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Neuropathic Back Pain : Are There Any Practical Diagnostic Criteria?

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Objective : A new point of view on the chronic back pain proposed which is, named neuropathic back pain(NBP). Some proposed a certain pain scale as an useful diagnostic tool. Before scientific verification, some doctors prescribed a new anticonvulsant for the NBP. We investigated diagnostic tools for NBP by a review of the literature.

Methods : A comprehensive computer search of the English literature concerning neuropathic low back pain was performed using the key words such as neuropathic back pain and diagnosis in the PubMed.

Results : In 1998, the term NBP was first used in a patient with lung cancer. In the English literature, there were two diagnostic methods for the NBP, Neuropathic pain scale(NPS) and a pharmacological test. NPS is a pain questionnaire, which depends on the patients' subjective reports on the given questions, such as 'how hot is your pain feel'. By the pharmacological test, NBP was defined as 50% or more decrease of pain on intravenous lidocaine and on local anesthetic epidurally. It also depends on the patients' subjective response to the therapy.

Conclusion : There were still no reliable objective diagnostic criteria for the NBP. It seems to be better to reserve the new anticonvulsants for the NBP till scientific approval.

KEY WORDS : Back pain diagnosis · Pain measurement · Anticonvulsants.

Introduction

Low back pain is typically classified as being 'specific' or 'non-specific'. Non-specific back pain is defined as symptoms without clear specific cause, i.e. back pain of unknown origin. Approximately 90% of all back pain patients will have so called non-specific back pain[42]. Traditionally non-specific back pain is considered as a mechanical back pain, being used as a control group to compare the typical neuropathic pain group[5,6,21].

Recently, some doctors regarded a chronic non-specific back pain as a neuropathic back pain(NBP)[13,15,28]. Clinically, neuropathic pain has general characteristics of the association of unspecified positive and negative sensory symptoms, but there are still no consensus diagnostic criteria of neuropathic pain[12,17,22,29]. We have some questions on the NBP. What back pain is neuropathic? Who introduced the term NBP? Are there any reliable practical diagnostic criteria? If there are no useful clinical tools to differentiate the NBP from the non-NBP, we cannot examine the efficacy of any new therapeutic trials for the NBP. We tried to find out the tools to define the NBP in the literature and evaluate the reliability and validity of the tools.

Materials and Methods

An online computer search using PubMed was performed of all available articles published in English till December 2004. The keywords neuropathic back pain and diagnosis were entered into the query search box of the PubMed website (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed) on May 2005. The limits placed on the search were "English" in the language category, "human" in the study category, and "2004/12/31" in publication date category. There were 45 articles. Abstracts of all "hits" were then printed and carefully reviewed by a single individual for suitability for the study. Articles were considered suitable for full review if the abstract described a diagnostic method or criteria for the NBP.

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Results

When did the term, neuropathic back pain come out?

Gabapentin was developed as an antiepileptic drug. There was the first report of a trial of this new antiepileptic agent for patients with intractable neuropathic pain in 1996[35]. Although someone said that Gabapentin should only be considered for pain management after well-established therapies have failed to produce desired outcomes[44], there were more reports that gabapentin was effective for the neuropathic pain[34,38]. In 1996, there was a report that some back pain might be neuropathic[40]. In 1998, the term, NBP first appeared in the title of an article! Roos DE, a radiation oncologist in Australia first used it in 1998[32]. He said that standard neurological texts did not provide a working definition of neuropathic pain. He refers the neuropathic pain to pain or dysesthesia with a radiating cutaneous component in the distribution of one or more spinal nerves or peripheral nerves, often associated with altered sensation along the same distribution[33]. The effect of Gabapentin on the back pain was reported from 2001[8]. The term, NBP appeared in the scientific articles from 2001[41].

Are there any reliable practical diagnostic criteria?

Although Roos used the term NBP at first, he did not provide diagnostic methods or criteria for the NBP. Only 7 articles[3,4,14,18,20,39,40] described the diagnostic methods or criteria (Table 1). For the diagnosis of the NBP, a pharmacological test was used in two articles. Two kinds of pain questionnaire, neuropathic pain scale(NPS) and Leeds assessment of neuropathic symptoms and signs(LANSS) were used in the others.

A battery of pharmacological tests was composed of three pharmacological approaches; intravenous infusion of morphine, intravenous infusion of lidocaine and a diagnostic epidural opioid blockade. The pain was considered neuropathic, if it decreased by 50% or more in response to both intravenous lidocaine and the epidural local anesthetic.

NPS is composed of a set of questions. This measure includes 2 global (intensity and unpleasantness) and 8 specific ratings that assess both pain location (deep and surface) and pain quality (sharp, hot, dull, cold, sensitive, and itchy). The patients choose how intense, sharp, hot, dull, cold, sensitive, itching, unpleasant, and deep or surface are their pain by themselves. They also choose a time course of their pain. They make a score from 0 to 10 for the 11 items. NPS may be useful to assess the nature or severity of the pain. However, there are no specific diagnostic criteria.

LANSS is composed of five pain questionnaire and two sensory testing. They make a score from 0 to 24. If the score is not less than 12, we can regard the pain likely to be neuropathic.

Table 1. Diagnostic methods in the articles sited in MEDLINE

Author	Year	Diagnostic Methods
Sorensen J, et al	1996	pharmacological test
Sorensen J, et al	1996	pharmacological test
Jensen MP	2004	Neuropathic Pain Scale
Galer BS, et al	2004	Neuropathic Pain Scale
Argoff CE, et al	2004	Neuropathic Pain Scale
Argoff CE	2004	Neuropathic Pain Scale
Hassan AE, et al	2004	LANSS

LANSS=Leeds Assessment of Neuropathic Symptoms and Signs

Discussion

According to the definition of the International Association for the Study of Pain, the neuropathic pain is a pain initiated or caused by a primary lesion or dysfunction in the nervous system. There were numerous possible mechanisms explaining the characteristics of the neuropathic pain, such as abnormal neuronal excitability, ectopic discharge, central sensitization, or immune activation with inflammation[10,23,25,27,36,43,45-47]. Conceptually, the neuropathic pain clearly differs from the non-neuropathic pain. However, it is really hard to diagnose what pain is neuropathic in practice.

There are two kinds of diagnostic tools for the neuropathic pain, a pharmacological test and a few pain questionnaires. In the pharmacological test, the assessor is not the examiner, but the patient. Pain is always subjective[19]. The patients themselves assessed their pain reduction by 50% or not.

Besides NPS and LANSS, there are available diagnostic questionnaires, such as the Neuropathic Pain Questionnaire(NPQ), Neuropathic Pain Symptom Inventory(NPSI), and neuropathic pain diagnostic questionnaire(DN4)[6,7,24]. The NPQ includes 12 items related to the pain. The sensitivity and specificity of the NPQ was reported as 66 and 74%, respectively. NPSI includes 10 descriptors that allow discrimination and quantification of five distinct clinically relevant dimensions of neuropathic pain syndromes. DN4 questionnaire is a series of four questions consisting of both sensory descriptors and signs related to bedside sensory examination. The total score is calculated as the sum of the 10 items and the cut-off value for the diagnosis of neuropathic pain is a total score of 4/10. The sensitivity and specificity of the DN4 was reported as high as 82.9 and 89.9%, respectively. DN4 might be a useful diagnostic tool with relatively high accuracy. However, still the pain assessment depends on the patient, not on the examiner. The diagnosis is up to the patient's response, and the examiner alone cannot make it.

Gabapentin was produced as an anti-epileptic drug. In 1996, there were a few reports that Gabapentin might be effective for the neuropathic pain[35,37]. Although this drug is not an anti-inflammatory analgesic, some doctors already prescribed

Gabapentin as a painkiller. A 2003 Knight Ridder investigation found that off-label prescribing the neurontin was increasing rapidly, with 115 million such prescriptions written in a year, nearly double the number of five years ago. The Knight Ridder analysis found that Neurontin's off-label retail sales were higher than for any other drug studied : About 90% of prescriptions written for Neurontin, or $1.8 billion worth in a year, were for unapproved uses[1]. Neurontin was sold in amount of $ 272 billion in 2004 around the world [Maeil Economy Paper 2005-06-02], 42 billion won in Korea only [The Financial News 2005-05-22]. In 2004, there was a market research report entitled "Neuropathic Low Back Pain-Off-label Revenue Despite Diagnostic Challenge". This report said that neuropathic low back pain offers a significant source of off-label drug sales in the US[26]. In 2004, Pfizer sued again over improper marketing of Neurontin. According to the suit, Neurontin, which received FDA approval in 1993 for the partial treatment of epilepsy, was "aggressively marketed by Warner-Lambert" for bipolar mental disorders, Lou Gehrig's disease, attention deficit disorder, migraines and various pain disorders[30].

Almost all working adults, more than half in any given year, experience low back pain(LBP). Although the differential diagnosis is extensive, most symptoms have biomechanical causes and resolve promptly with little intervention, although recurrence is common[31]. The causes of chronic LBP may be mechanical or non-mechanical, nociceptive or neuropathic. Traditionally, LBP was regarded as a prototype of mechanical pain. Anatomical and pain-provocation studies show that severe and chronic LBP most often originates in the lumbar intervertebral discs, the apophyseal joints, and the sacroiliac joints[2]. However, it is very hard to differentiate the neuropathic LBP from the non-neuropathic LBP clinically. Diagnosis is problematic because available tools lack both specificity and sensitivity. In rare instances, the cause of chronic LBP can be attributed to an identified cause[15]. In primary care practice, 85% of patients cannot be given a definitive diagnosis because of weak associations between symptoms, pathologic changes and imaging, and have resolution of pain within six weeks[11]. Chronic LBP illness may not stem from a mechanical spinal disorder alone. In fact, the mechanical pathology may be just a portion of the problem with amplification by neurophysiologic, social, and psychological issues. Chronic disabling LBP commonly is confounded by chronic pain, emotional troubles, poor job satisfaction, alcohol and narcotic abuse, and compensation issues, just to identify a few[9]. Medicalization occurs whenever a set of social problems is reformulated as a medical problem. This entails labeling as a disease with the presumption of some underlying pathobiology on which therapy can be based[16]. Biomedicine has few solutions for medicalization of the psychosocial problems. Introduction of an inappropriate diagnostic term without practical diagnostic criteria might cause a wrong concept, that the most of the chronic back pain would be the neuropathic pain. The company gives doctors misleading information and kickbacks to promote the drug for uses not FDA approved.

Conclusion

Since there are no reliable objective tests for the diagnosis of NBP, prescription of a new drug should only be considered for pain management after well-established therapies have failed to produce desired outcomes[44].

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