Determination of patient quality of life following severe acute pancreatitis

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Background: Severe acute pancreatitis results in significant morbidity and mortality. Clinical experience suggests a significantly reduced quality of life for patients, but few studies exist to confirm this experience. We sought to objectively demonstrate patient quality of life after severe acute pancreatitis. **Methods:** Forty-two patients were assessed 24–36 months after an episode of severe acute pancreatitis. Patients completed the English Standard Short Form 36 survey (SF-36) and a questionnaire about pancreatic function to assess both their health-related quality of life and symptoms of pancreatic dysfunction. **Results:** Compared with the general Canadian population, survivors of severe acute pancreatitis had significantly reduced SF-36 scores. There is also a significant correlation between the Ranson score at presentation and the SF-36 Physical Composite Score at time of follow-up (rho = –0.47, p = 0.03). Seventy-six percent of patients had ongoing symptoms suggestive of pancreatic dysfunction. These included abdominal pain, diarrhea, unintentional weight loss, new onset of diabetes mellitus and the need for regular pancreatic enzyme supplementation. **Conclusions:** Survivors of severe acute pancreatitis had a reduced quality of life compared with healthy controls. Higher Ranson scores at presentation may predict which patients are more likely to have poorer outcomes in the first few years of their recovery.

Contexte : La pancréatite aiguë sévère cause des taux importants de morbidité et de mortalité. L'expérience clinique indique que la qualité de vie des patients diminue considérablement, mais peu d'études peuvent confirmer cette expérience. Nous avons cherché à démontrer objectivement la qualité de vie des patients après une pancréatite aiguë sévère. **Méthodes :** On a évalué 42 patients de 24 à 36 mois après une crise de pancréatite aiguë sévère. Les patients ont rempli le questionnaire 36 abrégé standard en anglais (SF-36) et un questionnaire au sujet de la fonction pancréatique pour qu'on évalue leur qualité de vie reliée à la santé et les symptômes de dysfonction pancréatique. **Résultats :** Les résultats du questionnaire SF-36 chez les survivants d'une pancréatite aiguë sévère étaient significativement moins élevés que ceux de la population canadienne en général. Il y a aussi un lien significatif entre le score Ranson au moment de la présentation et le résultat composite physique SF-36 au moment du suivi (rho = –0,47, p = 0,03). Soixante-seize pour cent des patients présentaient des symptômes continus indiquant une dysfonction pancréatique. Ces symptômes comprenaient la douleur abdominale, la diarrhée, la perte de poids involontaire, un diabète d'apparition récente et le besoin de suppléments périodiques d'enzyme pancréatique. **Conclusions :** La qualité de vie des survivants d'une pancréatite aiguë sévère était inférieure à celle des témoins en bonne santé. Les scores Ranson plus élevés au moment de la présentation peuvent permettre de prévoir chez quels patients les résultats sont les plus susceptibles d'être plus mauvais au cours des premières années du rétablissement.

Acute pancreatitis is a common disease with an annual incidence ranging from 5 to 80 per 100 000 population.[1–4] In most cases, the course of the disease is benign. Unfortunately, up to 20% of patients with pancreatitis develop severe disease with a mortality rate of up to 40%.[1,4–6] These patients are at high risk of multisystem organ failure, systemic inflammatory response syndrome and sepsis. Those who survive

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a severe bout of acute pancreatitis are also at risk of developing complications such as pancreatic pseudocysts, fistulae and abscess, as well as endocrine and exocrine dysfunction and pain.[4,7]

Few studies have investigated the development of chronic pancreatitis or quality of life after severe pancreatitis. Those that have, found no significant difference between the quality of life of survivors of the disease compared with population norms.[7–10] These findings do not correlate with our experience in managing patients with severe acute pancreatitis. Frequently, patients will develop significant complications related to their disease and complain of increased pain and decreased physical well-being compared with the general population. We hypothesized that, following an episode of severe acute pancreatitis, patients would have a reduction in overall quality of life particularly in the areas of pain and physical well-being. We also predicted that increasing severity of pancreatitis at presentation would correlate with poorer long-term quality of life.

Methods

From July 15, 1999, to Dec. 15, 2001, patients with pancreatitis of all causes were identified and screened for eligibility as part of a nutritional support trial comparing enteral with parenteral nutrition in severe pancreatitis.[11,12] This study was conducted at 3 teaching hospitals associated with the University of Alberta that serve a population in excess of 1 million. Eligible patients were required to have severe acute pancreatitis with a Ranson score of 3 or greater[13] and an inability to tolerate the oral administration of fluids 96 hours after admission. Patients were excluded if they were less than 18 years of age or unable to accept enteral nutrition via an endoscopically placed nasojejunal feeding catheter or other nutritional support. Approval for this study was obtained from the Health Research Ethics Board of the University of Alberta, Edmonton.

A total of 728 patients with acute pancreatitis were identified, of whom 184 had acute pancreatitis with a Ranson score of 3 or greater. Of these patients, 142 were excluded because they tolerated oral intake (n = 120), died during screening (n = 6), experienced an intestinal perforation during endoscopic retrograde cholangiopancreatography (n = 5) or met other exclusion criteria (n = 11). Therefore, 42 patients with severe acute pancreatitis were eligible for enrolment in the nutritional support trial. These 42 individuals formed a convenience sample of patients with severe acute pancreatitis who were followed and whose quality of life and symptoms of chronic pancreatitis were assessed.

The medical records of all 42 patients were reviewed for demographic and current contact information. Important clinical information such as repeat admissions or death was also gleaned from the medical records. Specific information about the cause of death was gathered directly from provincial death certificates. Patients were initially approached by telephone to re-establish contact, to provide feedback about the nutritional support trial, and to explain the nature of and reasons for the current study. Two questionnaires were then distributed to patients by 2 methods. Patients had the option of returning to the research office where they were interviewed and the surveys completed, or the questionnaires were sent by express mail for completion, with telephone support as necessary.

The English Standard Short Form 36 (SF-36) is a widely used general quality-of-life questionnaire that has been validated in a variety of medical settings and has been used by others studying pancreatitis. The SF-36 examines 8 areas consisting of social and physical function, physical and emotional well-being, bodily pain, vitality, mental health and overall general health perception.[14] Canadian normative data of age-matched controls were used for comparison.[15]

Patients then completed a questionnaire examining current pancreatic function. In particular, data were collected regarding symptoms of abdominal pain using a visual analogue pain score, readmissions to hospital for pancreatitis, surgical interventions, bowel habit, unintentional weight loss, use of enzyme supplementation and the development of diabetes mellitus.

Data were collected prospectively. Continuous variables were summarized using means and standard deviations. Spearman's rho was used as a measure of correlation. Student t tests were used to compare group scores with published normal scores.

Results

Forty-two patients were eligible for this study. At the time of follow-up, 8 patients were deceased, 8 patients were lost to follow-up and 1 patient was unable to complete the surveys secondary to Alzheimer's dementia. The remaining 25 patients were able to give informed consent and completed both surveys 24–36 months after their acute episode of pancreatitis. Patient demographics for those who responded to the surveys and those who did not or could not are listed in Table 1.

There were 8 deaths within our study population. Three deaths occurred during the nutritional support trial; the causes of death were sepsis or multiorgan system failure secondary to acute pancreatitis. Five patients died during the follow-up period; the causes of death were coronary artery disease (n = 2), biliary tract cancer (n = 1), angiodysplasia of the colon (n = 1) and acute pancreatitis (n = 1). These 8 patients were older and had more severe disease than surviving respondents in this study, with an average age of 73.5 (range 62–96) years and an average Ranson score of 5.6 (range

3–8), but there was no statistically significant difference between patients who lived or died with respect to age, sex or Ranson score. Significant comorbidities existed in the subgroup who died, including known coronary artery disease in 6 patients, pre-existing renal failure in 2, hepatitis C in 1, previous cardiac transplant in 1 and pre-existing biliary cancer in 1.

When compared with age-matched Canadian controls, the survivors of severe acute pancreatitis had significantly reduced SF-36 scores in the domains of social and physical function, general health, and physical and emotional role. These scores also translate into a significantly lower Physical Composite Score (Fig. 1). Further analysis also showed a significant correlation between the Ranson score at presentation and the SF-36 Physical Composite Score at time of follow up (rho = –0.47, p = 0.03). There was no significant correlation between Ranson score and SF-36 Mental Composite Score.

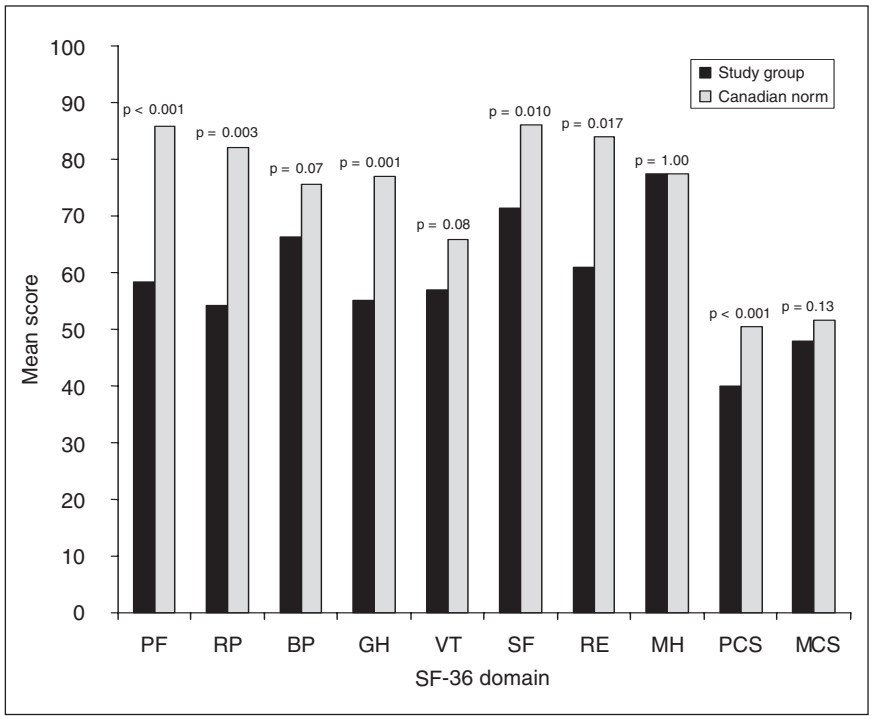

FIG. 1. A comparison of scores on the English Standard Short Form 36 (SF-36) health-related quality-of-life questionnaire for the study population and Canadian normative values. Domains: Physical Function (PF), Role Physical (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Role Emotional (RE), Mental Health (MH), Physical Composite Score (PCS), Mental Composite Score (MCS). $p < 0.05$ is considered a significant difference.

Table 1

Demographic and clinical characteristics of the study population (n = 42)

Characteristic	Patient group; no.*		
	Respondents (n = 25)	Surviving non-respondents (n = 9)	Deceased non-respondents (n = 8)
Mean age (and range), yr	58.8 (37–86)	58.6 (30–94)	73.5 (62–96)
Sex, no. (and %)			
Male	16 (64)	2 (22)	6 (75)
Female	9 (36)	7 (78)	2 (25)
Mean Ranson score (and range)	4.6 (3–8)	5.7 (3–9)	5.6 (3–8)
Origin of pancreatitis			
Gallstone	11	6†	2
Alcohol	4	1	2
Hypertriglyceridemia	2	—	—
ERCP-induced	—	1	2‡
Idiopathic	8	—	2
Operative management			
Laparoscopic cholecystectomy	6	4	2
Pancreatic débridement	1	1	
Cystgastrostomy	1		
Abdominal washout and abscess drainage	1	1	

ERCP = endoscopic retrograde cholangiopancreatography.
*Unless otherwise indicated.
†1 patient with concurrent pancreatic cancer.
‡1 patient with concurrent biliary tract cancer.

All 25 participants who completed the SF-36 also completed the pancreatic function questionnaire. Whereas 24% had no attributable symptoms, 76% of patients had ongoing symptoms since their bout of severe acute pancreatitis, suggesting ongoing pancreatic dysfunction. These symptoms included abdominal pain with a visual analogue score of 4 or greater, frequent diarrhea and unintentional weight loss. Eight (32%) patients developed newly diagnosed diabetes mellitus since their pancreatitis, and 5 (20%) patients required regular pancreatic enzyme supplementation. Twenty-eight percent of respondents had a single ongoing complaint, 12% had 2 ongoing symptoms, and 36% of respondents had 3 or more ongoing symptoms (Table 2).

Discussion

The past several decades have seen dramatic improvements in the management and survival of patients with severe acute pancreatitis. However, data are lacking regarding the long-term follow-up of patients who have experienced an episode of severe acute pancreatitis in terms of quality of life and the risk of development of chronic pancreatitis.

In this study, we demonstrated a statistically significant reduction in the domains of physical and social functioning, physical and emotional role, and general health of patients who had experienced an episode of severe acute pancreatitis when compared with healthy Canadians. In addition, the Physical Composite Score was also significantly reduced in these patients compared with healthy Canadians. Although Broome and colleagues,[8] and subsequently Soran and colleagues,[7] found no statistical difference in quality of life after severe acute pancreatitis, their results show a definite trend toward a reduced quality of life across these same domains. Halonen and colleagues[10] also found a statistically significant reduction in the SF-36 general health domain among their patient population, but they concluded that this difference was not clinically significant.

A fourth study, performed by Bosscha and colleagues,[9] found no difference in quality of life among survivors of necrotizing pancreatitis, but 2 major criticisms may be made of this study. First, rather than using

Table 2

Patients' symptoms related to pancreatic function at follow-up

Patient	Abdominal pain*	Diarrhea	Weight loss†	New DM	Required enzyme suppl.‡	Total symptoms	Origin of pancreatitis
1						0	Alcohol
2	X	X	X			3	Alcohol
3	X			D		2	Alcohol
4	X	X		D, I, O		3	Alcohol
5						0	Gallstone
6						0	Gallstone
7						0	Gallstone
8						0	Gallstone
9		X				1	Gallstone
10		X				1	Gallstone
11					X	1	Gallstone
12		X				1	Gallstone
13	X					1	Gallstone
14			X			1	Gallstone
15	X	X	X		X	4	Gallstone
16	X	X		D, O		3	Hypertriglyceridemia
17	X		X	D, O		3	Hypertriglyceridemia
18						0	Idiopathic
19		X	X	I		3	Idiopathic
20	X		X	D, I	X	4	Idiopathic
21	X		X			2	Idiopathic
22	X	X	X		X	4	Idiopathic
23				I	X	2	Idiopathic
24		X				1	Idiopathic
25	X	X		I		3	Idiopathic
Total	11	11	8	8	5		

D = diet controlled; DM = diabetes mellitus; I = insulin controlled; O = oral hypoglycemic controlled; suppl. = supplementation.
*With visual analogue score > 3.
†Unintentional weight loss.
‡Regular enzyme supplementation required.

the SF-36 quality-of-life measure, they chose Karnofsky and Rankin scores and the Sickness Impact Profile as measures. This makes comparisons between this and other studies more difficult. More important, Bosscha and colleagues claim that survivors of severe acute pancreatitis "regain a good quality of life." However, among the 28 patients with necrotizing pancreatitis in their study, only 12 were available for quality-of-life analysis, the others having died of their disease or other causes. With such a small number of patients and less than 50% of their patient population surviving to follow-up, generalizations regarding patient quality of life cannot be made.

There are several differences between our study and earlier studies, which may explain our significant findings. First, we achieved a concentrated patient follow-up period of 24–36 months creating a focused "snapshot" of patient quality of life at this point in time. This compares favourably with the studies carried out by Soran and colleagues (17–69 mo),[7] Broome and coworkers (51 mo)[8] and by Halonen and colleagues (19–127 mo).[10] Second, our study population encompasses only severe cases of pancreatitis. In contrast, the range of Acute Physiology and Chronic Health Evaluation (APACHE) scores in the study by Soran and colleagues included those as low as 5, suggesting the inclusion of patients with milder disease. Therefore, the severity of disease at presentation within our study population may also explain some of our findings. Our population is also older (mean 58.8 yr) than in the studies by Soran and colleagues (52.5 yr),[7] Broome and coworkers (51 yr)[8] and Halonen and colleagues (44 yr),[10] and advanced age alone may have an effect on baseline patient quality of life by way of compounding comorbidities.

Admittedly, it is possible that with time, patients' own perception of their quality of life improves as they learn to adapt to their symptoms,[16] and this "response-shift bias"[17] may partly explain the better quality-of-life scores observed in the studies discussed here.[7,8,10] Thus, at least during the first few years after their disease, patients have a diminished quality of life, particularly across the physical domain. Measuring quality of life over a longer follow-up period may better delineate this difference.

In our study, most patients experienced at least 1 symptom of pancreatic dysfunction, and over 40% of patients had evidence of pancreatic endocrine and exocrine dysfunction after acute pancreatitis. Previous studies have found symptoms of chronic abdominal pain in up to 93% of patients with chronic pancreatitis[2,4,10,18,19] and steatorrhea (a marker of exocrine dysfunction) in up to 30%.[4] Within the group of patients with pancreatitis associated with gallstones, patients' complaints of diarrhea may relate to symptoms following their cholecystectomy and not their pancreatitis. New-onset diabetes mellitus has been reported in 20%–30%[4] of patients with chronic pancreatitis and 54% of patients who have survived severe acute pancreatitis.[20] Our results complement the findings of these previous studies.

About 25 years ago, Ranson and Pasternack published a scoring system to predict patient morbidity and mortality from acute pancreatitis.[21] It has since been shown to correlate well with length of hospital stay and to be as good a prognostic model as the APACHE II and III scoring systems.[5] It seems logical then that the Ranson score should correlate with long-term patient quality of life, with increased severity of disease predicting a poorer outcome. Our study demonstrates such a correlation. That the Ranson score can identify at-risk patients at the time of their presentation may allow us to ultimately improve quality-of-life outcomes for these individuals by implementing timely and appropriate rehabilitative strategies. This should be confirmed by a larger, prospective analysis.

Patients who survive severe acute pancreatitis have a reduced quality of life compared with healthy controls, during the 2–3 years following their recovery. This is particularly true across the physical domain. With the passage of time, patient quality of life may return to a normal level, but this needs to be explored further within a focused follow-up period. The Ranson score at presentation may predict which patients are likely to have a reduced quality of life. Over 40% of patients have ongoing, symptomatic complaints after severe acute pancreatitis including abdominal pain, as well as endocrine and exocrine dysfunction. Survivors of severe acute pancreatitis have a difficult period of recovery to endure and this period of time has a demonstrated, deleterious effect on their quality of life. Knowing this, we must intervene early during a patient's recovery in an effort to ultimately shorten this period and speed patients' return to normal living.

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