

# Pain Intensity and Perceived Social Support among Patients with Pancreatic Tumors

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## Abstract

**Purpose:** Patients with pancreatic malignancy suffer from intractable and persistent pain that can only be effectively treated by the use of opioids. Such pain significantly impacts quality of life and becomes the stigma of the disease and dying. The aim of the study was to evaluate the psychosocial correlates of pain among the pancreatic cancer patients, with a special emphasis on social support.

**Methods:** One hundred and thirty one patients (52 women and 79 men) diagnosed with pancreatic cancer participated in the study. Visual Analog Scale (VAS) was used to assess current pain intensity. Social support was assessed by the subscale "Family and social living" of FACT-G and the Visual Representation Scale PRISM.

**Results:** There was a strong correlation between pain intensity and the social support measured by subscale of FACT-G in the opioid-using group (measured by VAS  $r=0.47$ ,  $p<0.05$ ) and measured with the PRISM ( $r=0.81$ ,  $p<0.05$ ). In the opioid-naïve group, there was no relationship between pain and perceived social support level. In women, pain strongly correlated with social support: VAS/FACT correlation was  $r=-0.64$ , VAS/PRISM  $r=-0.62$  (both  $p<0.05$ ).

**Conclusions:** In patients suffering from pancreatic cancer that use opioids, higher level of pain is connected with higher perceived positive impact of illness on social relations and with higher level of perceived social support. In contrary, in female patients, lower social support is associated with higher level of pain. Social support is an important contributor to pain perception in patients receiving opioids and in female patients.

## Introduction

Pancreatic cancer is the 4<sup>th</sup> most frequent cancerous cause of death in the US and the 6<sup>th</sup> in Europe. Every year about 2,00,000 patients die worldwide due to it, while 2,00,000 new cases are diagnosed. Just at the moment of diagnosis as much as 75% cases are inoperable, while next 15% are diagnosed inoperable during laparotomy. Moreover, out of those remaining 10%, half would develop local or distant recurrence. Generally, 5 year survival will be achieved by 5% and 1 year survival by 25% [1,2]. The fact that over 80% of pancreatic tumors cannot be removed surgically and these patients with unresectable cancer are embraced by the symptomatic treatment only places the issue of symptom control in the middle of attention [1]. Results of many studies present that this group of patients often suffer from intractable, persistent and incapacitating pain [2]. Pain was shown to be strongly associated with poorer quality of life, impaired functional activity and greater depression [3].

According to the World Health Organization guidelines for pain treatment, the 3-step analgesic ladder, the last step of the analgesic ladder consists of "strong" pure agonist opioids. The use of invasive surgical techniques, such as nerve blocks or splanchnicectomy is considered only if the pharmacological, noninvasive techniques fail and patients still suffers from pain. This order is being questioned, because of the results of clinical studies supporting the thesis that using multiple strategies is better way to control pain and improve quality of life [4]. In light of our previous research, Neurolytic Coeliac Plexus Block (NCPB) and Thoracoscopic Splanchnicectomy (TS) are effective methods in patients with chronic pain. Applying both invasive pain treatment has been proved to allow decrease of medication dose needed for pain relief [5,6].

The relations between pain and psychosocial factors were presented in many studies within the biopsychosocial model of medical

science. Age, gender, emotional state, cognitions such as expectations and perceptions of control are identified to be key factors in pain perception and thereby are strictly connected with treatment outcomes [7,8]. Social support is considered significantly linked to the quality of life and health status. Various studies have also resulted in similar findings that socially isolated people appear to be less healthy, more prone to development of illness [9] and tend to report higher level of pain [10]. In studies presenting relationships between social support and recovery after surgical treatment, it has been indicated that lower pain and better treatment outcome are observed in patients reporting higher social support level [10,11].

Nevertheless, the effect of social support may also result in reverse effect. Social support can be perceived as being highly rewarding and thus leads to aggravation of symptoms [9,11]. This phenomenon has been documented in many groups of patients: lower back pain, chronic pancreatitis and post-cholecystectomy pain syndrome [5,10,12].

On the basis of all considerations outlined above, the aim of the study was to discover the psychosocial conditions of pain level among the pancreatic cancer patients.

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## Materials and Methods

### Participants

131 patients diagnosed with pancreatic cancer, waiting for the surgical treatment in the treated consecutively in Department of General, Endocrine and Transplant Surgery, Medical University of Gdansk, Poland from January 2008 till March 2010 participated in the study. Mean age of the group was  $59.21 \pm 8.65$  years, there were 52 women and 79 men in the group. Patients were enrolled in the study on the basis of positive pathology report or presence of metastases. All the procedures followed were in accordance with the ethical standards of the Bioethical Committee of Medical University of Gdansk.

### Measures

Pain intensity was measured using Visual Analogue Scale (VAS) as an average level from last three days. It is a simple and frequently used method for the assessment of variations in intensity of pain in different groups of patients including pancreatic pain ones [6,13,14]. The measurement was a single, resting evaluation of a level of pain at the particular moment. The variable has been checked for normality with Kolmogorov-Smirnov test and normality of distribution was confirmed.

Social support was assessed by two different measures: 1. FACT-G subscale "Family/social well-being" and 2. Pictorial Representation of Illness-Self Measure (PRISM). First, a well-validated, also in Poland [15], and widely used subscale of FACT-G was used. The Functional Assessment of Cancer Therapy (FACT) is measuring health-related quality of life. It consists of questionnaires that assess multidimensional health status in people with various types and locations of cancer. It includes four primary subscales: Physical Well-Being, Social/Family Well-Being, Emotional Well-Being and Functional Well-Being. Each item of every subscale is assessed with a 5-point Likert-type scale [16]. The scale presents high reliability and consistency with Cronbach alpha reaching 0.92 and for the each scale 0.89 (Physical Well-Being), 0.75 (Social Well-Being), 0.82 (Emotional Well-Being), 0.85 (Functional Well-Being) [16].

Second, PRISM tool was used. It is a self reporting visual representation test to assess the subjective position of one's illness and social support in relation to the self. PRISM was used by Klis et al. [17] to assess perceived burden of illness in diabetes patients, while Kassardjian et al. [18] used it to assess suffering in chronic pain patients. PRISM consists of a rectangular piece of paper, with a yellow disk in the middle. Paper represents patient life at the moment and yellow disk represented the patient. The patients had to choose out of three differently sized red disks representing their medical problems. After choosing one of the disks, patients had to place it on the paper, in such a way that it represented their view on the medical problem at the current moment [19]. Additionally, disk in different colours can be used to represent other important aspects of the patient's life like family, work, hobbies and friends [20]. In our study PRISM also contained a blue disk representing social support. The main measures of PRISM are: a distance between the self and medical problem and social support disks and size of medical problems and social support. PRISM is a reliable method of assessing the perceived burden of suffering due to illness. Reliability of PRISM is good (test-retest reliability  $r=0.95$ ,  $p<0.001$  and interrater reliability  $r=0.79$ ,  $p<0.001$ ) [19,20].

The statistic analysis was performed using STATISTICA 7.0 PL software licensed to Medical University of Gdansk, Poland. It included

normality Kolmogorov-Smirnov test, t-Student tests and r Pearson correlations. In every case  $p<0.05$  was considered significant.

### Results

Pain intensity data were obtained from 130 patients. There were 88 patients (67.7%) that suffered pain and 42 that did not suffer from any pain. The overall average pain level measured by the VAS was  $35.7\% \pm 29.1\%$ , while in the suffering group was  $53.75\% \pm 18.36\%$ . The average social support measured by the FACT scale was  $69.24\% \pm 15.2\%$  and by the PRISM scale  $67.42 \text{ mm} \pm 23.26 \text{ mm}$  which is 58.2% of the maximum score interpreted as the highest possible support. The medication used was recorded in 97% of the patients (129 out of 131). There were 33 patients treated chronically with opioids and 96 opioid-naive ones. Mean duration of illness in opioid group was  $7.81 \pm 2.45$  months, while in opioid-naive  $6.22 \pm 1.58$  ( $p<0.05$  in t-Student test). Mean duration of pain was  $7.3 \pm 1.22$  months in opioid group and  $3.66 \pm 1.16$  in opioid-naive group ( $p<0.05$ ).

In overall evaluation, intensity of pain measured by VAS with social support subscale of FACT was weak ( $r=-0.18$ ) and did not reach statistical significance (Table 1).

In the opioid-using group, there was a strong correlation between pain intensity and social support measured with the PRISM scale ( $r=0.81$ ;  $p<0.05$ ) and FACT ( $r=0.47$ ;  $p<0.05$ ). More intensive pain was associated with higher level of perceived social support in the group using opioids. Interestingly, among patients not using opioids the relationship between pain and perceived social support level was not observed (Table 1).

Among women there was a strong correlation between the results of VAS-Pain scale and perceived social support of FACT scale ( $r=-0.64$ ;  $p<0.05$ ) and PRISM ( $r=-0.62$ ;  $p<0.05$ ). These mean that among women lower perceived social support was connected with higher level of pain. There was also a significant negative correlation between age and social support measured by FACT ( $r=-0.55$ ,  $p<0.05$ ), that indicate that older women received less social support. Those relationships were not confirmed among men (Table 2).

Considering external reliability of the tools, the correlation between FACT social support subscale and PRISM social support evaluation was statistically significant but low with  $r=-0.24$ ,  $p<0.05$ .

### Discussion

The results of the present study indicate that there is a strong and significant relationship between pain intensity and perceived social support level in pancreatic pain patients using opioids and in female patients with pancreatic pain. Those interactions are not observed in male patients and in those who are opioid-naive.

In the context of somatic disease social support shows potential to reinforce the symptoms, i.e. pain. Social exclusion might lead to

		Perceived social support (PRISM Scale)	Perceived social support (FACT Scale)
Pain intensity (VAS Scale)	Overall	-0.02	-0.18
	Opioid-treated	0.81*	0.47*
	Opioid-naive	0.14	-0.24

\* $p<0.05$

**Table 1:** Relationship between pain intensity and perceived social support among patients using opioids and in an opioid-naive group represented by r-Pearson correlation coefficients.

		Perceived social support (PRISM Scale)	Perceived social support (FACT Scale)
Pain intensity (VAS Scale)	Overall	-0.02	-0.18
	Women	-0.62*	-0.64*
	Men	-0.05	0.07

\*p<0.05

**Table 2:** Relationship between pain intensity and perceived social support among women and men represented by r-Pearson correlation coefficients.

a reduction in pain. It has been presented that patients exhibited a decrease in sensitivity to pain after being socially rejected [21-23]. In this way, pain behaviors might be strongly influenced by the patients environment, i.e. spousal or family attention to pain behavior may serve as an operant that can reinforce and therefore lead to increase in pain behavior. Relationships between pain and social support can also be conceptualized in terms of secondary gain, defined in psychodynamic paradigm as preconscious holding on to an unconsciously arisen illness which holding on is being reinforced with internal and external advantages [23-25]. Secondary gains are even described by some authors in terms of resistance to health [26]. In that context, they should be carefully evaluated in every study concerning chronic pain syndromes.

The complex phenomenon observed in this study can also be caused by some additional facts. The diversity of social support level in this group was very low, as all patients assessed received high social support. High level of perceived social support can be connected with the social perception of pancreatic cancer which is commonly seen as one of the most deadly and painful forms of cancer [2]. Among patients using opioids the higher pain level is connected with higher perceived positive impact of illness on social relations and with higher level of perceived social support. This can indicate that in this group of patients the operant model of pain behaviours appeals. There are many experimental studies supporting the point of view that the operant model of chronic pain leads to higher pain reports by proving that verbal reinforcement of those reports [8]. Family responses to patients' pain are seen as one of the most important exacerbating, alleviating and maintaining behaviours that should be carefully examined during the interview with patients suffering from chronic pain [8]. The question is why relationship between higher pain level and higher social support occurs only in the opioids taking group. One possible answer is that operant model of pain behaviors is connected with the chronic pain and the opioid-treated group had longer pain ailments duration. The other possible explanation is that opioid treatment itself can have adverse effect on social interactions [27-29]. Study of Stefaniak et al. [29] presents that chronic opioids use has an adverse effect on invasive pain treatment results in the chronic pancreatic pain patients. The factor responsible for unfavourable result of pain treatment among opioids using patients can be their decreased ability to take advantage of social support which is known to have significant influence on pain reduction. This result support thesis raised by other authors that introducing invasive techniques of pain control earlier, not when all other means including opioids treatment fail (which is in agreement with WHO guidelines), leads to better results [4,12].

Another interesting relationship between pain level and perceived social support identified in this study was observation that among women the lower perceived social support, the higher level of pain was reported. This is in accordance with reports claiming that nature of interpersonal transactions has greater influence on pain reaction in women than in men [23]. There are many studies supporting thesis that lower social support is connected with higher pain ailments [21,22].

Brown et al. [22] have shown that participants of study in support conditions reported less pain than those in the alone condition. Study of Kulik and Mahler [21] presents that married patients who received higher hospital support took less pain medication and recovered more quickly than their low-support counterparts. Another study of social support has shown that support influenced pain indirectly, by encouraging the use of specific coping strategies. These findings highlight the importance of others in promoting adaptive coping strategies [30]. Moreover, some research has shown that for female patients, the search for social support is more frequent pain coping strategy than for male patients, which may mean that the lack of such support is a more difficult situation for women [31]. Low perceived social support was identified as one of the factors responsible for remaining pain symptoms after cholecystectomy among women [27]. The nature of presented research does not allow drawing conclusions about causality, but it can be understood that distress by the insufficient level of social support leads to increased pain ailments [4]. On the other hand, increased report of pain ailments can be treated as the way to gain lacking social support, which is close to the concept of secondary gain [24,25]. Results of many empirical studies support the thesis that concept of secondary gain has the potential to shape illness behaviors [24-26]. The practical implications that can be derived from this study emphasize the meaning of social support for modifying pain ailments. This can also lead to show possible ways of psychosocial intervention referring not only to the patients themselves but also to their families. The aim of the intervention should be improving a way of giving support that helps to reinforce favourable activities instead of destructive pain behaviors. There is growing evidence that such operant programmes can lead to decrease of pain ailments [32,33].

Considering the choice of psychometric tools, the authors decided to use FACT-G because of its simplicity for the patients and previous experience. FACT's psychometric parameters enable reliable measurement and conclusions [15,16]. It has been used in more than 300 clinical trials as reported by PubMed. Pain evaluation has been performed on the basis of VAS with static, actual level of pain measurement. We decided to choose this form of measurement based on recent information of limited usefulness of retrospective pain evaluation (as utilized in Brief Pain Inventory) [34]. It is considered that reminiscence about the lowest or the highest pain in the past, even in last 24 hours is significantly biased by the current level of pain. It is also very difficult for the patient to assess average level of pain in previous 24 hours (or any other period of time). In that context, it is suggested to base on at least one, preferably two-three measurement of current pain intensity. On the other hand, pain registries, recording pain level on daily basis, several times a day, has been found to be unreliable and interfering with daily activities of the patient [34]. Therefore, we decided to base on a single measurement, undisturbed by memories or rumination.

In conclusion, it should be stated that social support seems to be an important contributor to pain perception in chronic pancreatic pain patients, especially in the group receiving opioids and in female patients. Those two groups may be further target of psychosocial interventions aimed to improve their well-being and diminish the intensity of suffering and experience of pain.

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