Psychological Factors in Chronic Pain Patients Waiting for Motor Cortex Stimulation

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Summary
Aim of this study was to evaluate if neurosurgical motor-cortex stimulation produce variations in personality traits, as assessed by Minnesota Multiphasic Personality Inventory 2 (MMPI-2), Clinical Depression Questionnaire (IPAT-CDQ) and Anxiety Scale Questionnaire (IPAT-ASQ) in functional chronic pain syndrome (CPS) subjects. Seven pharmaco-resistent patients affected by CPS waiting for motor-cortex stimulation and a control group of six patients, admitted at the Neurosurgery Department, were considered in this study. Pre-Post assessment were performed for experimental group. Only pre-treatment assessments were performed in control group. Factorial and repeated measures Anovas were used for confrontations. In experimental group, compared to control group, Pre-treatment assessment showed high levels of Anxiety and pathological scores to Hs, D and Hy MMPI-2 scales. In the experimental group, Post-treatment showed a small decrease in the same scales. Notwithstanding the treatment seems produce slight variations on clinical scales, the personality pattern of chronic pain patients remains relatively stable.

Introduction
The benign Chronic Pain Syndromes cause important modifications in quality of life of affected patients. They are analysed from a psychiatric point of view: some Authors report different psychiatric comorbidity linked to specific localizations of pain; others Authors describe the different typologies of the pain syndromes like a unique frame of functional pain[1]. In this perspective Fibromyalgia, Irritable Bowel Syndrome, tension headache and temporomandibular disorders are seen primarily as result of an lowering of the threshold to nociceptive imputs due to an alteration of central nervous processing. In a national representative sampling[2] significant positive links were found between a chronic pain condition and mood or anxiety disorders, specifically with panic disorder and post-traumatic stress disorder. However the presence of a psychiatric disorder was not significantly associated with pain-related disability, but the presence of multiple psychiatric disorders was significantly associated with increased pain-related disability. Other studies show a high association between headache and chronic psychiatric disorders specifically patients with headache show a high incidence of depressive episodes, dysthymia and generalised anxiety disorder[3].

The comorbidity between chronic pain and Borderline personality disorder was explored[4] in a sample of 17 patients with various pain syndromes. In this group the 25% of the patients was affected by borderline personality disorder. The personality of subjects with chronic pain syndrome was explored also from a psychological point of view. A lot of studies assessed the personality of this patients by clinical scales of Minnesota Multiphasic Personality Inventory 2 (MMPI-2). Obtained results show high scores for Hysteria, Hypocondriasis and Depression scales[5-7] also in patients without psychiatric disorders. Numerous studies demonstrated a strong association between chronic pain syndrome and alterations of the personality of the patients. This evidence supported a theoretical model, the diathesis-stress model, where the pre-existing personality of the patients is exacerbated by stress of the chronic pain resulting in diagnosable psychopathology[8]. A recent perspective longitudinal study confirms this theoretical model on a large sample of students followed for thirty years. High scores of Masculinity / Femininity in males, Paranoia in females, Hypochondriasis and Hysteria in both, measured by MMPI, predicted increases in number of chronic pain syndromes during the following thirty years[9]. In order to test whether chronic pain patients have a specific pattern of personality we compared a chronic pain syndrome group with a acute pain patients group.

Secondary in order to test whether a treatment of Epidural Motor Cortex Stimulation produce a significant variation of personality pattern in chronic pain patients, we retested these subjects after surgical treatment. In the end we compare the post-test chronic pain group with the acute pain group in order to evaluate if the outcome of the treatment should have reduce the difference in personality pattern of the two groups.

Materials and Methods

Seven pharmaco-resistent patients (5 males and 2 females; mean age: 54 years sd: 14 years) affected by functional chronic pain syndrome (experimental group) participated to present study. They showed clinical requirements for Epidural Motor-Cortex Stimulation. Moreover they were free from psychiatric disorders previously diagnosed. They were evaluated by the following protocol: Clinical Interview, Minnesota Multiphasic Personality Inventory 2 (MMPI-2), Clinical Depression Questionnaire (IPAT-CDQ) and Anxiety Scale Questionnaire (IPAT-ASQ) in order to measure personality traits, anxiety and depression levels. After this evaluation the subjects underwent transcranial epidural electrical stimulation over the cerebral motor cortex. The experimental design included a pre-post treatment assessment. Four of the seven patients were retested. Six patients (matched for age and gender) affected by pain lasting less than six months and related to identified cause, five for discal hernia and one for POS, were chosen like control group. All the thirteen patients were admitted at the Neurosurgery Department. ANOVA (factorial and repeated measures F Fisher Test) was used to test the hypothesis.

Results

Three tables are reported in order to test the three points of the hypotheses. In Table 1 the comparison between the chronic pain g0roup and controls is reported.

Table 1. Factorial ANOVAs, chronic pain syndrome group vs acute pain group on ASQ, CDQ and MMPI-2 scores (Means and Standard deviations are reported).

		ASQ	***CDQ***	***MMPI-2 SCALES (pathological cut-off: over 65)***											
		STEN	*STEN*	*L*	*F*	*K*	*HS*	*D*	*HY*	*PD*	*MF*	*PA*	*PT*	*SC*	*MA*	*SI*
CHRONIC PAIN GROUP (N: 7)	***Mean***	7.4	7.4	49,7	71,9	47,0	85,3	74,6	77,4	52,6	58,1	57,9	61,6	63,9	55,1	57,7
	Standard Deviation	±1.9	±2.2	±10,0	±20,7	±2,9	±12,7	±13,9	±14,2	±15,6	±6,7	±12,5	±16,9	±17,2	±8,2	±8,0
ACUTE PAIN GROUP (N: 6)	***Mean***	5.0	6.0	53,2	54,2	47,2	60,7	51,8	53,0	45,8	54,2	50,7	49,0	52,0	53,8	53,5
	Standard Deviation	±1.7	±1.7	±8,2	±8,1	±13,3	±11,8	±9,1	±10,4	±13,8	±7,5	±10,2	±7,0	±4,0	±15,0	±7,3
	F (1, 11):	***5.9***	1.7	0.4	0.4	0.0	***12.9***	***11.7***	***12.1***	0.7	1.0	1.3	2.9	2.7	0.0	1.0
	P value:	***p<.05***	NS	NS	NS	NS	***P<.01***	***P<.01***	***p<.01***	NS	NS	NS	NS	NS	NS	NS

Table 1 shows higher Anxiety (7.4 vs 5.0; p<,05) Hypochondriasis (85.3 vs 60.7; p<,01) Depression (74.6 vs 51.8; p<,01) and Hysteria (77.4 vs 53.0; p<,01) scores in experimental group compared to control group. Moreover in experimental group the same scales are over the pathological cut-off (65).

Table 2. Repeated Measures ANOVAs PRE / POST treatment -cortical stimulation- on ASQ, CDQ and MMPI-2 scores (Means and Standard deviations are reported) in four of the seven subjects of the chronic pain syndrome group.

		ASQ	***CDQ***	***MMPI-2 SCALES (pathological cut-off: over 65)***											
N: 4 (Repeated Measures)		*STEN*	*STEN*	*L*	*F*	*K*	*HS*	*D*	*HY*	*PD*	*MF*	*PA*	*PT*	*SC*	*MA*	*SI*
PRE-TEST CHRONIC PAIN GROUP	***Mean***	7.0	7.0	45.7	67.2	47.0	85.2	73.0	76.2	54.2	58.0	54.7	58.0	60.2	53.2	57.5
	Standard Deviation	±2,0	±2,2	±8,4	±18,0	±3,9	±8,3	±12,4	±14,4	±16,8	±5,4	±10,4	±9,6	±11,5	±5,7	±8,4
POST-TEST CHRONIC PAIN GROUP	***Mean***	6.7	7.2	48.7	59.5	43.5	81.0	69.0	70.2	54.2	51.5	48.5	61.7	58.7	51.0	59.0
	Standard Deviation	±1,9	±3,1	±11,5	±6,0	±3,7	±5,0	±10,9	±8,0	±16,8	±7,5	±13,8	±13,0	±11,1	±12,1	±9,8
	F (1, 3):	**1.0**	**0.1**	**2.8**	**1.4**	**1.4**	**0.7**	**0.5**	**0.8**	**0.0**	**1.2**	**2.2**	**0.2**	**0.1**	**0.1**	**0.0**
	P value:	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***

Table 2 shows the Pre-Post comparison on four of the seven subjects of the chronic pain group. The treatment produce lowering of Anxiety (7.0 vs 6.7; p:ns) Hypochondriasis (85.2 vs 81.0; p:ns) Depression (73.0 vs 69.0; p:ns) and Hysteria (76.2 vs 70.2; p:ns) scores, however the differences are not significant and the levels remain over the pathological cut-off.

Table 3. Factorial ANOVAs, ASQ, CDQ and MMPI-2 scores in four subjects with chronic pain syndrome during POST treatment -cortical stimulation- vs six subjects with acute pain.

		ASQ	***CDQ***	***MMPI-2 SCALES (pathological cut-off: over 65)***											
		STEN	*STEN*	*L*	*F*	*K*	*HS*	*D*	*HY*	*PD*	*MF*	*PA*	*PT*	*SC*	*MA*	*SI*
POST-TEST CHRONIC PAIN GROUP (N:4)	***Mean***	6.7	7.2	48.7	59.5	43.5	81.0	69.0	70.2	54.2	51.5	48.5	61.7	58.7	51.0	59.0
	Standard Deviation	±1,9	±3,1	±11,5	±6,0	±3,7	±5,0	±10,9	±8,0	±16,8	±7,5	±13,8	±13,0	±11,1	±12,1	±9,8
ACUTE PAIN GROUP (N: 6)	***Mean***	5.0	6.0	53,2	54,2	47,2	60,7	51,8	53,0	45,8	54,2	50,7	49,0	52,0	53,8	53,5
	Standard Deviation	±1.7	±1.7	±8,2	±8,1	±13,3	±11,8	±9,1	±10,4	±13,8	±7,5	±10,2	±7,0	±4,0	±15,0	±7,3
	F (1, 8):	***2.4***	***0.7***	***0.5***	***1.3***	***0.3***	***10.3***	***7.3***	***7.8***	***0.8***	***0.3***	***0.1***	***4.1***	***1.9***	***0.1***	***1.0***
	P value:	***NS***	***NS***	***NS***	***NS***	***NS***	***p<.05***	***p<.05***	***p<.05***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***	***NS***

Finally Table 3 shows that the differences between the chronic pain group and the acute pain group, after the treatment become less significant: Anxiety (from p<,05 to p:ns); Hypochondriasis Depression, Hysteria (from p<,01 to p<,05).

Conclusions

The compare between the subjects with chronic pain and the subjects with acute pain during the clinical assessment phase shows significantly higher anxiety levels in experimental group. Depression, measured by CDQ test, was not significantly different. Our subjects with chronic pain syndrome obtain, to clinical scales of MMPI-2, significantly higher scores for Hypochondriasis, Depression and Hysteria scales showing a frame analogous to others samples with functional pain reported in literature[5-7]. Moreover the observed scores were higher than pathological cut-off for Italian population. Lowering of clinical MMPI-2 and anxiety scales demonstrates that the treatment produces a small but measurable effect. After the treatment the difference between the two groups becoming less significant.

The chronic pain condition seems to be profoundly related to personality tracts of the subjects and to anxiety and depression levels in the pathological range also when a clear psychiatric condition is absent. Notwithstanding the treatment seems produce some changes, the personality pattern of chronic pain patients seems to be relatively stable.

References

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