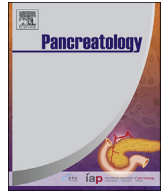




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Quality of life comparison between smokers and non-smokers with chronic pancreatitis

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ABSTRACT

Objectives: The aim of this study was to evaluate the impact of smoking on quality of life in patients with chronic pancreatitis.

Methods: This is a cross-sectional study of chronic pancreatitis patients followed at a single institution comparing smokers with non-smokers. The primary outcome was quality of life and secondary outcomes included demographics, drug and alcohol use, anxiety and depression, pain level, nutritional status, and metabolic factors.

Results: 48 smokers and 45 non-smokers participated in this study. Smokers had a worse overall quality of life and higher rates of opioid addiction and depression than non-smokers. Smokers also had less racial diversity, lower education levels, and higher amounts of narcotic use than non-smokers. Furthermore, smokers had a lower BMI and a higher proportional use of pancreatic enzyme replacement therapy. Smoking was found to be independently associated with worse quality of life on multi-variable regression.

Conclusions: The worse overall quality of life and higher rates of depression and anxiety create cause for concern in chronic pancreatitis patients who smoke. Smoking cessation should be an important target in chronic pancreatitis patients. Multicenter, multiethnic studies are needed to further elucidate this relationship.

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Introduction

Smoking continues to draw attention for its harmful role in chronic pancreatitis. Smoking is a clear risk factor for the progression of acute pancreatitis to chronic pancreatitis in a dose-dependent manner [1,2]. Furthermore, once chronic pancreatitis develops, smoking can increase the formation of complications such as pancreatic calcifications, exocrine insufficiency, and pseudocysts, indicating its propensity to accelerate disease progression [3–5].

Studies have demonstrated that a high proportion of patients

with chronic pancreatitis smoke, but little is known regarding the effects of smoking on quality of life in patients with chronic pancreatitis [6–8]. As there now exists a validated instrument specifically designed to evaluate the quality of life in this patient population, the primary aim of this study was to compare quality of life between smokers and never-smokers with chronic pancreatitis.

Materials and methods

This is a cross-sectional study within a prospectively collected cohort of patients, approved by our institutional review board. Recruiting was performed from patients with chronic pancreatitis who met the inclusion criteria outlined in Table 1. If patients agreed to participate, they were seen after their regularly scheduled follow-up visit at our chronic pancreatitis clinic. During that visit, an informed consent was signed, a series of questionnaires (detailed below) were given,

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Table 1
Inclusion - exclusion criteria.

Inclusion criteria	Exclusion criteria
Patient must have one of the following two features: (a) Presence of pancreatic calcification as demonstrated by CT scan or KUB imaging (b) Presence of five out of nine criteria of pancreatic injury by endoscopic ultrasound in conjunction with a positive secretin stimulation test to confirm pancreatic insufficiency.	Patient to be excluded from the study if they have one of the following features: (a) Age less than 18 years (b) Comorbidities including end-stage cancer (estimated survival < 6 months), HIV (T4 cell count < 50), end-stage congestive heart failure, end-stage chronic obstructive pulmonary disease, uncompensated cirrhosis, renal failure (on dialysis or with CrCl < 25), or pre-existing diabetes mellitus (c) Prisoners (d) Non-English speaking (e) Former smokers

CT: computed tomography; KUB: kidney, ureter, and bladder; CrCl: creatinine clearance.

and blood was drawn for laboratory studies (discussed below). All recruiting was done by two physicians (LB, WW) who primarily follow chronic pancreatitis patients at our tertiary academic medical center. Smokers were self-identified by patients who smoked 1 or more cigarettes a day. Only current smokers and those who never smoked were enrolled in this study, previous smokers were not included.

Demographics form

A demographics form which included standard variables such as age, gender, and race was completed by each patient. It also included socioeconomic variables such as education level, marital status, and employment status. Medication use was also documented, including the use and dosage of pain medications, antidepressants, diabetes medications, pancreatic enzyme supplementation, and nutritional supplements.

Questionnaires

A series of validated questionnaires were given to every patient and these included: 1) the PANcreatitis Quality Of Life Instrument (PANQOLI) [9], a questionnaire specifically designed to assess quality of life in chronic pancreatitis populations, 2) the Screener and Opioid Assessment for Patients with Pain-Revised (SOAPP-R) [10], which assesses the potential for opioid addiction, 3) the Drug Alcohol Screening Test (DAST) [11], which screens for drug abuse misuse, 4) the Michigan Alcohol Screening Test (MAST) [12] which detects alcoholism 5) the Brief Cope 24 which measures coping skills [13], 6) the Hospital Anxiety and Depression Scale (HADS) [14] which detects depression and anxiety, 7) the Malnutrition Universal Screening Test (MUST) [15] which evaluates for malnutrition, and 8) the Visual Analog Scale (VAS) which was used to determine the patient's level of pain.

Laboratory and endoscopy data

All patients had laboratory data collected to assess for nutritional and metabolic factors including Vitamin A, Vitamin D, Vitamin E, Vitamin K, prothrombin time, magnesium, calcium, albumin, prealbumin, and triglyceride levels (hypertriglyceridemia defined as a serum triglyceride level ≥ 200) [16]. Secretin stimulation testing was done as previously described and peak bicarbonate levels were measured for patients [17]. All patients received endoscopic ultrasound (EUS) for confirmation of chronic pancreatitis and disease severity was graded as previously described using number of EUS criteria (hyperechoic foci, hyperechoic strands, lobularity, hyperechoic duct, irregular duct, visible side branches, ductal dilation, calcification, and cysts) present [18,19].

Statistical analysis

Continuous values were reported as mean \pm SD. Statistical analysis was performed using Fisher's exact test for categorical variables and Student's t-test for continuous variables in comparing the two groups (STATA 14.2, StataCorp, College Station, Texas, USA). Multivariable linear regression analysis was performed to determine independent predictors of quality of life using PANQOLI scores as a marker for quality of life. Independent variables for this analysis included demographic and disease characteristics. A two-sided P value < 0.05 was considered to be significant. No corrections were made for multiple comparisons.

Results

Demographics and disease characteristics

A total of 95 patients with chronic pancreatitis were identified in this study, of which two (smokers) were excluded due to the presence of stage IV cancer, leaving 93 patients (48 smokers and 45 non-smokers). The mean age was 48.5 (± 10.5) years, 59 (63.4%) were female, and 78 (88.6%) were Caucasian. Smokers were significantly less heterogeneous in terms of race than non-smokers with non-smokers having more African-American and Hispanic patients ($p = 0.02$) (Table 2). They were less-educated than non-smokers ($p = 0.004$) and there was no significant difference in chronic pancreatitis etiology between the two groups. Overall, there was no significant difference in disease severity as measured by EUS findings between the two groups, but the smoking group had a higher proportion of patients with severe disease (25% vs. 6.7%, $p = 0.02$). The smoking group had on average a 25.5 pack-year history and currently smoked 0.7 packs (14 cigarettes)/day.

Quality of life

Smokers had a worse overall quality of life on the PANQOLI compared to non-smokers (50.3 ± 9.6 vs. 59.3 ± 16.2 , respectively, $p = 0.003$), a higher potential for opioid abuse in terms of the SOAPP-R ($p = 0.02$), and higher rates of depression and anxiety based on the HADS score ($p = 0.005$), but better coping skills on the Brief Cope 24 ($p = 0.009$) (Table 3). Multivariate analysis included demographic variables, smoking status, and chronic pancreatitis duration, severity and etiology. This regression revealed that quality of life based on the PANQOLI was only significantly associated with smoking with a parameter estimate or a coefficient of -8.6 , suggesting an inverse relationship of smoking with quality of life ($p = 0.008$) (Table 4).

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