Prevalent pain and pain level among torture survivors

A follow-up study

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ABSTRACT

Aim: To estimate change over nine months and over two years, as concerns the prevalence and level of pain in the head, back and feet, among previously tortured refugees settled in Denmark, and to compare associations between torture methods and the prevalence of pain at baseline and at follow-up.

Methods: Sixty-nine refugees previously exposed to torture in their home country were interviewed at a Danish rehabilitation clinic. Fifty-four accepted to be re-interviewed after nine months, and 47 were interviewed again 14 months later. Interviews focussed on the history of exposure to physical and mental torture and on pain in the head, back and feet at baseline and at follow-up.

Results: The mean cumulative duration of imprisonment was 1.7 years, and on the average more than 10 years elapsed between torture and examination. The most frequent physical torture method reported was beating (97%), whereas the main mental torture method was threats of death (97%). The prevalence of pain reported at the follow-up interviews did not differ significantly from that reported at baseline (pain in the head, 81% at baseline and 77% at 23-month follow-up; back, 78% and 81%; feet, 59% and 70%). The same pattern was found when examining the level of pain as indicated by Visual Analogue Scales. Pain in the feet at follow-up was associated with previous exposure to beating against the feet. Pain in the back at baseline and pain in the head at follow-up were associated with suffocation.

Conclusion: More than ten years after the torture took place, survivors of torture continue to suffer from pain associated with the type of torture they had been subjected to. This presents a considerable challenge to future evidence-based development of effective treatment programmes.

Pain of the musculo-skeletal system (prevalence up to 48%), headache (38-50%), pain in the back (up to 43%), pain in the feet (19-28%), and joint pain (19-43%) are examples of frequently reported somatic symptoms among previously tortured refugees (1-3). Published studies on the association between refugees' health and exposure to violence and torture are mainly cross-sectional and the time from exposure to violence till examination thus varies among included refugees. Such studies have documented a high prevalence of mental (4, 5) as well as somatic (1-3, 6) complaints associated with the exposure, even if it happened many years before study.

The published literature based on follow-up designs is, however, extremely scant. We were only able to identify four studies involving cohorts of persons previously exposed to conditions of war, organised violence and torture, with the aim to describe the course of the symptoms. Three of these studies (7-9) dealt with mental symptoms, which were followed-up after three years. In the fourth study, Hermansson et al (10) followed a group of 44 war-wounded refugees for eight years and found that about ¾ had chronic pain at follow-up as compared to less than ⅔ six years before. The increasing prevalence found may indicate either a less outspoken contact with the health care system or a lack of curative success, or it may be an effect of selection for study participation. Moreover, as we have not been able to identify any randomised controlled studies focussing on the treatment of torture victims' somatic symptoms, a possible effect of curative or rehabilitative interventions still seems undocumented.

In accordance with the overwhelming need for basic scientific documentation on the course of somatic symptoms, the aim of the present study was to estimate the change over approximately two years as concerns the prevalence and level of pain in the head, back and feet among previously tortured refugees, and to identify and compare associations between torture and the pain reported at the initial contact with a rehabilitation clinic, and pain prevalent nine months and two years later.

MATERIAL AND METHODS

PARTICIPANTS

The study includes 97 refugees who were consecutively accepted for examination at the Rehabilitation and Research Centre for Torture Victims (RCT), Copenhagen, Denmark from 1 January 2001 to 15 May 2002. The refugees were referred to RCT by their general practitioner. Nineteen (20%) turned out not to have been exposed to torture previously, six refugees (6%) refused to participate and three were excluded because of incomplete data, which left 69 (71%) participants for the baseline interview. Of the 69 refugees one (2%) died during the follow-up period, 11 (16%) refused further participation and another three (4%) refugees were excluded because of incomplete data, which left 54 (78%) participants for the first follow-up interview. Of these 54 refugees 47 (87%) participated in the second follow-up interview (five (9%) refused to participate and two (4%) were excluded because of incomplete data).

Participants of the baseline interview differed significantly from non-participants as concerns the distribution of gender (82% male vs. 35% female participated, $OR_{\text{male gender}}$ 8.80, $p<0.001$), whereas no significant difference was found as concerns age. Relatively frequent participation (at baseline interview, 81%, OR 5.27, $p<0.001$; at first follow-up interview, 85%, OR 6.53, $p<0.01$) was found among refugees who, after the initial examination, were offered treatment at the RCT. Refugees who reported headache at the first follow-up interview participated frequently in the second follow-up interview (participation 93%, OR 6.50, $p<0.05$).

DATA

Demographic data (age, gender and present citizenship) and data on previously experienced traumatic conditions and events (arrest and detention, exposure to torture, living under conditions of war, serving as a soldier at war, being a refugee in the home country, residing in a refugee camp, being subjected to house search) were collected at the RCT examination by a specialist in psychiatry with special expertise in examining torture victims. Information on the refugee's physical health was collected by three interviews: (a) a baseline interview and (b) on the average 9.2 months (range 7-15) and (c) 22.9 months (range 20-25) thereafter. The repeated pain questionnaire included pain in the head, back and feet during the preceding 24 hours and the pain level "most of this time span" in the three loci, measured by a Visual Analogue Scale (VAS) ranging from 0 (no pain) to 100 (worst conceivable pain). Authors DRO and JC collected the baseline and 9-month data, and a bilingual (Danish and Arabic) research assistant collected the 23-month data, in both instances supported by an interpreter when necessary. All data were collected by use of assisted self-administered questionnaires developed for the study. Questionnaires were translated and back translated into Arabic and Persian by bilingual interpreters; oral translation was used for other languages.

ANALYSIS

To examine changes in proportions of prevalent pain, McNemar's χ^2-test for two dependent groups was used, and Wilcoxon Signed Ranks Test was applied to test changes in VAS-scores between the three interviews. Furthermore, the statistical analysis applied χ^2 tests for the 2×2 table and Odds Ratio (OR) estimation and bivariate and multiple logistic regression to identify associations between exposure to torture and pain.

Information on pain in the head, back and feet, prevalent at the three interviews, functioned as dependent variables. Two different types of relationships were analysed: (a) the association between independent dichotomous torture variables and pain (presented in tabular form), and (b) the association between independent continuous torture variables and pain (significant results presented in text). To avoid overloading of the models, the number of candidate predictors for multiple regression was reduced by use of the bivariate analyses, so that only variables significant at $p<0.10$ level were included in the multiple regression. Furthermore, indicators of torture previously documented to be associated with pain were included (11). To adjust for confounding, age, gender and – in order to correct for cultural variation – present citizenship were included in all multiple regression analyses. The χ^2 distributed Wald statistic was used as significance test in the analyses, and $p<0.05$ was applied as final level of significance. Model fit was estimated by use of the Hosmer and Lemeshow statistic (12).

The project complies with the Helsinki II declaration. Participants signed an informed consent form. The Regional Committee for Ethics in Medicine and the Danish Data Protection Agency approved the study and its database.

Table 1. Previous exposure to torture and other traumatic events, in 69 clients at the Rehabilitation and Research Centre for Torture Victims, Denmark, 2001-2004.

	Clients	
Torture and traumatic events	**no.**	**%**
Physical torture method		
Beating	67	97
Beating of the head	63	91
Beating of the soles of the feet (falanga)	49	71
Beating of the ears (telephono)	43	62
Electricity	42	61
Forced positions	42	61
Suspension in upper extremities	40	58
Suspension in lower extremities	29	42
Burning	26	38
Suffocation	25	36
Non-physical (mental) torture methods		
Threats of death	67	97
Isolation	58	84
Threats of death of family	55	80
Witnessing torture of other persons beside family	45	65
Mock execution	37	54
Witnessing torture of family	25	36
Sexual torture	12	17
Other traumatic experiences before arrival to Denmark		
Being subject to house search by armed forces	63	91
Living under conditions of war or armed conflict	62	90
Being a refugee in the home country	57	83
Being a soldier at war or armed conflict	34	49
Residing in refugee camp	21	30

RESULTS

DEMOGRAPHIC INFORMATION

Of the 69 tortured refugees, 61 (88%) were male and eight (12%) were female. The mean age at initial contact was 38.4 years (range, 19-66 years). Thirty-three refugees (48%) had present citizenship in Iraq (Denmark, 15 refugees (22%); Afghanistan, six (9%); other citizenship, 15, (22%)).

HISTORY OF IMPRISONMENT AND TORTURE

The mean number of years imprisoned was 1.7 (range, 0-14 years), and the mean duration from the final release to the examination at RCT was 10.6 years (range, 1-27 years).

Before emigration more than nine out of ten had their home searched by armed forces, and nearly half of the refugees had been soldiers at war or armed conflict (Table 1). Almost all had been exposed to beating and more than half to forced positions (e.g. cramped confinement in a cage) and electrical torture. About one third reported burning and suffocation. Also more specific loci like beating of the soles of the feet (falanga) were experienced by most of the refugees. As concerns mental torture methods, nine out of ten reported threats of death, and nearly two thirds had witnessed the torture of fellow prisoners.

PREVALENT PAIN AND PAIN LEVEL

No significant difference was found as concerns reporting of pain at the three interview times, neither in the head, back nor feet (Table 2). Thus, 77% reported pain in the head at the 23-month follow-up vs. 81% at baseline interview ($p=1.000$); 81% reported pain in the back at 23-month follow-up vs. 78% at baseline ($p=1.000$), and 70% reported pain in the feet at 23-month follow-up vs. 59% at baseline ($p=0.092$).

As indicated by use of VAS, no significant pain level difference was found between baseline and follow-up in any of the three loci of the body (Table 3). Thus, the mean VAS-score for pain in the head was 52 at 23-month follow-up vs. 58 at baseline ($p=0.317$); for pain in the back the mean was 54 at 23-month follow-up as contrasted to 61 at baseline ($p=0.107$); and the mean VAS-score was 46 for pain in the feet at 23-month follow-up vs. 44 at baseline ($p=0.403$).

TREATMENT

Of the 69 refugees interviewed at baseline, 58 (84%) were offered and received a multidisciplinary treatment at RCT consisting of individually adjustable medical assistance, physiotherapy, psychotherapy and social counselling.

PREVALENT PAIN AND IMPRISONMENT AND TORTURE

Based on multiple regression, pain in the head at 9-month follow-up was found to be positively correlated with previous exposure to suffocation during torture (Table 4). Pain in the head was un-associated with other indicators of torture, such as, the number of torture methods, duration of imprisonment, and duration from final release to examination.

Also pain in the back reported at baseline was found to be asso-

Table 2. Prevalence of pain during the preceding 24 hours in the head, back and feet, at baseline and 9- and 23-month follow-up, in 69, 54 and 47 clients, respectively, at the Rehabilitation and Research Centre for Torture Victims, Denmark, 2001-2004.

	Pain at baseline (N=69)		Pain after 9 months (N=54)		Pain after 23 months (N=47)		Comparison of prevalence		
Locus of body	**no.**	**%**	**no.**	**%**	**no.**	**%**	**baseline vs. 9 months P***	**9 months vs. 23 months P***	**baseline vs. 23 months P***
Head	56	81	42	78	36	77	1.000	0.508	1.000
Back	54	78	42	78	38	81	1.000	0.687	1.000
Feet	41	59	36	67	33	70	0.180	0.607	0.092

*) Based on McNemar's test for proportions in two dependent groups.

Table 3. Level of pain* in the head, back and feet at baseline and 9- and 23-month follow-up, in 69, 54 and 47 clients, respectively, at the Rehabilitation and Research Centre for Torture Victims, Denmark, 2001-2004.

	Level of pain at baseline (N=69)	Level of pain after 9 months (N=54)	Level of pain after 23 months (N=47)	Comparison of level:		
Locus of body	mean	mean	mean	baseline vs. 9 months P**	9 months vs. 23 months P**	baseline vs. 23 months P**
Head	58	54	52	0.870	0.143	0.317
Back	61	54	54	0.207	0.717	0.107
Feet	44	46	46	0.300	0.667	0.403

*) Pain "most of the time" during the preceding 24 hours, as indicated by a Visual Analogue Scale (VAS) ranging 0-100.
**) Based on Wilcoxon Signed Ranks Test for two dependent groups.

Table 4. Risk estimates (odds ratio, OR, with 95% confidence limits)* of pain in the head, back and feet prevalent during the preceding 24 hours at baseline and 9- and 23-month follow-up, by exposure to torture, in 69, 54 and 47 clients, respectively, at the Rehabilitation and Research Centre for Torture Victims, Denmark, 2001-2004.

	Baseline (69 clients)		9 months (54 clients)		23 months (47 clients)	
Significant predictors	OR	$CI_{95\%}$	OR	$CI_{95\%}$	OR	$CI_{95\%}$
Pain in head[1]						
Suffocation	0.6	0.1-3.6	38.6[a]	1.5-1008.6	2128.2	0.2-∞
Pain in back[2]						
Suffocation	7.2[a]	1.0-51.9	8.7	0.9-84.4	22.0	0.9-555.2
Pain in feet[3]						
Suffocation	2.0	0.6-7.4	44.5[b]	2.2-902.4	4.4	0.6-31.5
Beating against the head	1.4	0.1-14.6	121.5[b]	2.3-6416.1	2.0	0.1-44.9
Beating against the feet	3.7	0.8-18.1	0.4	0.0-5.0	44.7[b]	1.7-1204.5
Mock execution	2.9	0.8-11.0	7.1[a]	1.0-49.3	1.2	0.2-8.9

*) Multivariate estimates by use of multiple logistic regression corrected for age, gender and present citizenship. Estimates of torture are presented, if they were significant in a minimum of one of the follow-up interviews.
a) $p \leq 0.05$.
b) $p < 0.025$.
1) Model fits: baseline, $p > 0.10$; 9 months, $p > 0.20$; 23 months, $p > 0.80$.
2) Model fits: baseline, $p > 0.40$; 9 months, $p > 0.10$; 23 months, $p > 0.20$.
3) Model fits: baseline, $p > 0.90$; 9 months, $p > 0.80$; 23 months, $p > 0.10$.

ciated with suffocation (Table 4) and – in separate analyses with continuous independent variables – with the number of torture methods exposed to (OR 1.3 per method, $p<0.025$). Pain in the back at 9-month follow-up was negatively correlated with the duration of imprisonment (OR 0.7 per year, $p<0.05$).

At baseline, pain in the feet was un-associated with indicators of specific torture methods. As reported at 9-month follow-up, pain in the feet was strongly associated with suffocation and beating against the head and less strongly with mock execution (Table 4). At 23-month follow-up, pain in the feet was significantly associated with previous beating against the feet. Moreover, in the separate analyses with continuous independent variables, pain in the feet reported at baseline and at 23-month follow-up was significantly associated with duration from final release to examination (OR 1.1 per year, $p<0.025$ and OR 1.1 per year, $p<0.05$, respectively). At 9-month follow-up, pain in the feet was positively associated with the number of torture methods (OR 1.3 per method, $p<0.05$).

DISCUSSION

Considering the continuing high incidence of torture in many countries of the world (13), and the prevalence of previous exposure to torture among refugees arriving in Western countries (14-16), the almost total lack of published scientific research focussing on the natural history of health problems following exposure to torture – not to mention the shortage of scientific effect studies – may appear paradoxical. The focus of the present non-experimental study is therefore a mapping of the long-term course of somatic symptoms in torture victims.

The study involved 69 refugees previously exposed to torture mainly in the Middle East. Consequently, results from the study cannot be generalised to other refugee populations without hesitation. Moreover, the participants represent a selected part of the total torture victim population from the countries in question: they survived torture; they escaped or were released from prison; they managed to emigrate from their home country; they were granted asylum in Denmark; and finally they were referred to and accepted for an examination at the RCT, Copenhagen. Accordingly, results cannot be generalised to, e.g., populations of torture survivors continuing to reside in the home country. Such a potential of complicated selection biases is, however, necessarily inherent in the major part of empirical research concerning refugee populations in Western countries, when it focuses on long-term consequences of torture.

The size of the study population was rather small, and the drop-out considerable. Moreover, pain having been observed by use of an identical technique at baseline and at follow-up denotes strength of the study. Furthermore, the intensity of pain was translated to VAS-scores by the client, indicating that most of the reported pain was not negligible. The present observation of continuation of prevalent pain is parallel to the findings among victims of war in the study by Hermansson (10).

Torture survivors may suffer from impaired memory (17, 18), so that concrete details of exposure to torture may be obscure. Moreover, in everyday practice, being ashamed and feeling guilty have presented themselves as – paradoxical – mental sequelae, and in general a not negligible degree of trust will thus be needed for the victim to share the torture experience with other persons (19). This may have influenced the precision of the present information, especially as concerns the type and number of torture incidents reported, enhancing under-reporting rather than over-reporting and possibly leading to bias towards the null-hypothesis. This hesitation especially regards reports of mental, not least sexual torture. The precise impact on associations cannot be estimated readily.

According to the International Association for the Study of Pain, pain is defined as: "An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage"(20). Persisting pain may well be explained by modern pain theory; possible pain-generating mechanisms are constituted by persisting peripheral injury in the tortured region and persisting peripheral or central sensitisation ("pain memory") as well as somatisation phenomena (21, 22) Permanent structural

changes in pain-generating structures may be the result of beating a locus of the body, as this makes permanent impulse-generation likely, which in turn may lead to a neuropathic pain condition. Central sensitisation ("pain memory") would not need an ongoing process in the periphery to generate a pain experience, and it is possible that both regional and generalised pain conditions can be precipitated through such mechanisms. The term "somatisation" refers to a condition characterised by physical symptoms without an adequate organic or patophysiological explanation. The term is descriptive and does not in itself imply any causal inference (23). Pain may originate from experience of severe stress (24) and lack of control (25).

In the present study, pain in the head, back and feet was found to be associated with exposure to suffocation. In a descriptive study of 18 torture survivors (26), 1/3 of the examined persons had been exposed to asphyxia/submersion, and they reported pain in the head, the low back and the lower limbs. Regardless of whether suffocation is carried out by preventing the victim from breathing by covering his or her face with a plastic bag or by submerging the victim's face in fluid, perpetrators can easily exceed the physical limits that a person can tolerate without air and produce cerebral anoxia, which subsequently may lead to cerebral damages (27-29), and, potentially, to injury of the pain-perceiving parts of the central nervous system. Moreover, emotional distress may elicit sympathetic nervous system discharge resulting in increased muscle tension (21). Following this, pain may become a stressor in itself.

Association of pain in the feet with previous exposure to falanga has been found in only one previous study (1). In our study, exposure to mock execution also predicted pain in the feet, which may indicate a somatising effect, or it may be the result of unveiled exposures. However, overemphasising the mental aspects may result in an imprecise pain diagnosis and thereby less specific and less effective treatment.

The mere amount of exposure to torture was found to be of importance, i.e. the number of torture methods was a positive predictor of pain in the back and pain in the feet. The duration in years from the final release from confinement – and thus from exposure to torture – to examination predicted increased pain in the feet, and this may indicate not only a possible age effect but also a need for early intervention to prevent further pain development. No randomised controlled studies focussing on the treatment of torture victims' somatic symptoms could however be identified to support this.

In multiple regressions, the probability of reporting pain presented itself as a function of rather complicated determinant patterns. When interpreting these patterns one should bear in mind the rather small sample size and the considerable, unavoidably selective dropout. The fact that most significant associations were present at follow-up but not at baseline could be due to dropout over time, which may have introduced a selection bias away from the null hypothesis.

The present results underscore the necessity of the application of strict scientific approaches in the development of curative and rehabilitative interventions targeting torture victims: the symptom prevalence was unchanged in spite of the fact that more than 80% of the refugees underwent comprehensive treatment at the RCT, and the remaining 20% may have been offered treatment at other Danish centres. In the absence of scientific experimental evidence of effect it is, however, not possible to estimate whether the found unchanged prevalence would have been higher without treatment. Considering the high symptom prevalence, it suffices to state that evidently treatment has not substantially reduced the victims' long-term risk of continuing symptoms of pain. Disappointing as this may be, it still remains an open question whether pain following exposure to a varied pattern of torture is actually amenable to any known curative procedure.

In conclusion, in spite of many factors being potentially co-responsible for prevalent pain more than ten years after the torture took place the torture presents itself as associated with specific localisations of pain, with general processes and with potentially somatising processes. This constitutes a considerable challenge to the evidence-based development of effective treatment programmes in the future.

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