



Clinical pain research

Suicide attempts in chronic pain patients. A register-based study

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HIGHLIGHTS

- In a register study involving 1871 chronic pain patients in all 6% had attempted suicide.
- Chronic pain patients have a 3.76 increased risk for suicide attempts.
- Screening for risk factors is important in chronic pain patients.
- Risk factors are psychiatric, social, abuse problems, “intractable” pain.

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ABSTRACT

Background: There are several studies about the relationship between depression and chronic non-malignant pain. These studies have shown that up to 50% of chronic pain patients are suffering from depression.

It is, therefore, reasonable to expect that pain patients would also have an increased risk of suicidal behaviour. This problem is not well studied.

Since 1990 the Centre for Suicide Research, Odense, Denmark has registered all suicide attempts in patients residing in the Region of Funen, Denmark.

The Pain Clinic, Odense University Hospital receives patients with chronic pain from the entire Region of Southern Denmark.

Purpose: The purpose of the study has been:

To investigate, whether patients treated in the Pain Clinic during the period from 1 January 2004 to 31 December 2009 had an increased risk of suicide attempts compared with the background population.

Materials and methods: The Register for Suicide Attempts (RSA) is a product of the WHO research programme WHO/EURO Multicentre Study on Para suicide. The RSA is a longitudinal person-based register. It contains information about people who have been in contact with the health care system in the County of Funen as a result of a suicide attempt.

The Pain Clinic, Odense University Hospital receives patients with non-malignant chronic pain from the Region of Southern Denmark with 1,194,659 inhabitants. Data about age, sex, and time of treatment for patients treated in the Pain Clinic during the period were registered. Time and method of the suicide attempts were registered in the RSA. By registry linkages between the patient registers it was possible to calculate any excess risk of suicide attempts in chronic pain patients in the study period.

We used a cohort design and calculated incidence rates (IR) and incidence rate ratios (IRRs) for suicide attempts, based on data from RSA. Poisson Regression analyses were used for calculation of IR and IRR for suicide attempts.

Results: In the study period from 1 January 2004 to 31 December 2009 1871 patients residing in the Region of Funen in Denmark were referred to The Pain Clinic.

In the patient group 258 suicide attempts in 110 persons were registered. In all 6% of the patient group had attempted suicide.

An increased risk of suicide attempts was found in the pain population as the incidence rate ratio (IRR) was 3.76 95% CI (3.22; 4.40). No statistical significant differences between men and women were found.

Conclusion: In a chronic non-malignant pain population, referred to a pain clinic, the risk of suicide attempts was increased.

Implications: It is important to be aware of risk factors for suicidal behaviour, i.e. pain history, depression, anxiety, abuse problems, and social problems when caring for patients with chronic pain. More knowledge and training of the staff caring for chronic pain patients are needed to decrease the risk of suicidal behaviour.

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1. Introduction

There are several studies about the connection between depression and chronic non-malignant pain. These studies have shown that up to 50% of chronic pain patients are suffering from depression [1].

It is, therefore, reasonable to expect that pain patients would also have an increased risk of suicidal behaviour. This problem is not well studied. Studies of suicidal ideation in chronic pain patients have found that between 5% and 30% of a pain population have suicidal thoughts [2].

1.1. Frequency of suicidal behaviour

A recent review article has shown that lifetime prevalence for suicide attempts for pain patients is doubled compared with the background population [2]. Lifetime prevalence of suicide attempts was between 5% and 14% and lifetime prevalence of suicidal ideation was 20%. The results in the review are based on very few and methodologically uncertain studies, especially the selection of the patients differed. Few larger studies exist, where the risk of suicidal behaviour in chronic pain patients has been assessed in larger populations. In a population survey from 1998, based on data from 5498 Hispanic citizens collected from 1982 to 1984, [3] a two to three fold increased risk of suicidal ideation and desire for death and suicide in people with chronic abdominal pain was found, compared with those without abdominal pain. Through logistic regression analysis and calculation of odds ratios the most predictive factor for suicidal ideation was found to be depression, followed by chronic abdominal pain.

Brennan-Braden and Sullivan [4] analysed data from the National Co-morbidity Survey Replication, an American survey comprising 5692 individuals from 18 years and older. The study was conducted from February 2001 to April 2003 and pain and suicidal conditions were self-reported. In addition, lifetime and past 12-month DSM-IV mental disorder and abuse conditions were analysed. Suicidal behaviour was assessed with questions about serious suicidal thoughts, suicidal plans, and suicide attempts. An unadjusted logistic analysis showed that the presence of a pain condition was associated with lifetime and 12-month suicidal ideation, plans, and suicide attempts. After controlling for demographic, medical, and psychological co-variables, pain condition remained significantly associated with lifetime suicidal thoughts and plans, OR was 1.4.

Another study [5] examined data from the Canadian Community Health Survey Cycle 1.2, a file by Statistics Canada from 2001 to 2002. A total of 36,984 people responded. The response rates were 77%. The participants were asked about the following conditions: migraine, lower back problems, arthritis, fibromyalgia, suicidal ideation, and suicide attempts. In addition, screening for mental disorders, using the World Health Organization International Diagnostic Interview, was performed. After adjusting for socio-demographic factors, Axis 1 mental disorders, and co-morbidity (3 or more mental disorders) the study showed that the presence of one or more pain conditions were associated with risk of both suicidal ideation and suicide attempts. Among respondents with one or more pain conditions and an Axis 1 psychiatric disorder they found association with suicidal thoughts and attempts. The OR changed from 1.46 for suicidal ideation to 1.94 for suicide attempts. After adjustment for other risk factors the study also showed that migraine had the highest correlation with suicidal behaviour. The adjusted OR was 1.35 for suicidal ideation and 2.05 for suicide attempts.

The population studies [3–6] found an association between suicidal ideation and suicide attempts in patients who reported chronic pain conditions in cross sectional studies. Still, we need

more research in the field in order to understand this possible association between chronic pain and risk of suicidal behaviour in well defined pain populations.

1.2. Methodological problems and recommendations

The above studies were cross sectional without possibility for assessment of a causal relationship. In all the studies information of suicide ideation and suicide attempts was based on self-report, and recall bias can be present. A recommended method of investigating whether a particular disorder is involved with an increased risk of suicidal behaviour is to examine the incidence rate in a well-defined patient population and compare it with the incidence rate in the background population [7,8]. Such studies require a well described patient population, a valid assessment of the suicide risk in the cohort (pain and non-pain population (the background population)) and a longitudinal data structure [9].

1.3. Purpose of the present study

We have a well-defined pain and background population with valid information about suicide attempts. It is therefore relevant to plan a study with the following purpose:

^ To investigate whether patients treated at the Pain Clinic, Odense University Hospital, Denmark, during the period 1 January 2004 to 31 December 2009 had an increased risk of suicide attempts compared with the background population.

2. Materials and methods

2.1. Patient material

The Register for Suicide Attempts (RSA) is a product of the WHO research programme WHO/EURO Multicentre Study on Para suicide and has longitudinal structure. It has 11 variables, contains information about people who have been in contact with the health care system in the former County of Funen as a result of a suicide attempt and has annually been updated in the period 1989–2009 [9]. The Pain Clinic, Odense University Hospital receives patients with non-malignant chronic pain from the Region of Southern Denmark with 1,194,659 inhabitants.

Referral criteria for the Pain Clinic were:

- The patient must be motivated for a multidisciplinary pain management and be prepared to spend the time needed for re-medication, consultations, and training. The treatment will typically extend over several months.
- The patient must be willing to make changes in pain medicine.
- In cases of alcohol abuse, the patient must be willing to stop the abuse.
- The Pain Clinic only receives patients who are medically elucidated.
- The patient must understand that all prescription of pain medicine, sleeping pills, and sedatives comes from the Pain Clinic, as long as the patient receives treatment here.
- The patient cannot be referred to multidisciplinary pain treatment if the patient is also referred to another pain management (Pain Clinic or pain units).

The Pain Clinic was established in 2004 and has received 400–500 patients annually, of which the majority was residing in the Region of Funen.

2.2. Study protocol ethical approval

The Danish data Protection Agency was informed and approved the study.

2.3. The statistical method

All patients registered in the Pain Clinic database in the study period were connected with data from the RSA. By use of Poisson regression analyses, incidence rates (IR) and incidence rate ratios (IRRs) for suicide attempts were calculated. IR was calculated from 1994 to the end of the study period 2009 and, therefore, individuals older than 15 years of age, were included in the cohort 10 years before the year of the first contact to the pain clinic. The rationale for this is, that the clinical experience has been, that pain patients can have had pain for up to 10 years before the first contact to the pain clinic, and therefore, every suicide attempts carried out in that period might be related to the pain condition. We used the procedure *proc genmod* with Poisson distribution from SAS 9.3 on Windows [10]. The procedure returns estimates for IR and IRR, confidence intervals and *p*-values.

3. Results

In the study period from 1 January 2004 to 31 December 2009, 1871 patients residing in the former County of Funen in Denmark were referred to The Pain Clinic. Among these patients 258 suicide attempts in 110 persons were registered in the period from 1994 to 2009. In all 6% of the patient group had attempted suicide.

The IR for the two groups was calculated as the number of suicide attempts divided by the sum of the risk time (sum of person-years). The IRR was calculated as the fraction between the incidence rate for the pain population and the background population.

Fig. 1 shows the IR and 95% confidence intervals (CI) for the pain population. Fig. 2 shows the IR and confidence intervals for men and women respectively. The IRR for gender was 0.912 ($p = 0.5725$, $CI = [0.66; 1.25]$) and therefore, there was no significant difference between the IR for men and women.

For the pain-population we estimated the IRR to 3.76 ($p < 0.0001$, $CI = [3.22; 4.40]$) compared with the non-pain population. Thus, the risk of suicide attempts among pain patients during the 10-year prior to attending the pain clinic and the study period, was almost 4 times higher than in the general population of the same geographic area in Denmark.

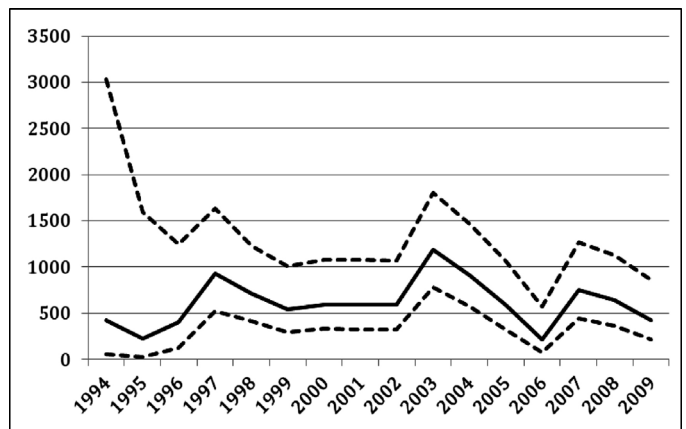


Fig. 1. Incidence rate per 100,000 patient-years and 95% CI for the pain population (Poisson regression estimates).

4. Discussion

4.1. Results in relation to previous studies

In the present study the pain population was a well defined chronic pain population referred to a pain clinic. Information about suicide attempt was based on information from a longitudinal person-based register, and 6% of the pain patients were registered. We found an almost fourfold higher risk in the pain population compared to the general population. The estimate is more valid, compared with other studies, as the study is based on longitudinal registers where registration is based on valid clinical diagnoses, with minimum risks for errors and recall-bias.

4.2. Risk factors for suicide attempts

Risk factors for suicidal behaviour in a chronic pain population have been elucidated in previous studies. In studies of suicidal ideation in chronic pain patients, it was found that between 5% and 66% of a pain population had suicidal ideation. Patients with suicidal ideation had longer duration of illness, greater pain intensity, central pain, and depression. Fishbain [12] pointed out a number of important general risk factors for suicidal behaviour: long duration of pain, higher pain intensity, financial compensation status, significant functional impairment secondary to pain and chronic abdominal pain. Tang and Crane [2] also found a number of general risk factors: family history of suicide, previous suicide attempts, to

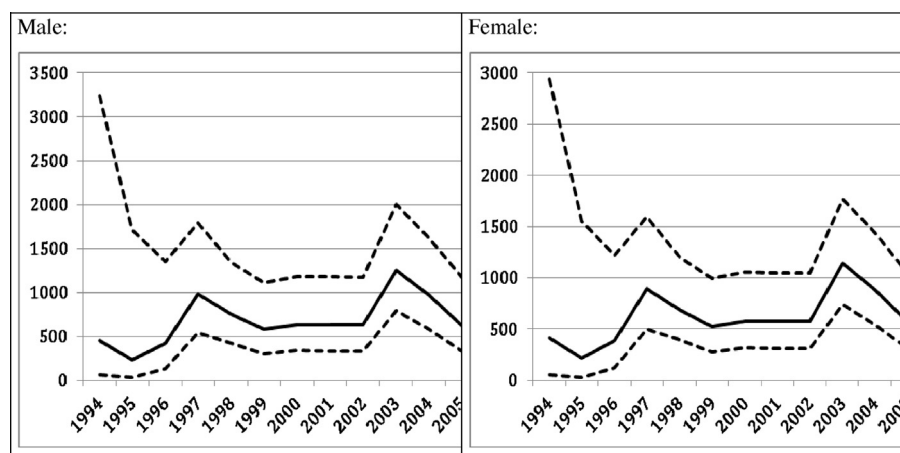


Fig. 2. Incidence rate per 100,000 patient-years and 95% CI for the pain population by gender (Poisson regression estimates).

be a women, major depression, migraines, and abdominal pain. In their study they found no correlation between intensity and duration of pain and risk of suicidal behaviour.

In an English study [11] of a 2-year period, pain was considered to be a contributory factor in the episode of deliberate self-harm in 75 (4%) of the total number of episodes of deliberate self-harm (1665). The study analysed a population of patients with concurrent medical problems admitted to a general hospital and data were based on a retrospective case note examination of all deliberate self-harm. The self-harm patients with medical problems and pain had higher suicide intent scores, but lower rates of previous psychiatric illness or alcohol or drug abuse than did the deliberate self-harm patients with medical problems but no pain. Although 60% had experienced pain for more than 6 months only, 8 (12%) were attending the local Pain Clinic at the time of the deliberate self-harm. The authors recommend a closer collaboration between general hospital services and local pain clinics in order to prevent deliberate self-harm in patients with painful disorders. Clinicians need to assess suicidal ideation and risk of self-harm when prescribing for this population. This recommendation is fully in accordance with the results of our study.

4.3. Limitations of the study

The limitations of this study are that it only includes suicide attempts that have resulted in a contact to the secondary health care system. Therefore our estimates must be minimum IR, as we are not including all suicide attempts done by the cohort. The study is a longitudinally study as we are following the cohort from 10 years before the first contact to the pain clinic to end of 2009. Individuals might move in and out of the region during that period and we do not have access to such data. Therefore our results might be slightly biased because individuals are not correctly censored in and out of the study. The two above situations are the same for both the pain and non-pain population and might therefore affect IRR in a complex way.

The difference in methodology can in part explain the difference in the results compared with previous studies. Our chronic pain population might be a more heavily burdened population, compared with other studies [3–5], as they were referred to a pain clinic. Some of the patients have had chronic pain for several years.

4.4. Conclusion

Chronic pain patients referred to a pain clinic had an almost four fold increased risk for suicide attempt compared to the background population.

4.5. Implications

It is important to be aware of risk factors for suicidal behaviour, i.e. pain history, depression, anxiety, abuse problems, and social problems when caring for patients with chronic pain. More knowledge about the risk and risk factors for suicidal behaviour, and training of the staff caring for chronic pain patients are needed to decrease the risk of suicidal behaviour in these individuals.

Conflict of interest

None declared.

References

- [1] Nicholas MK. Depression in people with pain: there is still work to do. Commentary on 'Understanding the link between depression and pain'. *Scand J Pain* 2011;2:45–6.
- [2] Tang Y, Crane C. Suicidality in chronic pain: a review of the prevalence, risk factors and psychological links. *Psychol Med* 2006;36:575–86.
- [3] Magni G, Rigatti-Luchini S, Fracca F, Merskey H. Suicidality in chronic abdominal pain: an analysis of the Hispanic Health and Nutrition Examination Survey (HHANES). *Pain* 1998;76:137–44.
- [4] Brennan Braden J, Sullivan MD. Suicidal thoughts and behaviour among adults with self-reported pain conditions in the national co morbidity survey replication. *J Pain* 2008;2:1106–15.
- [5] Ratcliffe G, Enns MW, Belik SL, Sareen J. Chronic pain conditions and suicidal ideation and suicide attempts: an epidemiological perspective. *Clin J Pain* 2008;24:204–10.
- [6] Fisher B, Haythornthwaite JA, Heinberg LJ, Clark M, Reed J. Suicidal intent in patients with chronic pain. *Pain* 2001;89:199–206.
- [7] Stenager EN, Stenager E. Physical illness and suicidal behaviour. In: Hawton K, van Heeringen K, editors. *International handbook of suicide and attempted suicide*. London: Wiley; 2000. p. 405–21.
- [8] Stenager EN, Stenager E. Physical illness and suicidal behaviour. In: Wassermann D, editor. *Suicidal behaviour in an international perspective*. Oxford: Oxford University Press; 2009. p. 293–305.
- [9] Christiansen E, Jensen BF. Register for suicide attempts. *Dan Med Bull* 2004;51:415–7.
- [10] <http://www.sas.com/technologies/analytics/statistics/stat/>
- [11] Theodoulou M, Harriss L, Hawton K, Bass C. Pain and deliberate self-harm: an important association. *J Psychosom Res* 2005;58:317–20.
- [12] Fishbain DA. The association of chronic pains and suicide. *Semin Clin Neuropsychiatry* 1999;4:221–7.