Measurement of Pain in Multiple Sclerosis

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ABSTRACT

life is pain. It is important to determine the features and the measurement of pain. Common types of pain are described in multiple sclerosis. One-dimensional and multi-dimensional pain scales, which are also used in different painful diseases, are used in the measurement of these pain. Scoring and recording in one-dimensional pain scales are easy and a better measurement is achieved in acute pain. However, the disadvantage of these scales is that they do not give detailed information about the

nature of the pain. Multidimensional pain scales are used in chronic and complex pain. Multidimensional scales have some disadvantage about application by patients because of complexity. The development of specific scales for the better measurement of pain in multiple sclerosis is important for the effective treatment of pain in patients.

Keywords: Multiple Sclerosis, pain, pain measurement

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INTRODUCTION

Multiple sclerosis (MS) is a chronic demyelinating disease that continues with many neurological damages and often affects patients' quality of life negatively (1). One of the important factors affecting the quality of life of MS patients is pain (2). The frequency of pain in MS ranges from 29% to 86% (3, 4). It is not yet possible to explain why some patients has pain and others does not have (5). Pain is a subjective experience, and there is no objective, mathematical manual method of measurement. There are many variable factors, such as patients current psychological status, cognitive status, environment, affecting the measurements.

The World Health Organisation (WHO) classification made for the pain is divided into three;

1. Nociceptive (Somatic or visceral) pain: Back pain, painful tonic spasms
2. Neurogenic (central or peripheral) pain: Trigeminal/Glossopharyngeal/ Occipital neuralgia, L'hermitte sign, dysesthetic pain
3. Mixed type (nociceptive and neuropathic component) pains (6).

The classification of pain in multiple sclerosis has been described in a broad metaanalysis in 2008 (7). According to this, the pain in MS is divided into four;

1. Intermittent central neuropathic pain
Trigeminal/Glossopharyngeal/Occipital neuralgia, L'hermitte sign
2. Continuous central neuropathic pain
Disesthetic extremity pain

3. Neuropathic and non-neuropathic pain
Headache
4. Musculoskeletal pain
Painful tonic spasms, back pain, muscle cramps

Trigeminal neuralgia: Episodic or permanent, Severe, sharp, superficial or stabbing pain that lasts for 1 second to 2 minutes and can be bilateral. Conducted studies have found a frequency of 2–5% in MS patients (8). *L'hermitte sign:* It is a pain in the form of an electric shock, which is triggered by neck flexure and spreading from behind the neck to the waist. It's caused by stretching of demyelinated sensory axons at the posterior column (9). *Central Neuropathic Dysesthetic extremity pain* is seen in MS patients, especially in the lower extremities, often bilaterally, with physical activity and a continuous burning sensation at night. *Chronic dysesthesia* is seen in 18.1% of MS patients (10). *Headache:* The prevalence of headache in multiple sclerosis ranges from 17 to 53% (11).

Musculoskeletal pain: It is seen in patients who are using wheelchairs or who have been inactive for a long time or have abnormal walking and posture patterns. The incidence of pain in MS patients was found to be in the range of 12–28%. This type of pain is more common in patients with progressive or progressive relapsing MS types than with Relapsed Remitting MS (12). Painful tonic spasm is a spasm involving 6–11% of MS patients, triggered by movement and hyperventilation, and lasting for less than 2 minutes (12).

Pain Scales

Scales used to measure pain, which is a subjective experience, can also be used to measure pain detected in patients with multiple sclerosis. While the use of one-dimensional scales used for the measurement of pain is more appropriate for acute and definite pain, the use of multidimensional scales are more suitable for more complex and chronic pain (13). On the quantitative scale of one-dimensional scales, the pain is scored on the scale between 0–10. Scale facilitates the definition of pain severity, scoring and recording (14).

The verbal category scale (the one-dimensional scale), is based on the patient choosing the most appropriate word to describe the pain situation (13).

Figure 1. The verbal category scale (13).

Visual analog scale (VAS) (another one-dimensional scale) the patient marks his/her own pain on a 10-cm ruler that is painless at one end and the most severe pain at the other end. Pain is recorded as the centimeter, measured between the beginning and the point that the patient has marked (15). Although the visual scale is quite sensitive than other methods, the scale should be explained to the patient very well, since patients can sometimes randomly mark (16).

Figure 2. The Visual analog scale (VAS) (16).

Faces pain scale (one-dimensional scale) is used to measure pain in patients, such as children, who are more difficult to express themselves (16).

The limitation of use of one-dimensional pain scales stems from the inability to adequately reveal the complex nature of the pain. Some researchers have developed multidimensional scales that reveal different aspects of pain to make up for missing from one-dimensional scales.

Figure 3. The faces pain scale (16).

McGILL PAIN QUESTIONNAIRE

RONALD MELZACK

Patient's Name _____ Date _____ Time _____ am/pm

PRI: S _____ A _____ E _____ M _____ PRI(T) _____ PPI _____

(1-10) (11-15) (16) (17-20) (1-20)

1 FLICKERING QUIVERING PULSING THROBBING BEATING POUNDING	11 TIRING EXHAUSTING	BRIEF MOMENTARY TRANSIENT	RHYTHMIC PERIODIC INTERMITTENT	CONTINUOUS STEADY CONSTANT
2 JUMPING FLASHING SHOOTING	12 SICKENING SUFFOCATING			
3 PRICKING BORING DRILLING STABBING LANCINATING	13 FEARFUL FRIGHTFUL TERRIFYING			
4 SHARP CUTTING LACERATING	14 PUNISHING GRUELING CRUEL VICIOUS KILLING			
5 PINCHING PRESSING GNAWING CRAMPING CRUSHING	15 WRETCHED BLINDING			
6 TUGGING PULLING WRENCHING	16 ANNOYING TROUBLESOME MISERABLE INTENSE UNBEARABLE	<div>COMMENTS:</div>		
7 HOT BURNING SCALDING SEARING	17 SPREADING RADIATING PENETRATING PIERCING			
8 TINGLING ITCHY SMARTING STINGING	18 TIGHT NUMB DRAWING SQUEEZING TEARING			
9 DULL SORE HURTING ACHING HEAVY	19 COOL COLD FREEZING			
10 TENDER TAUT RASPING SPLITTING	20 NAGGING NAUSEATING AGONIZING DREADFUL TORTURING			
		PPI		
		0 NO PAIN 1 MILD 2 DISCOMFORTING 3 DISTRESSING 4 HORRIBLE 5 EXCRUCIATING		

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Figure 4. Melzack McGill Pain Questionnaire (18).

Although multidimensional scales deal with all aspects of pain, the longer application time and the difficulty of understanding the majority of the scale than the one-dimensional scales, limit the use of these scales to assess pain intensity, especially in acute pain or in evaluating treatment efficacy. However, in chronic pain, it may be useful to apply it at certain times to evaluate all aspects of pain (17).

Melzack McGill Pain Questionnaire (One of the Multi-dimensional scale) was created in 1971 by Melzack and Targerson (18), the validity and reliability study was conducted by Kuğuluoğlu et al. for Turkey (19). There are 4 sections in the form. In part 1, the location of pain, part 2, characteristics of pain, part 3, variables that reduce and increase pain, part4, severity of pain (19).

Scandinavian musculoskeletal questionnaire (multidimensional scale), the musculoskeletal pain seen in the last 12 months and the last 7 days and their effects at home/work are questioned. Widely used in epidemiological studies (20).

From multidimensional scales, the Short Pain Inventory is used to determine the severity of the pain and the level of disability it causes (22).

The Memorial Pain Assessment Card is another multi-dimensional scale and it is available for detailed visual analog scale (23).

SF 36-Short form 36 from multidimensional scales is the general quality of life scale, and 1 of 8 subheadings is pain (25).

	Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness) in:	During the last 12 months have you been prevented from carrying out normal activities (e.g. job, housework, hobbies) because of this trouble in:	During the last 12 months have you seen a physician for this condition:	During the last 7 days have you had trouble in:
NECK	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
SHOULDERS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
UPPER BACK	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
ELBOWS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
WRISTS/ HANDS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
LOWER BACK	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
HIPS/ THIGHS	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
KNEES	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes
ANKLES/ FEET	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes	☐ No ☐ Yes

Figure 5. Scandinavian musculoskeletal questionnaire (23).

The Leeds assessment of neuropathic symptoms and signs (LANSS) Pain Scale is used to distinguish pain as neuropathic or nociceptive. It is important to perform 2 sensory tests when evaluating this scale (26).

There are some directions for these 2 sensory tests. Directions for *Allodynia Testing*: Examine the response to lightly stroking cotton wool across the non-painful area and then the painful area. If normal sensations are experienced in the non-painful site, but pain or unpleasant sensations (e.g., tingling, nausea) are experienced in the painful area when stroking, allodynia is present. If the answer is “yes”, it is equal to 5 points. Directions for *Pin-Prick Test*: determine the pin-prick threshold by comparing the response to a 23 gauge (blue) needle mounted inside

<p>4</p> <p>MOOD SCALE</p> <p>Diagram illustrating the Mood Scale, ranging from Worst mood to Best mood.</p>	<p>3</p> <p>RELIEF SCALE</p> <p>Diagram illustrating the Relief Scale, ranging from No relief or pain to Complete relief of pain.</p>
<p>1</p> <p>PAIN SCALE</p> <p>Diagram illustrating the Pain Scale, ranging from Least possible pain to Worst possible pain.</p>	<p>2</p> <p>Diagram illustrating the Anxiety Scale, ranging from Moderate to Just noticeable, Mild, No pain, Excruciating, Severe, and Weak.</p>

Figure 7. The Memorial Pain Assessment Card (27).

a 2 ml syringe barrel placed gently on the skin in a non-painful and then painful areas. If a sharp pin prick is felt in the non-painful area, but a different sensations is experienced in the painful area (e.g., none/blunt only (raised PPT) or a very painful sensation [lowered PPT]), an altered PPT is present. If a pinprick is not felt in either area, mount the syringe onto the needle to increase the weight and repeat. If the answer is “yes”, it is equal to 3 points.

Another test that distinguishes between nociceptive and neuropathic pain is PainDETECT. The most severe and mean pain severity at that moment and over the last 4 weeks, the duration of the pain, the body diagram, the characteristics of the pain are measured (27).

Date: _____ Study ID: _____

Hospital: _____

Brief Pain Inventory (Short Form)

1. Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?

☐ Yes ☐ No

2. On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.

Right

Left

Left

Right

3. Please rate your pain by marking the box beside the number that best describes your pain at its worst in the last 24 hours.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain Pain As Bad As You Can Imagine

4. Please rate your pain by marking the box beside the number that best describes your pain at its least in the last 24 hours.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain Pain As Bad As You Can Imagine

5. Please rate your pain by marking the box beside the number that best describes your pain on the average.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain Pain As Bad As You Can Imagine

6. Please rate your pain by marking the box beside the number that tells how much pain you have right now.

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

No Pain Pain As Bad As You Can Imagine

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[illegible]

Figure 6. Short Pain Inventory (24).

THE LANSS PAIN SCALE

Leeds Assessment of Neuropathic Symptoms and Signs

NAME _____ DATE _____

This pain scale can help to determine whether the nerves that are carrying your pain signals are working normally or not. It is important to find this out in case different treatments are needed to control your pain.

A. PAIN QUESTIONNAIRE

- Think about how your pain has felt over the last week.
- Please say whether any of the descriptions match your pain exactly.

- Does your pain feel like strange, unpleasant sensations in your skin? Words like pricking, tingling, pins and needles might describe these sensations.
 - NO - My pain doesn't really feel like this (0)
 - YES - I get these sensations quite a lot (5)
- Does your pain make the skin in the painful area look different from normal? Words like mottled or looking more red or pink might describe the appearance.
 - NO - My pain doesn't affect the colour of my skin (0)
 - YES - I've noticed that the pain does make my skin look different from normal (5)
- Does your pain make the affected skin abnormally sensitive to touch? Getting unpleasant sensations when lightly stroking the skin, or getting pain when wearing tight clothes might describe the abnormal sensitivity.
 - NO - My pain doesn't make my skin abnormally sensitive in that area (0)
 - YES - My skin seems abnormally sensitive to touch in that area (3)
- Does your pain come on suddenly and in bursts for no apparent reason when you're still. Words like electric shocks, jumping, and bursting describe these sensations.
 - NO - My pain doesn't really feel like this (0)
 - YES - I get these sensations quite a lot (2)
- Does your pain feel as if the skin temperature in the painful area has changed abnormally? Words like hot and burning describe these sensations.
 - NO - I don't really get these sensations (0)
 - YES - I get these sensations quite a lot (1)

B. SENSORY TESTING

Skin sensitivity can be examined by comparing the painful area with a contralateral or adjacent non-painful area for the presence of allodynia and an altered pin-prick threshold (PPT).

- 1) ALLODYNIA (Pain caused by something that normally would not cause pain)**
Examine the response to lightly stroking cotton wool across the non-painful area and then the painful area. If normal sensations are experienced in the non-painful site, but pain or unpleasant sensations (e.g., tingling, nausea) are experienced in the painful area when stroking, allodynia is present.
 - NO, normal sensation in both areas (0)
 - YES, allodynia in painful area only (5)
- 2) ALTERED PIN-PRICK THRESHOLD**
Determine the pin-prick threshold by comparing the response to a 23 gauge (blue) needle mounted inside a 2 ml syringe barrel placed gently on to the skin in a non-painful and then painful areas.

If a sharp pin prick is felt in the non-painful area, but a different sensation is experienced in the painful area (e.g., none/blunt only [raised PPT] or a very painful sensation [lowered PPT]), an altered PPT is present.

If a pinprick is not felt in either area, mount the syringe onto the needle to increase the weight and repeat.
 - NO, equal sensation in both areas (0)
 - YES, altered PPT in painful area (3)

SCORING:

Add values in parentheses for sensory description and examination findings to obtain overall score.

TOTAL SCORE (maximum 24)

If score <12, neuropathic mechanisms are **unlikely** to be contribution to the patient's pain.
If score ≥12, neuropathic mechanisms are **likely** to be contribution to the patient's pain.

Figure 8. LANNS pain scale (21).

PAINDETECT™ PAIN QUESTIONNAIRE

Date: _____ Patient: Last name: _____ First name: _____

How would you assess your pain now, at this moment?
0 1 2 3 4 5 6 7 8 9 10
none max.

How strong was the strongest pain during the past 4 weeks?
0 1 2 3 4 5 6 7 8 9 10
none max.

How strong was the pain during the past 4 weeks on average?
0 1 2 3 4 5 6 7 8 9 10
none max.

Mark the picture that best describes the course of your pain:

☐ Persistent pain with slight fluctuations

☐ Persistent pain with pain attacks

☐ Pain attacks without pain between them

☐ Pain attacks with pain between them

Please mark your main area of pain

Does your pain radiate to other regions of your body? yes ☐ no ☐

If yes, please draw the direction in which the pain radiates.

Do you suffer from a burning sensation (e.g., stinging nettles) in the marked areas?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you have a tingling or prickling sensation in the area of your pain (like crawling ants or electrical tingling)?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Is light touching (clothing, a blanket) in this area painful?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you have sudden pain attacks in the area of your pain, like electric shocks?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Is cold or heat (bath water) in this area occasionally painful?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Do you suffer from a sensation of numbness in the areas that you marked?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

Does slight pressure in this area, e.g., with a finger, trigger pain?
never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

(To be filled out by the physician)

never ☐ hardly noticed ☐ slightly ☐ moderately ☐ strongly ☐ very strongly ☐

x 0 = 0 x 1 = x 2 = x 3 = x 4 = x 5 =

Total score out of 35

R. Freynhagen, R. Baron, U. Gockel, T.R. Tölle, CurrMed Res Opin Vol 22, 2006, 1911-1920 ©Pfizer Pharma GmbH 2006

Figure 9. PainDETECT (22).

CONCLUSION

Pain is associated with decreased health-related quality of life (HRQoL), with impairments in physical and emotional functioning. There are several kinds of pain associated with MS. Some of them are neuropathic pain (continuous or intermittent), musculoskeletal pain, mixed neuropathic and non-neuropathic pain (8).

Although these pains can be measured with one-dimensional and multidimensional scales, establishing disease-specific tests is necessary for effective treatment of pain that significantly reduces quality of life in patients with multiple sclerosis. For this reason, the pain scales should be prepared carefully and the scales should be used with the correct understanding of the patient's practice.

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