The biopsychosocial factors that serve as predictors of the outcome of surgical modalities for chronic pain

Kronik ağrıda girişimsel yöntemlerin etkinliğini belirleyen biyopsikososyal faktörler

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Summary

Chronic pain is considered a universal problem in terms of serious impairment in the biopsychosocial functioning of individuals. The psychiatric and psychosocial factors accompanying chronic pain necessitated alterations in classical therapeutic approaches towards chronic pain and resulted in a substantial increase in the number of multidisciplinary pain clinics worldwide. In these pain clinics, the primary goal is not only to predetermine the multiple etiologies playing a role in the acquisition and maintenance of chronic pain, but also to specify whether the individual in pain is psychologically suitable for a surgical intervention for either diagnostic or treatment purposes. This specific question stems from the fact that even though the underlying organic pathologies are similar, the effectiveness of invasive interventions for determining the cause of or attenuating pain may vary between individuals. The most important predictors of adverse outcomes of invasive interventions for chronic pain stated in the literature are primarily depression, anxiety and somatization followed by features of pain such as severity or number of painful body sites. In line with the vast body of research, especially over the previous decade, this small scale review aims to emphasize the interactional roles of biopsychosocial factors on the effectiveness of surgical interventions and to discuss the issues regarding the assessment of these predictors.

Key words: Chronic pain; surgical intervention; biopsychosocial predictors of surgical outcome; presurgical psychological screening.

Özet

Günümüzde kronik ağrı, toplumlarda bireylerin psikososyal durum ve işlevselliklerinin ciddi ölçülerde bozulması açısından evrensel bir problemdir. Klinik gözlemler, başta majör depresyon olmak üzere çeşitli psikiyatrik bozuklukların ve psikososyal değişkenlerin de kronik ağrı sürecinin biçimlenmesinde kayda değer etkilerinin olduğunu göstermektedir. Kronik ağrı yaşantısına eşlik eden psikiyatrik durum ve psikososyal faktörlerin varlığı kronik ağrı tedavisine yönelik klasik tedavi yaklaşımlarının da değişmesini gerekli kılmış ve multidisipliner ağrı kliniklerinin sayısı dünya çapında giderek artmaya başlamıştır. Kronik ağrı yaşantısının çok boyutlu bir yaklaşımla ele alındığı bu kliniklerde temel amaç yalnızca kronik ağrının gelişiminde ve sürmesinde rol oynayan çoklu etyolojilerin belirlenmesi değil, aynı zamanda, daha spesifik olarak, diyagnostik ya da tedavi hedefli girişimsel müdahaleleri gerektiren kronik ağrı durumlarında, ağrıyı yaşantılayan bireyin psikolojik açıdan müdahaleye uygunluğunun da değerlendirilebilmesidir. Çünkü ağrının altında yatan organik patolojiler benzer olsa da, ağrıyı azaltmaya yönelik girişimsel müdahalelerin etkinliği farklı kişilerde farklı düzeylerde olabilmektedir. Literatürde, kronik ağrıya yönelik cerrahi girişimlerin olumsuz sonuçlarını yordayan en önemli değişkenlerin başında depresyon, anksiyete ve somatizasyon düzeylerinin geldiği bildirilmektedir. Bu üçlüyü, ağrının şiddeti veya bedendeki ağrılı bölge sayısı gibi ağrı şikayeti ile ilgili değişkenler izlemektedir. Özellikle son on yılda yoğunluğu artan bu çalışmalar ışığında, bu küçük çaplı derlemede, kronik ağrı sendromlarına yönelik girişimsel müdahalelerin etkinliğini belirleyen biyopsikososyal faktörlerin çoklu rolü tartışılacak ve bu değişkenlerin müdahale öncesi değerlendirilmesine ilişkin yöntemlerle ilgili meseleler üzerinde durulacaktır.

Anahtar sözcükler: Kronik ağrı; cerrahi girişimler; cerrahi girişimlerin biyopsikososyal yordayıcıları; cerrahi girişim öncesi psikolojik tarama.

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Chronic pain is considered as a universal problem in terms of serious deteriorations in psychosocial status and functioning of the individuals. Clinical observations state the accompaniment of various psychiatric disorders, primarily major depression[1-3] with chronic pain. Data indicate that the pointed psychiatric problems may either be a response to or a trigger of pain symptoms.[4,5] Besides psychopathology, there are various psychosocial variables such as education level, coping strategies,[6] personality characteristics,[7] marital or familial conflicts,[8] adverse/traumatic childhood experiences,[9] or occupational/familial secondary gains[10] observed to be playing crucial effects on the process of chronic pain.

The psychiatric and psychosocial factors accompanying chronic pain necessitate alterations in classical therapeutic approaches towards chronic pain. As a consequence, there is a substantial increase in the number of multidisciplinary pain clinics in the few last decades, where algologists, physiatrists, psychologists and psychiatrists work as a team.[11] In these pain clinics, chronic pain is considered as a multidimensional phenomenon, and the primary goal is not only to predetermine the multiple aetiologies playing role in the acquisition and maintenance of chronic pain, but also to specify the most convenient treatment modalities. However, right alongside with this main goal, it is not rare that this team specifically questions whether the individual in pain is psychologically suitable for a surgical intervention for either diagnostic-i.e. in determining the role of facet joint pain in chronic spinal pain-[12] or treatment purposes. This specific question stems from the fact that even though the underlying organic pathologies are similar, the effectiveness of invasive interventions for attenuating pain may vary across individuals.[13] Furthermore, when dealing with low back pain, for example, whereas the success rates of laminectomy or distectomy are reported to be superior in terms of pain severity, medication abuse and level of disability,[14] the outcomes of spinal fusion or procedures specific for failed back surgery are observed to be less effective.[15] At this point, a tremendous increase in the number of studies concerning interactional effects of biopsychosocial factors on the varying success rates of invasive interventions dominates the current literature.

In line with this vast body of research especially during previous decade, at this small scale review, the roles of biopsychosocial factors on the effectiveness of surgical interventions will be discussed and the issues on the assessment of these factors will be outlined.

Biopsychosocial Factors and Invasive Intervention Outcomes

To whom should the invasive interventions for attenuating pain aim at? Who are the most convenient candidates for such an invasive intervention? What are the criteria for convenience?

In today's world, chronic pain is evaluated in a biopsychosocial model and is accepted as a subjective experience. Within this context, it is pronounced that the outcomes of any treatment modality are determined by the characteristics of the individual, his/her social environment and the features of pain.[16] It is also well appreciated that neither psychological indicators, nor physical/biological factors, nor the social determinants are strong enough to predict treatment outcomes by themselves; rather, it is an interactional triangular process.

In a current review by Bruns and Disorbio,[17] the possible biopsychosocial predictors of invasive intervention outcomes are presented in a hierarchical structure. For example, the most powerful predictors are stated to be high levels of depression, anxiety, somatisation, pain severity, the number of painful body sites, job dissatisfaction, level of functioning, absenteeism, low education and passive coping strategies.[6,12] Bruns and Disorbio[17] also report studies which indicate adverse affects of litigation and worker's or insurance compensation on surgical treatment outcomes. Additionally, neuroticism,[7] childhood neglect, abuse or trauma,[9] the reinforcing role of or the perceived neglect/lack of support from the spouse,[18] pre-op perceived health,[19] fear of movement or re-injury and negative treatment outcome expectations,[6] and last but not least, job stress[8] are emphasized as the subsequent predictors of those previously stated above.

To sum up, the primary predictors of the adverse outcomes of invasive interventions seem to be the trio of "depression", "anxiety" and "somatisation",

respectively. Although features related with the pain itself such as its severity and the painful bodily sites are pronounced as one of the most salient factors with respect to the hierarchy, they are observed to have a limited proportion amongst all. Nevertheless, the variables stressed out above are important predictors of surgical operation outcomes, as the most reliable and valid scientific evidence are put forth for these factors.[17]

The Assessment of the Biopsychosocial Predictors

Even though the hierarchical ordering of these predictors seems to be crucial, the researchers working on the development of novel biopsychosocial models towards scanning these pre-op predicting variables propose the necessity of taking into account the interactional effects of these factors. These academicians[1,6,12,16,20] specifically criticise one-dimensional assessment procedures which solely take into account, for instance, the increasing profiles of the "Neurotic Triads" of the Minnesota Multiphasic Personality Inventory (MMPI), a frequently used tool in clinical practice. If such is the case, then what type of scanning procedures can be proposed so as to determine the chronic pain patients' convenience of candidacy for invasive interventions?

One such proposal comes from Carragee[21] who, as a consequence of the studies he conducted on cases with Lumbar disc herniation, infers a hierarchical assessment model where "cost and effect analysis" plays a core function. As the first step of the hierarchy, he suggests no pre-op scanning for spinal disorders where high surgical success rates are the case. Just as Rush, Polatin and Gatchel[1] have mentioned, in these situations with positive treatment outcomes, a surgical intervention can be employed even though there appears a marked pre-op psychopathology. If such is the case, psychiatric treatment can be considered after the invasive intervention. However, this kind of decision inevitably requires a scientific evidence based upon a thorough literature survey and clinical experience. As a consequence, Carragee[21] claims the effectiveness of Distress Assessment Method (DRAM) where depression and somatisation levels are investigated together with a medical evaluation which includes a comprehensive literature survey as to the relations between appropriate treatment outcomes and type of herniation, duration of painful conditions and level of disability. In DRAM, there are two specific questionnaires which compensate for the insufficiency of personality profile scales like MMPI or a standardised tool like Beck Depression Inventory due to their unspecified nature for chronic pain; "The Revised Zung Depression Scale" and "The Revised Somatic Pain Questionnaire".

On the other hand, Epker and Block[20] have studied not particularly on distectomy, but on spinal interventions in general and have proposed a "Presurgical Psychological Screening" (PPS) in selecting patients for spinal surgery. They provide some evidence for the predictive value of PPS. Unlike Carragee's model of DRAM, this pre-op screening procedure does not rule out MMPI's somatisation or neurotic triad profiles. However, it also introduces various tools, techniques and assessment procedures for investigating coping strategies, the reinforcing attitudes and behaviour of the spouse, pre-op history of psychological treatment, litigation for workers' compensation and physical workload. They claim that PPS provides a comprehensive information about pre-op/post-op complications and related psychological treatments in situations where there is urgency for surgery due to the severity of the underlying organic pathology. Although there is valid and reliable evidence that such an information has positive effects on invasive intervention outcomes, Bruns and Disorbio[17] argue that this information is only useful for cases of mild psychopathology, but not for severe psychiatric situations.

Conclusion: What to do?

Based on this small scale review on biopsychosocial factors as predictors of invasive intervention outcomes towards chronic pain, it can be proposed that the most important variables that have adverse affects on treatment outcomes are levels of depression, anxiety and somatisation and therefore should seriously be taken into account in determining whether patients are good candidates for surgery aimed at attenuating pain.

However, especially in situations where there is urgency for surgical operations, the picture of pre-op psychopathology puts the clinicians in a crucial dilemma: should the intervention occur or be de-

layed? Even though Carragee[21] emphasizes the success rates of any surgery for selection to be taken into consideration while making a decision, in literature, the dominating tendency is for the pre-op treatment of psychopathology.[6,1]

Another point that should not be overlooked is that most of the above mentioned biopsychosocial factors are predictors for surgical treatments towards low back pain. The limited number of studies investigating pre-op biopsychosocial factors concerning other types of chronic pain disorders should not be undermined and one should be cautious in generalizing these findings to other types of pain.

On the other hand, when examining the methodological properties, it seems that most of these studies looked for the main effects of these predictors on treatment outcomes. The moderating role of these variables on the relationship between pain complaints and appropriate surgical interventions is still an issue of question. Furthermore, there appear to be critical comments on the psychometric properties of the tools used for measuring these variables.[17]

Another important issue of discussion can proposed for degree of generalization of these results to chronic pain patients in Turkey. There are no specific studies in Turkey which investigate crucial biological-psychological-social characteristics of chronic pain patients that may have relations with adverse surgical outcomes. Measuring these variables is also a problematic matter. Measuring for example depression, anxiety or somatisation with tools specifically developed for chronic pain patients is of crucial importance in testing the predictive values of these variables on success rates of invasive interventions.

Nevertheless, with regard to literature, proposing some modality of criteria for convenience of patients for invasive treatments can serve for a new area of research in Turkey. Therefore, for those chronic pain patients, especially those with chronic low back pain, where surgical intervention is considered as one of the primary options for treatment, prior to coming up with a decision;

1. The presence of psychopathology that may trigger or be the consequence of pain should be scanned with tools specific for this population of patients;

2. The features of pain, especially in terms of severity and number of painful body sites should be considered;

3. The presence of any sign of occupational or familial secondary gain should be questioned;

4. The passive or active strategies in coping with pain should be specified;

5. Personality characteristics and primarily level of neuroticism should be evaluated;

6. Childhood history of neglect, abuse or trauma should be investigated;

7. Health perceptions and behaviours should be examined;

8. Self-efficacy beliefs including those about the anticipated consequences of invasive interventions should seriously be taken into account;

9. And last but not least, a pre-op protocol including all of these variables should be recognized by the multidisciplinary chronic pain treatment team.

In conclusion, it is once again evident that a biopsychosocial and a multidisciplinary approach towards chronic pain is a "*sine qua non*".

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