



Surgery

CORRELATION BETWEEN INCIDENCE OF PANCREATIC CANCER WITH DIABETES MELLITUS AT HAJI ADAM MALIK MEDAN GENERAL HOSPITAL

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KEYWORDS :

INTRODUCTION

Pancreatic cancer is the growth of uncontrolled abnormal cells that develop in the pancreas (Cancer Council, 2016). Pancreatic cancer is one of the deadliest cancers in the world, there are 330,000 deaths from pancreatic cancer in 2012, and because of its very high mortality rate, pancreatic cancer is the seventh most common cancer cause in the world, with a 5-year survival rate of 5%.

Pancreatic cancer is difficult to diagnose, especially in the early stages, making management difficult (Edge et al., 2010). The cause of pancreatic cancer is still less well known, although certain risk factors have been identified. People are at high risk with one of the risk factors such as smoking, obesity, genetics, diabetes, diet and activity (Parkin et al., 2011; Willett, 2000; Bosetti et al., 2012; Anand et al., 2008).

Cohort studies and control cases of DM and Pancreatic Cancer suggest a positive relationship between diabetes and pancreatic cancer. overall risk of malignancy was higher in the group with fasting glucose > 140 mg / dL compared with fasting serum glucose < 90 mg / dL, and strongest link to pancreatic cancer. The volume of pancreas was significantly reduced by about 20% in patients with DM compared with controls, and pancreatic cell area. There was an increase of about 10 times the number of acinar cells that failed to have apoptosis. This suggests that the damage to the pancreas is very specific to the exocrine compartment and affects the endocrine island to a lesser extent.

Based on the description above, researchers are interested to know the relationship of DM patients with the incidence of pancreatic cancer in Haji Adam Malik Medan Medan in 2012 - 2017.

METHODS

This is a case-control study with data sources from medical records. The sample of the study was pancreatic cancer patients who suffered from DM or not DM and did not suffer from pancreatic cancer who suffered DM or not DM in RSUP H. Adam Malik Medan from 2012-2017 which fulfilled inclusion and exclusion criteria.

Inclusion Criteria:

1. Patients with complete patient characteristics data (age, sex).
2. Patients with complete laboratory results (KGD).
3. Patients who have radiological results (CT-scan abdomen with contrast) and tumor marker (Ca 19-9).

Exclusion Criteria:

1. Pancreatic Cancer Patients with dissertations of other metabolic abnormalities

Collected data was processed and analyzed using Chi-Square test and by using computer program (SPSS) with 95% confidence interval and $p < 0,05$ was statistically significant.

RESULTS

In this study, there were 44 patients with pancreatic cancer who had DM or no DM and 56 people who did not suffer from pancreatic cancer

who had DM or no DM in RSUP H. Adam Malik Medan from 2012-2017 who fulfilled inclusion and exclusion criteria. Characteristics of the study sample are seen in Table 1.

Table 1. Sample's Characteristics

| Characteristics | n | % |
|-----------------------------|-----|------|
| Sex | | |
| Male | 49 | 49 |
| Female | 51 | 51 |
| Age | | |
| < 30 years old | 3 | 3,0 |
| 30-40 years old | 6 | 6,0 |
| 41-50 years old | 20 | 20,0 |
| 51-60 years old | 50 | 50,0 |
| 60-70 years old | 17 | 17,0 |
| ≥71 years old | 4 | 4,0 |
| Status of Pancreatic Cancer | | |
| Yes | 44 | 44,0 |
| No | 56 | 56,0 |
| Status of DM | | |
| Yes | 31 | 31 |
| No | 69 | 69 |
| Total | 100 | 100 |

Based on the above table found the distribution ratio between male and female sample is almost the same, where more women with the sample number 51 people (51,0%), with age group 51-60 years is the most group in this research (50 %) patients, as many as 44 patients (44%) had pancreatic cancer, and 69 (69%) of patients did not in diabetic mellitus status.

Table 2. Sample Distribution according to Status of Pancreatic Cancer

| Variables | Pancreatic Ca n(%) | Non Pancreatic Ca n(%) | p-Value |
|-----------|--------------------|------------------------|---------|
| Gender | | | 0.107 |
| Male | 26 (59.0) | 23 (41.0) | |
| Female | 18 (41.0) | 33 (59.0) | |
| Age | | | 0.061 |
| < 30 | 3 (6.8) | 0 (0.0) | |
| 30-40 | 3 (6.8) | 3 (5.4) | |
| 41-50 | 10 (22.7) | 10 (17.9) | |
| 51-60 | 22 (50.0) | 28 (50.0) | |
| 61-70 | 3 (6.8) | 14 (25.0) | |
| ≥71 | 3 (6.8) | 1 (1.8) | |
| DM Status | | | |
| DM (+) | 6 (13.6) | 25 (44.6) | |
| DM (-) | 38 (86.4) | 31 (54.4) | |

Based on table 2 above, the percentage of males in pancreatic Ca is equal to the percentage of women in non pancreatic ca as much as 59%. The 51 to 60 age group is the most common age group in both groups, each 50%. Followed by the age group 41 to 50 years with a percentage of 22.7% each in the ca pancreas group and 17.9% in the non-ca

pancreatic group. Statistical analysis using chi square showed no correlation between incidence of pancreatic Ca with sex ($p = 0,107$) and age group (0.061).

Table 3. Distribution Sampel of Pancreatic Cancer Status According to DM

| Status of DM | Pankreatic Cancer | | P value |
|--------------|-------------------|-------------------|---------|
| | Pancreatic Ca | Non Pancreatic Ca | |
| DM (+) | 6 | 25 | 0,001 |
| DM (-) | 38 | 31 | |
| TOTAL | 44 | 56 | |

OR = 0,196
CI 95% = 0,07–0,5

Statistical analysis using chi square test showed that there was correlation between incidence of pancreatic Ca and DM ($p = 0,001$). The results of the odds ratio measurement showed that DM was a protective factor for the incidence of pancreatic Ca (95% CI = 0.07-0.5).

DISCUSSION

The majority of pancreatic cancer is a localized exocrine tumor in the region of caput, where adenocarcinoma is 95% of all (Sata et al, 2009). Risk factors for this malignancy include family history, smoking, obesity, chronic pancreatitis, and diabetes mellitus. Epidemiological data identify diabetes as a risk factor for various forms of malignancy, including pancreatic cancer (Huxley et al, 2005). The results of this study indicate that DM is a protective factor of the incidence of pancreatic cancer ($p = 0.001$, OR = OR = 0.196, 95% CI = 0.07-0.5).

In this study there was no relationship between sex and age on the incidence of Ca Pancreas. This is in line with previous research conducted by Wheeler and Nicholl in 2014 who studied 309 patients with pancreatic cancer. In the study there was no significant relationship between sexes on pancreatic cancer condition in patients (Wheeler, 2014). In another study conducted by Andersson et al explained that there is no difference between the age of patients with the incidence of pancreatic cancer (Andersson et al, 2016).

A study of 29,133 Finnish men with smoking habits revealed that diabetes mellitus and increased insulin concentration increased the risk of developing pancreatic ductus adenocarcinoma by 2-fold (Stolzenberg-Solomon et al, 2005). In other studies, a 2-fold increased risk for pancreatic malignancies in diabetic patients has even been reported from two meta-analyses, first conducted in 35 cohort studies (Ben et al, 2011), and the other in 3 large studies in which 2,192 patients with pancreatic cancer compared with 5,113 controls (Li et al, 2011). Diabetes is generally associated with a high body mass index (BMI), which has also been identified as an independent risk factor for pancreatic cancer. In a recent study, it has been calculated that patients with concurrent diabetes and chronic pancreatitis have an increased risk of developing pancreatic cancer, compared with subjects without this comorbidity (Liao, 2012).

This epidemiological finding supports the hypothesis that chronic exposure to hyperglycemia, higher insulin concentrations, and insulin resistance may be responsible for an increased risk of pancreatic cancer. The molecular mechanisms of diabetes-related proliferation and genic tumors have not been fully explained. Hyperglycemia can increase proliferation, local invasion and metastatic potential in pancreatic cancer. Hyperinsulinemia can stimulate the proliferation of pancreatic cancer cells expressing growth factor receptors such as insulin and G-protein receptors in excess (Stolzenberg-Solomon et al, 2005). Analysis of genomic association research data pathways in patients with pancreatic cancer showed a link between susceptibility to pancreatic cancer and some pancreatic development genes associated with type 2 diabetes (HNF1A and HNF1B) or involved in lipid metabolism and glucose metabolism (NR5A2) (Li et al, 2011).

The results of this study are not in line with general findings about DM as a risk factor for pancreatic cancer. The authors argue that the differences in these findings are due to several things, including the exclusion of other risk factors in the analysis. Another factor that can affect is the type of drug used in DM patients, metformin is thought to have a protective effect on the incidence of pancreatic cancer (Xin et al, 2018).

The limited number of samples and coverage of the sample covering only the North Sumatra region alone can also be a factor in the difference in results. During the work of this research, researchers have not found similar research in Indonesia. It is suggested to other centers to be able to conduct similar research, to further assess the relationship between DM and pancreas incidence in Indonesia.

CONCLUSION

In this study it can be concluded that there is a correlation between incidence of pancreatic cancer with DM ($p = 0,001$, $p < 0,05$; 95% CI = 0,07-0,5) and diabetes mellitus is protective factor for pancreatic cancer (OR = 0.196). Further studies are needed to further explore the role of other risk factors that may affect the incidence of pancreatic cancer and assess the association between DM incidence and pancreatic cancer.

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