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Research Article

Physiotherapy Management Targeting Chronic Pain with Neuropathic Characteristic and Comorbid Insomnia

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Abstract

Background: Most of the patients I managed at the health centre complained of chronic musculoskeletal pain, of these subjects, 41,5% complained of sleep disturbance due to pain

Aim : To share the clinical findings of physiotherapy management of patients with musculoskeletal pain using a contextual approach in order to adjust their sleeping system to get a better Postural alignment, and reduce the sustained pressure of the affected sides while on their preferential sleep position by applying a customized topper.

Method: Case series of 19 side-lying subjects (mean age 55,7 years; range 29-85; 11 females and 8 male) with complaints of nocturnal exacerbation of pain with neuropathic characteristic and comorbid insomnia. They all experienced reduction of their symptoms after applying the customized topper, and reported the reappearance of the same complaints whenever they slept without it.Assessment - a) Patient-Specific Functional Scale Assessment (PSFS) (0- Unable to sleep at all; 10- Sleep as before pain/paraesthesia condition); b) Visual Analog Scale (VAS) for Pain and Paraesthesia (0- No pain/paraesthesia; 10 – Worst pain/paraesthesia)

Results: At the first direct contact (T1), 11 Females and 8 males complained of nocturnal paraesthesia VAS mean – P1-6,1 which prevented them to sleep PSFS – mean T1– 3,7.After assessing the posture on their own sleeping system, a customized topper was prescribed for a better postural alignment and distribution of the body pressure.

At the final direct contact (T3) the VAS mean- P3-0,08 pain/paraesthesia and sleep PSFS – mean- T3-9,53.

Keywords: Neuropathic Pain; Comorbid-Insomnia; Physiotherapy Management; Sleep System; Postural Alignment in Lateral Side Lying

Background

In 2017 I managed 159 patients with chronic musculoskeletal conditions 41,5% complained of comorbid insomnia in besides of other functional limitations such as walking, bathing but will this paper only focus on pain/paraesthesia and comorbid insomnia.

Neuropathic pain is widely recognized as one of the most difficult pain syndromes to manage, and outcomes often are unsatisfactory [1-3].

Scientific data about sleeping position detected that people spend more their sleeping time on side lying than other positions and tend to increase with age and BMI [4-8].

Some health condition also influences the sleeping position such as apnoea [9-11] heart failure or after an infarction without bradycardia [12].

But side lying is also pointed as a risk factor of shoulder pain [13,14].

When sleeping in a lateral position, besides the asymmetrical loaded of the spine, the shoulder, larger trochanter, the knee and the ankle in contact with the sleep system [15]; are under a sustained pressure. Hurtful pressures are produced as the weight of the human body pushes down on its skeletal structure through a small area of soft tissue located between bony prominences and sleeping system such as shoulder and the larger trochanter causing an occlusion of capillary blood flow [16] resulting ischemic-like condition [17].

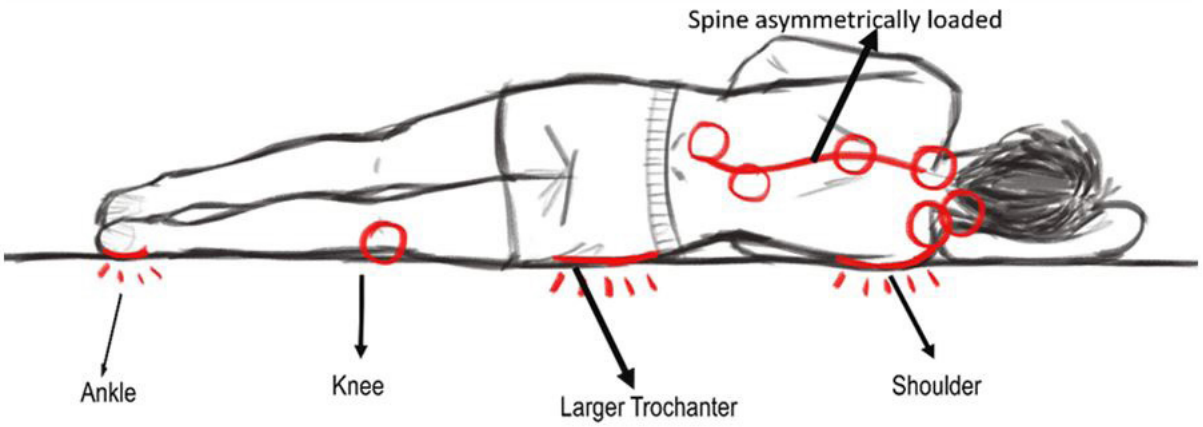

Figure 1: (Image to help the patient to identify their pain sides)

Aims: To describe the clinical findings of physiotherapy management with the application of a customize topper to adjust the sleep system of the subjects to get a better postural alignment and body pressure distribution on their preferential sleep position.

Methods: Case series of 19 side lying subjects (mean age 55,7 years; range 29-85; 11 females and 8 male) with complaints of nocturnal exacerbation of pain with neuropathic characteristic and comorbid insomnia.

Physiotherapy management

Assessment - a) Patient-Specific Functional Scale Assessment; b) Visual Analog Scale (VAS) for Pain and Paraesthesia; c) Postural Assessment in activity and at rest.

Patient empowerment in the management of pain

Home exercise program

Postural adjustment in side lying with the application of customized topper. (After the subjects getting their recumbent posture image on their own sleep system).

All these procedures are applied during 3 direct contacts (T1; T2:T3) completed with electronic contact during 12 months.

The initial assessment (T1) is to determine the functional limitation of Sleeping and other daily activities applying the Patient Specific Functional Scale 0 = unable and 10 = able as before complaints.

The pain with neuropathic characteristic is assessed by the Visual Analog Scale 0 = no pain 10 = worst pain ever.

Postural assessment in the preferential sleep positions on subject's sleep system is via image sent by mail.

Patient empowerment in the management of pain in accordance with the conditions:
Instruction to use cryotherapy or thermotherapy at home.
Addition of support technologies.

Indication for modified tasks gestures to reduce the mechanical stress.

Home exercise program
Active-assisted mobilization exercises
Postural Exercises
Isometric Exercises

Contextual approach: Application of customize topper to adjust their sleep system

To correct the spinal misalignment on side lying and supine position, to reduce pain with neuropathic characteristic and decompress the painful area and restoring the restful sleep.

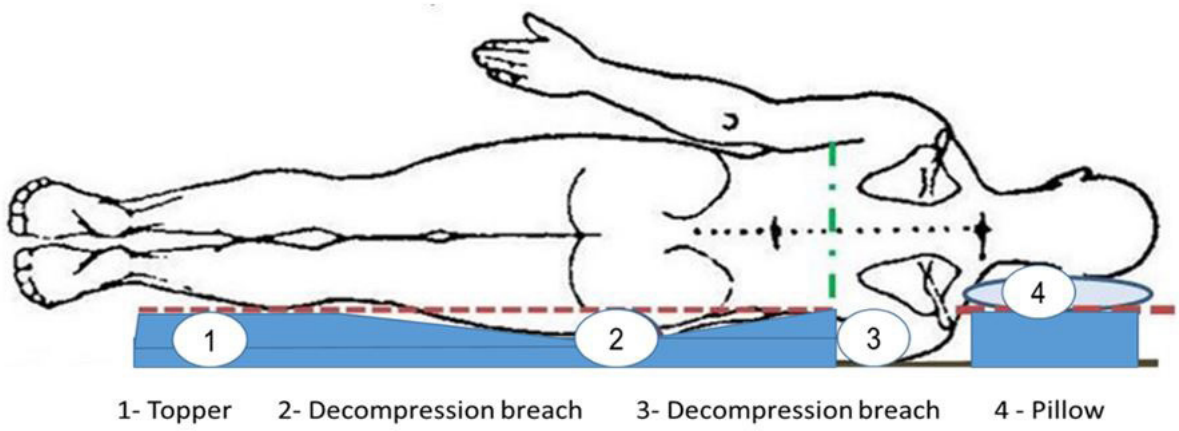

Figure 2: (Customize topper with 2 decompression breach to provide the reduction of the sustain pressure as much as needed)

Figure 3: This image sent by the patient taken at home. (A customize sleep system may optimize the recumbent posture and provide a better weight distribution and better postural alignment)

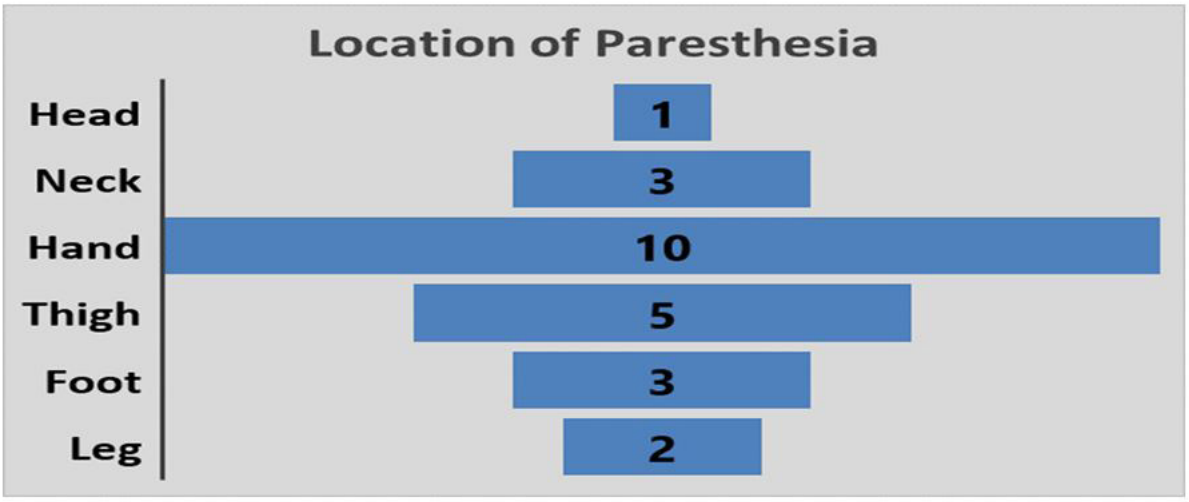

Chart 1: (The pain/paraesthesia of upper part of the body is more prevalence)

Table1: (Patients Information and the outcomes of Physiotherapy management added the contextual approach to get a better sleep environment)

Subject	Age/ Gender	Clinical Information	Sleeping PSFS (Patient Specific Functional Scale 0= Unable; 10 = Able)			Location of Neuropathic Pain VAS (Visual analog Scale) 0= No Pain/Paraesthesia; 10= Worst Pain/Paraesthesia)			
			T1	T2	T3		P1	P2	P3
1	53/F	Low Back, Neck pain	4	8	10	Right Hand	4	1	0
2	66/M	Hand pain, polyarthralgia	5	5	10	Right Hand	5	2	1
3	64/M	Lumbosciatic pain	5	9	10	Right Thigh	2	0	0
4	42/M	Multi-disks herniation	3	8	10	Feet	7	3	0
5	44/F	Back pain	5	6	9	Right Hand	6	4	0
6	52/F	Neck pain with hand numbness	6	8	10	Right Hand	4	0	0
7	33/M	Post-op 2016 L5_S1 no relieve	4	8	10	Left Thigh and Leg	7	2	0
8	50/F	Neck Pain, hand numbness	3	7	10	Right Hand	6	3	0
9	78/F	Post op 2016 no relieve	3	7	9	Hands	6	3	0
10	48/M	L4-5 Herniated disc	4	9		Left Thigh	4	0	
11	76/M	Neck pain; hands numbness	3	10	10	Hands	7	0	0
12	63/M	Post-op C4	3	9	10	Neck	7	1	0
13	29/F	Post op L5-S1	3	8	9	Left Leg	5	2	1
14	48/F	Herniate discD7-8	3	8	9	Neck	8	2	0
15	56/F	Degeneration discs C5-6-7	3	8	10	Neck	8	1	0
16	63/F	Bone spurs L4-5	4	4	9	Feet	4	4	0
17	59/F	Listhesis C3-4; C4-5	4	9	10	Hands	6	2	0
18	73/M	Lumbosciatic pain	5	5	9	Feet	6	3	1
19	61/F	Listhesis C5 Herniate disc L1 –L2; L2-L3; L3-L4	2	8	10	Hands	5	2	0

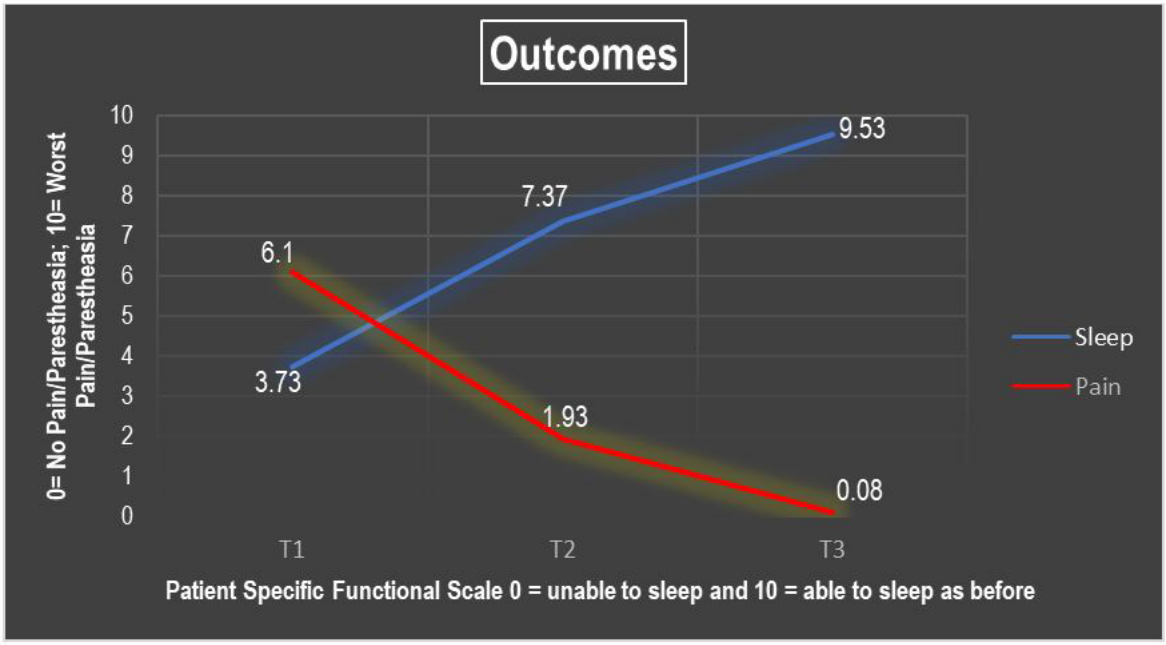

Chart 2: (As the pain/paraesthesia reduce the capacity to stay asleep increase)

Discussion

For the International Classification of Functioning, Disability and Health, sleep is an essential function for physical recovery, memory consolidation, emotional modulation, performance, and learning to be a human being [18].

It's common knowledge that chronic musculoskeletal pain increase with age [19] and that the adoption of side-lying increases with BMI and aging [6]; [20].

Most people spend more than 50% of their time in bed, and older subjects are exposed to a greater risk of suffering lesions [21-24] due to longer sustained mechanical load in the form of pressure on soft tissues, as they spend longer time on their side, and decreased perfusion as one of the aging processes [25,26] causing a lower tolerance to this pressure on the body.

A vast number of studies to prevent pressure soreness confirmed that the sustained loading over a region of the skin perfusion resulted in ischemia [27,28] therefore a better adjusted sleep environment may prevent musculoskeletal conditions [29,30] as per the condition of the subject a customized topper could reduce the loading of the affected side to nil by way of creating space for the shoulder and/or the hip.

Several ergonomics research and projects have already tried to develop individually optimized sleep environments to promote sleep quality. Some concentrate focus on developing a smart sleeping system that actively changes biomechanical properties in order to continuously optimize body support and pressure distribution [31,32] these challenging projects need the cooperation of multiple experts such as sleep physiologists, ergonomists and engineers, and require specific conditions in laboratories with healthy subjects, however, these systems would not be available for the majority of the population.

This paper, though not a scientific trial with rigorous conditions of a laboratory, shows the preliminary outcomes of a physiotherapy management meeting all conditions (health, environmental, economic, social) of each subject.

The customized topper made by the subjects, with my guidance, had reduced their pain symptoms, and all stated the reappearance of the complaints every time they sleep without their customized topper.

Conclusion

Physiotherapy management of chronic musculoskeletal pain should assess the recumbent posture of subjects on their own sleeping system when symptoms increase at night with comorbid insomnia.

These clinical outcomes could only disclose a way for scientific research with a valid measuring equipment such as a pressure map and a larger number of subjects.

Promoting the development of a portable and easily customizable topper would mean a better quality of life to all.

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