362 patients diagnosed with pancreas cancer, 228 cases resulted in head and neck localization 75.7 % (n=274), 88 cases resulted in body and tail cancers 24.3% (n=88) (Table 1).

Carcinoma of pancreas		N (%)
Head and neck	Body and tail cancers	
75.7 % (n= 274)	24.3 % (n=88)	100.0% (n= 362)

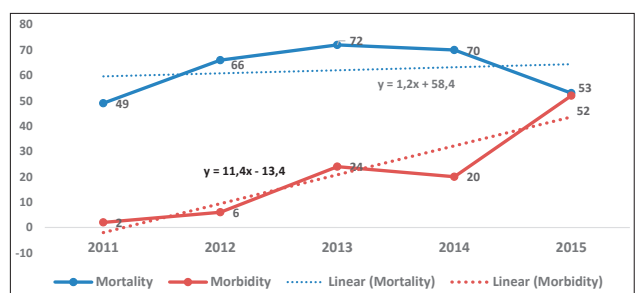
Table 1. Localization of Pancreatic cancer

Retrospective analysis of 362 patients showed that 223 of them were male patients 61.6% (n=223) mostly gathered at predominant 51-60 years age group while female patients 139 of them 38.4 % (n=139) were mostly present at 61-70 years age group. Among total number of patients studied during period 2011-2015, the nicotine users were found at 34 % of cases (n=123) while the joined, alcohol addiction was detected at 26% of cases ( n= 94). Out of the total number of the 289 patients, 2011-2015 the 18.5 % of cases (n=67) have had established diagnose of the diabetes mellitus tip II.

The medical history of the 9.6 % of patients (n=35) showed previous suffering of gastroduodenal peptic ulcerations (Table 2). The total number of deaths during the period 2011 -2015 is 310 (85.6%-n=310) and there are only 52 patient

Smoking	Alcohol	Diabetes tip II	Peptic ulcer	Other	N(%)
34% (n=123)	26% (n=94)	18.5% (n=67)	9.6% (n=35)	24.3% (n=88)	362 (100%)

Table 2. Number of patient's smoker, alcoholic, and diabetes tip II and peptic ulcer.



Graph 1. The progress of the linear trend (mortality) over the years shows increasing tendency

Years	The dead		Total N	Mortality (1:100.000)	Still lives		Total N	Morbidity (1:100.000)
	m	f			m	f		
2011	31	18	49	2.7	-	-	-	-
2012	41	25	66	3.6	1	1	2	0.1
2013	44	28	72	4	4	2	6	0.3
2014	46	24	70	3.8	16	8	24	1.3
2015	39	14	53	2.9	14	6	20	1.1
Total	201	109	310	17.0	35	17	52	2.8

Table 3. The total number of dead and those who still live (mortality and morbidity). No. of residents: 1820631

(14.4%) still alive (n=52). The number of the survived patients divided by years differs according to the duration of the disease. Out of the total number of the 362 newly diagnosed patients during the period 2011-2015 in Kosovo, there are 22.9 % (n=66) diagnosed at 2011, 23.5 % (n=68) diagnosed at 2012, 26.6 % (n=77) diagnosed at 2013 , 27 % (n=78 ) diagnosed at 2014 and 20.2% (n=73 ) diagnosed at 2015. The overall mortality rate of pancreatic cancer in Kosovo registered during the research period 2011-2015 was 17.0 in 10000 residents that represents the sum of rates of the particular years such are; year 2011 - 2, 7 in 100.000 residents, year 2012 - 3.6 in 100.000 residents, year 2013 - 4.0 in 100.000 residents, year 2014 - 3.8 in 100.000 residents and year 2015 - 2.9 in 100.000 residents. The morbidity rate registered during 2011-2015 (no.362 total of patients) research period was 2.8 diseased patients still lives in 100.000 residents (Table 3).

### 5. DISCUSSION

Having in consideration the cancer’s very high mortality, an important part of the strategy that aims to minimize its burden is to understand the importance of causes of the disease, and if possible to reduce exposure to known risk factors. High priority should be given to the efforts that control smoking and alcohol use. Smoking is the strongest environmental risk factor known to cause pancreatic cancer. Carcinogens derived from tobacco smoke probably reach the pancreas via the bloodstream after being absorbed from the lungs or from the upper aero digestive tract. In addition, there is a possibility that ingested tobacco products reach the pancreas directly after reflux into the pancreatic ductal system from the duodenum. If this mode of exposure is correct, it could partly explain the large number of pancreatic cancers that occur in the head of the pancreas. Nearly all published reports show that exposure to tobacco products increases the risk of pancreatic cancer, usually with about a 2-fold increased risk, compared to non-smokers (14, 15). The exposure to the other risk factors (alcohol, diabetes mellitus tip II, high calories diet etc) during last period is increased among the Kosovo’s population (according to recent epidemiologic studies). The gathering of anamnestic data related to the particular fields of the disease was difficult process at considerable number of the patients due to their low level of health education. The number of nicotine addicted individuals in Kosovo is much higher than in other countries (especially comparing with western European countries). But this fact did not implicate the higher incidence of the newly discovered pancreatic cancers in Kosovo and this known risk factor could not be treated as the main cause

of the disease in our study (16). In contrary to the nicotine addiction, the alcohol consumption in Kosovo is lower than in developed European countries. Similar to the above mentioned relation of the number of the individuals nicotine addicted and incidence of the pancreatic cancer, we again could not find significantly changed incidence of the newly discovered pancreatic cancers that were used alcohol (comparing to the other countries). Diabetes mellitus was noticed in our study as a risk factor as well (based in our and other countries’ statistics). The genetic factor - as very important one regarding the incidence of the pancreatic cancer was not studied in proper way in Kosovo due to the lack of the modern laboratories and Public Health Institutions that gather and processes information in this particular field of medicine. Another, (rare in these days in Europe) potentially serious risk factor, is the impact of higher level of radioactive uranium that was part of the bombs that were used during the NATO bombing attacks in Kosovo during 1999-2000. There is still not any serious and comprehensive medical study regarding this issue due to different military and institutional limitations. As results, there is increased number of different diseases in Kosovo, still counting the cardio-vascular disturbances as a main cause of death followed by neoplastic malignant diseases. The pancreatic cancer itself is the fourth etiologic factor of death caused by gastrointestinal diseases in both gender groups—51-60 male age group and 61-70 female age group (1.6:1 ratio) (17, 18). This study described pancreatic cancer mortality trends for Kosovo population in 5 years, and findings show an increasing trend in both sex and most age groups. Age standardized studies of pancreatic cancer in Kosovo’s population during the period of 2011-2015 showed the total rate of 14.1 in 10000 residents that represents the sum of rates of the particular years such are; year 2011 - 2.7 in 100.000 residents, year 2012 - 3.6 in 100.000 residents, year 2013 - 4.0 in 100.000 residents, year 2014 - 3.8 in 100.000 residents and year 2015 - 2.9 in 100.000 residents (Table 3). Similar studies were done in different countries and the highest mortality rate in men was reported in Hungarian - 11.56 per 100.000, followed by Armenia 10.81, Albania 10.7, Croatia 9.47, Russia 8.83, Finland 7.14, per 100.000 and Czech Republic 7.13. The lowest mortality rates were found in Cyprus and Turkey, both in men (3.69 - 3.72 per 100.000) respectively women (2.43 and 2.49 per 100.000) (19). Compared with the other European countries and USA with higher incidence frequency, the mortality rate registered in Kosovo during 2011-2015 was 2.7 - 3.8 in 100.000 residents. Since diagnostic and treatment improvements in the last decades have not substantially influenced the survival rate of pancreatic cancer, the rise of mortality rate in Kosovo follows the higher incidence rate due to improvement of diagnostic methods. International differences in mortality rates and temporal trends suggest that etiology of pancreatic cancer is influenced by environmental factors, especially smoking, but also by nutritional and dietary factors, obesity, alcohol use, diabetes mellitus, and peptic ulcerations (20, 21).

### 6. CONCLUSION

This retrospective research study is to present the role of the risk factors, that influence the mortality and morbidity

of the pancreatic cancer in Kosovo and finally, to compare these results with similar studies abroad with aim to prevent the pancreatic cancer. The analyses of the obtained statistical data shows that the nicotine addiction play important role in incidence of the pancreatic cancer as well as alcohol addiction, presence of the diseases such are diabetes mellitus tip II and gastroduodenal peptic ulcers. This study confirmed that the number of newly diagnosed patients with pancreatic cancer in Kosovo is higher than the number of patients registered in previous periods. The important impact has definitely higher and more comprehensive institutional engagement as well as usage of the modern diagnostic apparatuses and well educated professional staff. It is not to forgotten the potential role of the higher level of uranium as mentioned in previous text. Even with increased incidence, the morbidity rate found in recent period is still lower in Kosovo compared with the morbidity rates resulted at the similar studies done in European countries. Increased incidence of pancreatic cancer remains the biggest problem regarding this issue. Furthermore, there is evident progressive trend that is not stopping and this fact requires employment of different preventive methods that are supposed to be undertaken by relevant health and other public institutions. This study, among other intentions, has been also dedicated to present current problems to this “decision making” institutions and to remind them that only the comprehensive, multidisciplinary and multi-institutional approach will have success in permanent fight against cancer. Regarding actions that have been undertaken in order to decrease the use of nicotine, there are only few judicial regulations that prohibit smoking in restaurants and in all public institutions. There is no any other institutional, well studied and long-standing preventive approach regarding this problem. Neoplastic malignant diseases are the second group of the diseases that causes death in Kosovo’s population. The pancreatic cancer itself is the fourth etiologic factor of deaths caused by gastrointestinal diseases in both gender groups—51–60 male age group and 61-70 female age group. The F/M ratio is (1:1.6). The increased morbidity and mortality rate is noticed in both gender groups. The already known risk factors are also confirmed in this study, The differences that characterize this study comparing with European researches are the higher rate of nicotine users and the lower rate of the alcohol users especially among male population with pancreatic cancer (even this fact did not have significant impact in the incidence) Since diagnostic and treatment improvements in the last decades have not substantially influenced the survival rate of pancreatic cancer, the reduced exposure to the risk factors would be the preferable strategy that will probably decrease the number of the new cases.

- Author’s contribution: Naser Ramadanani has create the main research and design study (<http://orcid.org/0000-0001-8817-4002>), SM participated in design of the study and performed the statistical analysis, KD and SK have contributed in all phases if it’s preparing. AH compared the results with other publications, and NJ drafted manuscript and participate in additional correction and design. All authors have read and approved the final manuscript.
- Conflict of interest: none declared.

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