

# Causal Relation of Psychological Stress to Acute Back Pain

## Příčinný vztah psychického stresu k akutní bolesti zad

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### ABSTRACT

#### PURPOSE OF THE STUDY

There is a known relation between the chronic back-pain-syndrome and psychological problems. We suppose a direct causality between acute stress and onset of the backpain syndrome.

#### MATERIAL AND METHODS

A prospective cohort-study (IV/2014 - VIII/2014) of patients who came to our emergency department with acute back-pain-syndrome, with no relevant previous history – such as operations or chronic pain. We questioned together 39 patients (19 female and 20 male). The patients filled in two charts: FW7, and also a modified HADS-D. In the later one the patients were questioned in two extra points regarding contingent excessive emotional or existential problems in their brief history. The Pain-Severity-Score was assessed as well.

#### RESULTS

Combined together, relevant score-results and / or anamnesis of excessive emotional or existential problem was found in 79.5% (SD 0.4%) of the whole cohort.

#### CONCLUSIONS

This could have implications for guidelines, introducing the psychotherapy-first into the concepts.

**Key words:** stress; well-being; depression; back-pain-syndrome.

### INTRODUCTION

There is a known relation between the chronic back-pain and psychological problems, published in countless works throughout the literature (1, 2, 5, 8, 9). We suppose rather a direct causality between acute stress and onset of the back-pain. The stress through the muscle-dysbalance can lead to protrusions and prolapses of intervertebral discs. These should be viewed not only as secondary changes, but as reversible as well.

### MATERIAL AND METHODS

A prospective cohort-study (IV/2014–VIII/2014) of patients who came to our emergency department with acute back-pain, without previous history – such as surgery or chronic pain. Aside the routine diagnostic procedures, such as X-ray and usually abdominal sonography (3, 6), the patients filled in two charts: FW7, and also a modified HADS-D (Hospital Anxiety and Depression Scale).

In the later one we questioned in two extra points eventual contingent excessive emotional or existential problems in the patient's short history, for a better com-

pliance without any precise details. These both points were evaluated as an extra parameter, apart of the HADS-score.

For the statistical analysis we used the program BIAS-11.01.

As mentioned, patients with a relevant history, such as previous operations, protrusions or in-patient treatment, were from our study excluded. The further clinical courses among our patients varied widely, from a single outpatient treatment session by one, to multiple operations in another case. Anyway, this was of no relevance for our evaluation and we focused on the charts given.

### RESULTS

We questioned from April 2014 till August 2014 together 43 patients (23 Male, 20 female). Though, after more exact query we found in 4 cases (3 male / 1 female) previous history of spinal surgery and chronic back pain. These patients were not taken into our further analysis. After all we analyzed the charts of 19 female and 20 male patients. The age median was 42 years, the average age of 40, SD 13.8 years.

The average **HADS-D-Score** within our cohort came up for 11.5 points, with median of 11 and SD 6.4 points. The cut-off for anxiety or depression is considered the sum of 11 points, by maximal amount of 42 points. Over this level occurred to lie 51% of our patients (20), SD 0.5%.

Exactly 21 (54%, SD 0.5%) of the patients answered the **two extra questions** about an acute profound existential or emotional distress / problem in the time being positively. Outside this subgroup the average HADS-D-Score came up to 9.55 points, with median of 8.5 and SD 4.62 points. Among the patients with such an acute distress we found the HADS-D-Score of 13.25 points, with median of 11 and SD 7.2 points.

The overlapping between the subgroup with such a major stress event and the subgroup with the HADS-D-Score over 11 makes up to 60% (12 from 20 / 21 respectively), representing about 30% of our cohort. On the other way, these both groups together make up to 74% (SD 0.4%) of the whole cohort.

The average **FW7-Score**, representing the acute patient's well-being, came up for 28 points, which makes about 2/3 of the maximum 42 points, with a median sum of 30 and SD of 9 points. The relevant score-reduction of 30% was found at more than 42% of the patients (16), with SD of 0.5%.

The correlation between HADS-Score and FW7-Score was 0.6818 (Pearson), hence the depressive mood and acute well-being seem to be tightly related to one another. Anyway, the presence of some acute existential or emotional problem and the FW7-Score correlated rather poorly (0.2313 Pearson), the same with the HADS-Score (0.1266).

Indeed, combined these three subgroups together, i. e. some profound existential or emotional problem (major stress event), with the group of HADS-Score over 11 and the one with relevant FW7-Score, we came up to **79.5% (SD 0.4%) of the whole cohort**.

The average **Pain-Severity-Score** made about 5.27 points, with median of 5 and SD 1.36 points. The correlation of the pain-severity and the FW7-Score came up rather weakly (0.1024 Pearson), as well as of the HADS (0.1255). The actual pain-intensity seems to stay aside from the subjective well-being or depressive mood, with almost no mutual interference. The gender- and age-related subgrouping shows 6 female patients in their 20s, 8 in the 4<sup>th</sup> and 6 in their 6<sup>th</sup> decennial. In the male subgroup we found 5 patients in their 20s, 6 in the 30s and 8 in their 40s. We found no male patients in the 6<sup>th</sup> decade of life (Fig. 1).

Among the male patients in their 40s, together 6 answered the extra questions about some recent overwhelming existential or emotional problem positively, i. e. 75%. Within the 20s male group we found this phenomenon in 50% and among those in their 30s by four patients, hence 2/3 of the subgroup. Within the female patients group in their 20s we found such a positive answer by five, making up 83%. In the subgroup about their 40s there were three patients, summing up to 38%. Within the female subgroup of the 6<sup>th</sup> decennial

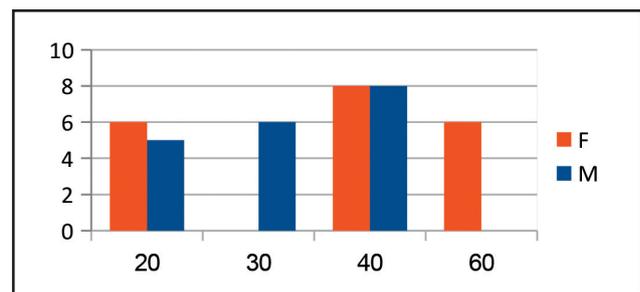


Fig. 1. Gender and age distribution of our cohort.

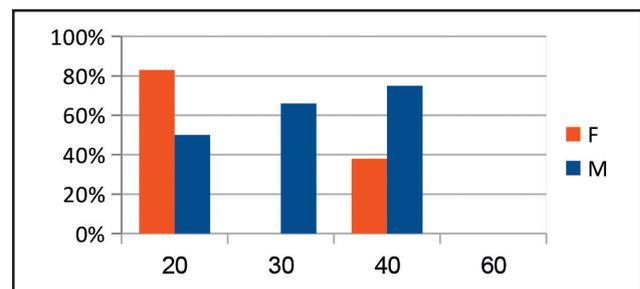


Fig. 2. Numbers of patients with an existential or emotional problem in gender / age groups.

we found no one with a major stress event or problem in their history (Fig. 2).

## DISCUSSION

Despite rather small numbers we could identify the stress, reflected in FW7 / HADSD-Scores, and the presence of an overwhelming event in the patient's short history as significant moments for the acute back-pain. All these summed up in 80% of our cohort and thus a direct causality in the pathogenesis can be postulated. The both most prominent factors combined – an overwhelming stress event in the short previous history and depressive mood – were present in 74% of our patients.

The lifelong prevalence of depression in the general population is discussed in about 11.6% (4). The overall yearly prevalence of a major stress event for the whole western population is not exactly known, in one study it was found in 36.3% subjects from among 2,262 participants (7). This study addressed the stress as a relevant factor for the type 2 diabetes.

Even more visible is the stress-event distribution throughout the age subgroups. In the male cohort there were its quota of 50, 66 and 75% in the patient's history found. In the female age subgroups the existential pressure appears to follow the reversed order, with 83, 38 and 0%.

The spondylophytic or degenerative disc alterations are in the younger age groups around 2<sup>nd</sup> decennial quite unlikely. Our findings reflect rather the generally known age-specific life-phase stress-burden.

On the other hand, in the female subgroup of 60's could evenly be the chronic degenerative tissue-changes

of the spinal column viewed at as the causal factor (20%). Interestingly, the average HADS-D-Score in this subgroup was 8, with SD of 4.4 and median 7 points, suggesting rather an emotionally stable life-phase. In this subgroup was depressive score of 17 points found in only one single patient (< 2%). Moreover, we found no patient with history of acute overwhelming existential or emotional stress in this particular subgroup.

Remarkably, we found in the female group of 20's HADS-D-Score of 16, with SD 7.5 and median of 15.5 points. Combined with above mentioned stress-burden distribution, seems this to be quite a difficult phase of life. The average FW7-Score within this subgroup was 27 points, making up 60% of the possible maximum.

In the remaining subgroups were the HADS-D-Scores about 11.5 points found, hereto FW7-Score remained more-less constant throughout the whole cohort with about 28 points, i.e. 2/3 of the possible maximum, with SD of 9.

We consider the acute well-being of our cohort generally reduced, in average over 30%. The diminished well-being (FW7) does not seem to be due to pain-stimuli, at least we found almost no correlation with the pain-severity and this can be said about HADS-D-Score as well. In the same manner we found just mild correlation between the overwhelming stress history and FW7 / HADS-D-Scores. All these entities can be viewed at as virtually independent from each other.

## CONCLUSIONS

Our brief study is not the only one pinpointing the stress or overwhelming events in general as pathogenetic factors for a particular disease and should in spite of relevance of issue be proceeded with a further multicentric study. The results could bring in new guidelines, introducing the psychotherapy as first-line treatment into the whole concept.

### *Compliance with Ethical Standards*

*Funding:* This study was not funded by anyone

*Conflict of interest:* We (all authors) declare that there s has no conflict of interest.

*Ethical approval:* All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

*Informed consent:* Informed consent was obtained from all individual participants included in the study.

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