

Chronic pain syndromes and their relation to childhood abuse and stressful life events

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Abstract

Objective: Childhood abuse, stressful life events, and depression have been repeatedly reported to correlate with chronic pain, but little is known about the mutual relationships among these variables. **Methods:** Forty-three women with chronic pelvic pain (CPP), 40 female patients with chronic low-back pain (CLBP), and a female pain-free control group ($n=22$) were investigated by means of a semistructured interview assessing childhood sexual and physical abuse as well as stressful life events. Additionally, the Beck Depression Inventory (BDI) was used. For multivariate analyses, structured equation modeling was applied. **Results:** Childhood physical abuse, stressful life

events, and depression had a significant impact on the occurrence of chronic pain in general, whereas childhood sexual abuse was correlated with CPP only. Moreover, childhood sexual abuse was related to depression. Both childhood sexual and physical abuse showed a close relationship to an increased occurrence of stressful life events. **Conclusion:** There are complex mutual interactions among childhood abuse, stressful life events, depression, and the occurrence of chronic pain. Therefore, clinicians should take into consideration these psychosocial factors while treating chronic pain patients. © 2003 Elsevier Science Inc. All rights reserved.

Keywords: Chronic pelvic pain; Chronic low-back pain; Child abuse; Life events; Depression

Introduction

The onset and perpetuation of chronic pain syndromes represent a complex dynamic interaction of biological and psychosocial factors that have only been partly understood to date. The treatment of patients suffering from chronic pain syndromes poses a challenge to both patients and physicians. Numerous psychosomatic investigations have dealt with the etiology and dynamics of chronic pain syndromes. Engel [1] emphasized the impact of adverse childhood experiences in the development of chronic pain, and since then childhood sexual and physical abuse have been demonstrated repeatedly to increase the risk of the

occurrence of chronic pain syndromes. There are increased reports of sexual and physical childhood abuse in patients with abdominal pain [2,3], pelvic pain [4–8], fibromyalgia [9,10], musculoskeletal pain [11,12], and back pain [13,14]. The results of a recently published study by Raphael et al. [16], however, seem to call into question these formerly accepted views. Using a prospective cohort design, the authors investigated 676 cases with documented childhood abuse or neglect and 520 matched controls about 20 years after the victimization of the former group had been court substantiated. No significant relationship between documented abuse or neglect and pain symptoms in adulthood was found. Additionally, self-reports of childhood victimization were obtained from all participants of the study: 74% of those with documented victimization reported childhood victimization experiences themselves. However, 49% of the controls also reported victimization. A significant relationship

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between self-reports of childhood victimization and adult pain complaints was observed. The authors hypothesized that denial of childhood victimization could represent a “form of healthy coping,” whereas “victimization experiences that acquire a sustained attribution of ‘abuse’ in adulthood” might “lead to increased somatic complaints” (p. 291). Unfortunately, the group of “controls” with self-reported victimization was not excluded from the prospective analysis. Perhaps the lack of relationship between documented childhood abuse and adult pain symptoms can be attributed to this omission.

A number of studies have investigated the relation between stressful life events in adulthood and chronic pain syndromes. Leavitt et al. [21], Jensen [22], Smith et al. [23], and Atkinson et al. [24] did not find a significant correlation between these two variables, whereas Lampe et al. [15] and Craufurd et al. [19] found a significant relationship between stressful life events and chronic low-back pain (CLBP) of uncertain origin but not with CLBP with a well-defined organic cause. A similar result was reported by Creed et al. [18] in patients with functional abdominal pain. The authors found that, in particular, life events involving the break-up of close relationships preceded the development of functional abdominal pain. Thus, this issue remains unclear in the literature.

Furthermore, an increased incidence of depression has been observed frequently in victims of abuse [25,26] as well as in patients with chronic pain [27]. Walker et al. [25] investigated 100 gynecological patients and found a lifetime diagnosis of depression in 86% of women who experienced severe childhood sexual abuse compared to 36% in those who did not. McCauley et al. [26] assessed 1931 female patients at four community-based, primary care internal medicine practices and reported significantly higher depression scores (Symptom Checklist-22) in women who had been sexually abused in childhood compared to those who were not. From their review of 83 studies dealing with the relationship between depression and chronic pain, Fishbain et al. [27] concluded “that there is indeed a statistical relationship between the presence of chronic pain and depression and that depression is more common among chronic pain patients than healthy controls without pain” (p. 134).

Since a history of childhood abuse and depression and possibly also stressful life events are associated with adult chronic pain syndromes, the question arises to what extent these factors interact with each other. It could be hypothesized that childhood abuse leads to depression as well as to a higher incidence of and an increased vulnerability to stressful life events; all these factors might contribute to the occurrence of chronic pain. To test this hypothesis, this study investigates the history of childhood abuse as well as stressful life events and depression in women with chronic pelvic pain (CPP) and CLBP and a control group of pain-free female subjects.

Methods

Subjects

Forty female patients suffering from CLBP and 43 women with CPP were consecutively recruited at the outpatient units of the Department of Orthopedics and the Department of Gynecology of the University of Innsbruck, Austria. Inclusion criteria were: pain lasting longer than 6 months, age between 18 and 60 years, sufficient knowledge of the German language, and written informed consent. The control group consisted of 22 subjects without current pain and without chronic or recurrent pain in their history undergoing a routine check-up at their primary physician’s office. Classification of subjects with reference to their social classes was conducted according to Kleining and Moore [28].

Assessment methods

Data on childhood physical and sexual abuse and life events were collected by means of a semistructured interview performed by two psychodynamically trained female researchers. Verbatim protocols of the interviews were analyzed using a consensus rating of three psychiatrists who were blind to the patients’ diagnoses.

Physical abuse

Physical abuse included all physical violence against a child by a person in a position of authority. Severe physical abuse included repeated blows with the hand without visible injuries such as bruises and very severe physical abuse included all externally inflicted injuries resulting in tissue damage, as well as threats of severe violence with a possible fatal outcome for the child (e.g., threat with a knife). As sexual abuse is frequently associated with physical violence or threat of such violence, physical violence was rated as such only when it was not associated with sexual abuse.

Sexual abuse

Issues of affection and sexuality within the family were covered with 14 questions in accordance with Russell’s criteria [29] that ascertained in great detail possible sexual abuse. In cases where sexual abuse was reported to have occurred, patients were asked for details on duration, frequency, age at the time of abuse, threat of violence, age difference, and relationship to the perpetrator. Childhood sexual abuse was defined as abuse that occurred before the 15th birthday [4,25]. Sexual contact with peers was not defined as abuse if the contact was admitted to have been desired.

For assessment of severity of abuse, raters used Russell’s criteria [29]: (1) least severe sexual abuse, e.g., sexual touching of clothed breasts or genitals; (2) severe sexual abuse, e.g., genital fondling, simulated intercourse, or digital penetration; and (3) very severe sexual abuse, e.g., vaginal, oral, anal intercourse, cunnilingus, anilingus.

Table 1
Sociodemographic characteristics of sample

	CPP (<i>n</i> = 43)	CLBP (<i>n</i> = 40)	Controls (<i>n</i> = 22)
Age, years (mean/S.D.)	32.4/8.8	40.0/9.1**	29.3/8.1
Social status, <i>n</i> (%)			
Upper/upper middle class	1 (2.3)	2 (5.0)	0 (0.0)
Middle class	26 (60.5)	12 (30.0)**	15 (68.2)
Lower class	10 (23.2)	26 (65.0)**	7 (31.8)
Data missing	6 (14.0)	0 (0.0)	0 (0.0)
Duration of pain, years (mean/S.D.)	5.3/6.0	8.0/6.7	–
Last severe exacerbation of pain, years (mean/S.D.)	1.0/1.7	1.0/1.4	–

** *P* < .01.

Life events

The Inventory of Life Changing Events (ILE) was used to assess retrospectively stressful life events in the 2 years before the onset of pain (as proposed by the investigators). In cases where the beginning of the disease lay more than 2 years before the interview, the 2-year period preceding the last severe exacerbation of pain was investigated. According to information provided by the patients, this set date was on average 1 year before the interview (see Table 1). In order to guarantee comparability, life events in the control group were assessed for the time span of 1–3 years before the interview. The ILE is a semistructured interview developed by Siegrist and Dittmann [30] for the investigation of a German-speaking population. The instrument was chosen because it has been argued that the congruence of socio-cultural background of subjects and the instrument in investigating stressful life events is important [31]. The ILE is a 36-item interview-based inventory. The items deal with family, social and occupational environments, illness, death, rape, and injuries. At the end of the inventory, there are two open questions that ask subjects to remember if anything stressful had happened in their lives that was not covered by the other items. Furthermore, the interviewer asks the patients to describe the circumstances under which each mentioned event occurred.

To allow the most accurate dating of the occurrence of life events as well as the most recent exacerbation of pain, “anchor dates” were employed as proposed by Brown [32]. Patients were requested to recall if the event occurred before special days, such as his or her birthday, before Christmas or other holidays, etc. In case of doubt, patients were asked to use the calendar or to have a look at the medical report. Each event that had occurred within 2 years prior to the exacerbation of pain and had been considered unpleasant or stressful by the patient was taken into account.

In accordance with Siegrist and Dittmann [30], patients were asked to rate each mentioned event on a five-point rating scale as follows: degree of predictability of the event, possibility of controlling this life event, psychological vulnerability at the time of the occurrence of this event, relevance of the life event within the framework of subjective orientation, extent of alteration in daily routine, active coping

strategies, degree of social support, degree of coping effort, and the degree of continuing strain. According to the same authors [30], the subjective stress of an event increases with its unpredictability, uncontrollability, higher vulnerability of the subject at the time of an event, and with higher subjective relevance of the event. Furthermore, this strain dictates the extent to which an event results in the interruption of daily routine as well as the coping strategies the patient is able to use. Lack of social support, increased coping efforts as well as the continuing strain increase the amount of stress caused by a specific life event. This estimation allows the calculation of a quantitative score for each mentioned event ranging from 2 to 48 points. According to the authors, an event scoring higher than 28 points is considered highly stressful. Brown [32] has pointed out that the occurrence of only one highly stressful event represents a sufficient trigger for the development of illness, whereas repetitive events of this kind do not increase this risk. Finally, the ILE allows the calculation of the total stress for a person caused by life events by adding the scores for each mentioned event over the event dimensions (“sum score of distress by LE”). In order to prevent a bias by illness-related stressful life events we followed the suggestion of Brown and Harris [33] to exclude these life events from further analyses.

Depression

The Beck Depression Inventory (BDI) [34] was used to check for the influence of depression. Because symptoms of pain disorder can be confused with those of depression, a two-factor solution, differentiating between somatic symptoms of depression and cognitive–affective factors was computed [35].

Statistics

For group comparisons among the two patient groups and the control group, chi-square tests were employed in dichotomous and Kruskal–Wallis tests in ordinal variables.

In addition to the univariate analyses, a multivariate calculation, “structural equation modeling” (SEM), was employed to investigate the pattern of causal structure between predicting stressor variables (childhood abuse, stressful life events) and the occurrence of chronic pain as a dependent variable. Additionally, depression as an intervening variable was included in the analysis. “SEM is a statistical methodology that takes a confirmatory (i.e., hypothesis testing) approach to the analysis of a structural theory bearing on a given phenomenon. Typically, this theory represents ‘causal’ processes that generate observations on multiple variables. The term ‘structural equation modeling’ conveys two important aspects of the procedure: (a) that the causal processes under study are represented by a series of structural (i.e., regression) equations and (b) that these structural relations can be modeled pictorially to allow a clearer conceptualization of the theory under study. The hypothe-

sized model can then be tested statistically in a simultaneous analysis of the entire system of variables to determine the extent to which it is consistent with the data. If the goodness of fit is adequate, the model argues for the plausibility of postulated relations among variables; if it is inadequate, the tenability of such relations is rejected” (Ref. [36, p. 3].

Results

Sample characteristics

Demographic characteristics of the sample are displayed in Table 1. CLBP patients were older ($\chi^2=20.4$, $df=2$, $P<.001$) and had a lower social status than ($\chi^2=15.4$, $df=4$, $P<.01$) CPP patients and controls. These two variables were controlled in all of the correlational analyses; none of the calculations revealed any significant influence of age or social status.

Univariate analyses

While no significant differences among the three groups were found with regard to any sexual abuse in childhood, very severe sexual abuse was reported significantly more frequently by women suffering from CPP. Physical abuse occurred significantly more frequently in the two pain groups than in the control group.

No significant differences between the three groups occurred with regard to the total number of stressful life events, the number of highly stressful life events, and the sum score of distress caused by life events.

Pain patients showed significantly higher total depression scores as well as cognitive–affective depression scores as

measured by the BDI compared to the control group (see Table 2).

Interdependencies of pain, abuse, life events, and depression

Women who experienced severe childhood sexual abuse reported significantly more stressful life events (t test: $t=2.51$, $P=.014$) and a higher distress (sum score) caused by these life events (t test: $t=2.59$, $P=.019$); the same was true for women who experienced childhood physical abuse events ($t=2.28$, $P=.025$, and $t=2.65$, $P=.009$). These differences remained significant after life events mostly independent of the subject’s influence had been excluded (e.g., “death or illness of a family member or close friend”). Moreover, abused women showed higher cognitive affective depression scores (t test: severe childhood sexual abuse: $t=2.47$ $P=.025$; childhood physical abuse: $t=3.67$, $P<.001$). In addition, depression (cognitive affective factor) was significantly correlated to number of stressful life events ($r=.38$, $P<.001$) and distress caused by life events ($r=.26$, $P=.010$).

For the inclusion of variables in the SEM a combined theoretical and empirical approach was employed. It was the theoretical aim to include one variable from each domain: sexual abuse, physical abuse, life events, and depression, and to establish pain (both patient groups) as target variable. In a second empirical step, the variables “very severe childhood sexual abuse” and “childhood physical abuse” were chosen, because they showed significant differences between the groups in the univariate analysis. “Sum score of distress by life events” was included into the SEM, because it represents the most comprehensive variable for the assessment of life events. The “cognitive affective factor of depression” from the BDI was chosen in order to avoid

Table 2
Childhood sexual and physical abuse before the age of 15, stressful life events, BDI scores in different patient groups and controls

	CPP ($n=40-43$) ^a	CLBP ($n=38-40$) ^a	Controls ($n=22$)	
Sexual abuse				
Yes	11 (27.5%)	8 (20.5%)	5 (22.7%)	$\chi^2=0.55$, $df=2$, $P=.760$
No	29 (72.5%)	31 (79.5%)	17 (77.3%)	
Very severe sexual abuse				
Yes	10 (25.0%)	2 (5.1%)	3 (13.6%)	$\chi^2=6.20$, $df=2$, $P=.045$
No	30 (75.0%)	37 (94.9%)	19 (86.4%)	
Physical abuse				
Yes	25 (62.5%)	21 (44.7%)	6 (27.3%)	$\chi^2=7.32$, $df=2$, $P=.026$
No	15 (37.5%)	17 (55.3%)	16 (72.7%)	
Very severe physical abuse				
Yes	14 (35.0%)	10 (26.3%)	3 (13.6%)	$\chi^2=3.30$, $df=2$, $P=.192$
No	26 (65.0%)	28 (73.7%)	19 (86.4%)	
Number of stressful life events (mean/S.D.)	2.21/1.77	1.95/1.47	2.32/1.52	$\chi^2=1.15$, $df=2$, $P=.563$
Severe stressful life events (>28)				
Yes	15 (34.9%)	17 (42.5%)	11 (50.0%)	$\chi^2=1.43$, $df=2$, $P=.487$
No	28 (65.1%)	23 (57.5%)	11 (50.0%)	
Sum score of distress by LE (mean/S.D.)	55.8/54.5	44.4/41.6	56.0/39.7	$\chi^2=1.79$, $df=2$, $P=.410$
BDI sum score (mean/S.D.)	10.21/9.27	11.32/9.25	2.73/3.09	$\chi^2=21.96$, $df=2$, $P<.001$
BDI cognitive–affective factor (mean/S.D.)	5.51/6.71	6.22/5.58	1.55/1.65	$\chi^2=13.81$, $df=2$, $P=.001$

^a Varying numbers due to missing values.

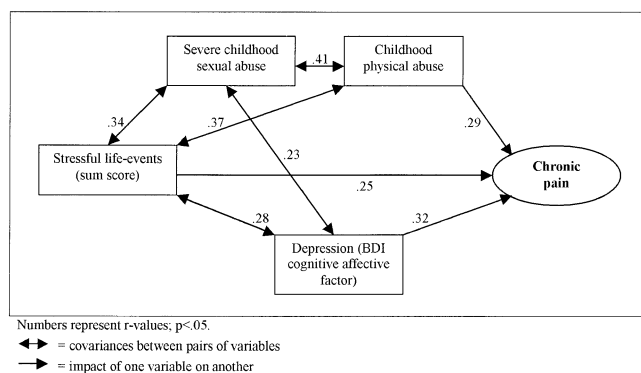


Fig. 1. Path diagram of SEM of correlations among pain (dependent variable), abuse, life events, and depression.

false positive depression scores through physical symptoms of the pain disorder.

Complex mutual relations between the five variables arose from the SEM; the model revealed a good fit for the data (comparative fit index: 1.0, discrepancy/df: 11.54) (see Fig. 1).

Childhood physical abuse, the sum score of stressful life events, and depression (cognitive affective factor of the BDI) showed a significant impact on the occurrence of chronic pain, whereas childhood sexual abuse did not. As far as covariances between pairs of variables are concerned, severe childhood sexual abuse correlated significantly with depression, but childhood physical abuse did not show such a correlation. Both types of abuse correlated with each other and with stressful life events. Stressful life events were also related to depression.

Discussion

In this study, complex mutual interactions among childhood victimization, depression, stressful life events, and occurrence of chronic pain in women could be demonstrated. The SEM revealed that childhood physical abuse, stressful life events, and depression are of significant impact on the occurrence of chronic pain. The SEM can be regarded as a causal model that gives hints at directional influences on the target variable (chronic pain), but does not provide proof of these interactions. This model reveals complex interactional patterns that cannot be detected by univariate analyses only. Thus, it can be hypothesized that the “systemic” interplay of the four psychosocial variables represents more of an effect on the occurrence of chronic pain than the sum of the single variables do.

Surprisingly, severe childhood sexual abuse did not seem to have a direct impact on chronic pain, whereas childhood physical abuse did. On the other hand, sexual victimization is related to depression while the experience of physical violence in childhood is not. This result might be explained by some further consideration: Severe childhood sexual abuse does not show a direct relationship with chronic pain in general, but women with CPP showed a significantly

higher rate of severe childhood sexual abuse. This result is in line with Walling et al. [4] who found a higher prevalence of major childhood sexual abuse in CPP patients than in women suffering from headache and a pain-free control group. Thus, sexual abuse in childhood may be regarded as a specific risk factor for the development of CPP. It could be hypothesized that sexual and physical victimization in childhood lead to different patterns of pathology in adult life, childhood sexual abuse being associated with CPP and depression, and physical abuse with other pain syndromes and with CLBP in particular. With the exception of the surprising lack of correlation between physical childhood abuse and depression that requires further investigation, the SEM confirmed the known relations between depressions and life events [37] and depression and pain [27].

The result that childhood sexual abuse is not linked directly to chronic pain in general confirms the data of Raphael et al. [16] who did not find such a relation with regard to documented childhood sexual abuse, whereas they did find such a correlation with regard to reported childhood sexual abuse. Unfortunately, Raphael et al. [16] did not report data of subgroups of patients with specific chronic pain syndromes. Had they done so, they might have found a correlation between documented childhood sexual abuse and CPP, as we found in our patients.

So far, a correlation between stressful life events and chronic pain could only be found in patients with functional pain [17–20]; our results suggest a significant relationship between stressful life events and chronic pain of functional and organic etiology, but only if this correlation is viewed as part of the complex interplay between the psychosocial variables and pain. It could be hypothesized that patients with functional pain syndromes represent a subgroup of pain patients that have experienced childhood victimization more frequently than those with mainly organic etiology of pain. This interpretation is in line with the findings of Drossmann et al. [3] who found a significantly higher rate of physical and severe sexual childhood abuse in women with functional gastrointestinal pain compared to women with organic disease diagnoses.

The strong relationship between both childhood sexual and physical abuse and the experience of stressful life events in adult life can be regarded as another part of the mutual interplay of variables. Several reasons can be given for this correlation: (a) childhood abuse most likely leads to an increased vulnerability to psychosocial stress, i.e., life events occur more often and are experienced as more stressful; (b) growing up in an abusive atmosphere may lead to a decreased “quality” of relationships in later life that go along with an increase in stressful life events on the basis of relational conflicts; (c) individuals who have been exposed to physical and sexual childhood abuse may have impaired coping abilities and, therefore, perceive life events as more stressful.

The major limitation of this study is its cross-sectional design that does not permit establishing causal relation-

ships. However, the use of SEM provides hints with regard to such relationships. Another obstacle is the omission of psychological abuse and emotional neglect in investigating childhood adversities. Recent studies have provided evidence that these variables can also have some impact on the development of adult pathology [38]. Future investigations will have to include these variables. It should also be taken into consideration that the assessment of depression by means of a questionnaire does not allow diagnosis of different types of depression, such as major depression or dysthymia; this would only be possible by performing diagnostic psychiatric interviews. In contrast, the extensive and differentiated interview procedure employed to assess childhood abuse and life events can be regarded as a strength of this investigation.

In conclusion, our results confirm the importance of the association between adverse childhood experiences, especially sexual and physical abuse, and the occurrence of chronic pain in adult life. While trying to understand the relationship among chronic pain, childhood victimization, life events, and depression, it is essential to pay attention to the mutual interplay of the psychosocial variables in the development of pain and not to restrict the investigation to univariate analyses. Future studies are needed to investigate these complex interactions in populations with different pain syndromes and male subjects.

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