

Prevalence of phantom pain among amputees at Lar Escola São Francisco

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ABSTRACT

The physiopathology of phantom limb pain is characterized by cortical map reorganization, a process that involves plasticity in sensorimotor representations. The presence of phantom limb pain can interfere with the physical and psychosocial rehabilitation of amputees, compromising the patient's acquisition of skills and quality of life. **Objective:** To determine the prevalence of phantom limb pain in amputees seen at the Lar Escola São Francisco (LESF). **Methods:** The records of patients attending the Amputation and Prosthesis Group between January 2005 and December 2010 were analyzed regarding the presence or absence of signs of phantom limb pain. **Results:** Phantom limb pain was reported in 10 of 330 records analyzed, corresponding to a proportion of 3.3%. **Conclusion:** Prevalence of phantom limb pain was low among amputees studied at LESF. Its approach needs to be better investigated during individual assessment of amputees.

Keywords: amputees, pain, phantom limb

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INTRODUCTION

The pain sensation can be classified, according to its physiopathology, into neuropathic, nociceptive, and psychogenic. The first type, which will be addressed in the present study, is characterized by a dysfunction in the central or in the peripheral nervous systems, and subdivided into functional, organic, and peripheral.¹

Initially called Post-amputation Syndrome, the sensation of a phantom limb was described in the 16th century by the French military surgeon Ambróise Paré (1510-1590). In the 19th century, from the studies of Silas Weir Mitchell, the term phantom pain started being used.² Didactically, we can divide the post-amputation syndrome into phantom limb sensation and stump (residual limb) sensation, whether painful or not.³

The physiopathology of the painful phantom limb sensation or phantom pain is not totally understood.⁴ There are descriptions in the literature of a motor and sensory process of plasticity, characterized by the reorganization of the mapping of the structures represented in the cerebral cortex with synaptic remodeling of thalamocortical sensory fibers and compensatory adaptation mechanisms in the area representing the amputated region. There is a reduction of the inhibitory action of interneurons in areas of sensory afference, triggering referred sensations.⁵

There is mention of factors associated with phantom pain that can favor its perpetuation and increase its intensity^{6,7} such as the formation of neuromas, the presence of myofascial pain, and injuries in the residual limb as well as in the pre-amputated limb.

In the studied works concerning the painful sensation of a phantom limb, there is a wide interval between the degrees of prevalence, varying from 2 to 90% of the groups contemplated.⁸ Such a discrepancy may be partly justified by the pain treatment already endured for some period before the study; the different causes of the amputation are not distinguished: there are co-morbidities to consider, the current trophic state, as well as the pain in the limb prior to the amputation, and the lack of standardization and criteria for the evaluation and measurement of the pain.⁹

The phantom pain among amputees has a negative repercussion on the rehabilitation process,¹⁰ therefore, the study of its

prevalence may contribute to understanding the magnitude of its effects.

OBJECTIVE

This study seeks to evaluate the phantom pain in the patients assisted at the Lar Escola São Francisco Rehabilitation Center.

METHOD

This was a descriptive, retrospective and transversal study, based on the file research of patients assisted at the Amputations and Prostheses Clinic from January of 2005 to December of 2010. The presence or absence of notes in the medical records about phantom pain complaints was analyzed, whether questioned by the examiner or spontaneously mentioned by the patient. In the period studied, there was no pre-established evaluation protocol, nor any item that would ask specifically about phantom pain, neither qualitatively nor quantitatively.

Patients of both genders were included in this study, with no restrictions as to age, amputated limb, or etiology of the amputation.

The patients in their first clinical consultation came from the community, without any previous triage that would establish any selection.

RESULTS

During the above-mentioned period, 330 patients were served in a first consultation at the Amputations and Prostheses Clinic at the Lar Escola São Francisco Rehabilitation Center. Of those, 244 patients were males and 86, females. Their average age was 57.3 years. Most patients (262) had vascular alteration as their amputation etiology, and for 54 patients, traumatic cause was responsible for their amputation.

Of all the medical records analyzed, ten (10) had references to phantom pain, corresponding to 3.3%. The general data of the amputees and of those with phantom pain are described in Tables 1 and 2.

The pains were described as shocking, or throbbing and sporadic, not constant, and there were no data on their improving or worsening.

There is a statistically significant association between the phantom pain and the characteristics evaluated ($p > 0.05$), and the average age of the patients with and without phantom pain are statistically the same ($p = 0.089$).

DISCUSSION

Classified as one of the Neuropathic Pain Syndromes,¹ phantom pain is the painful sensation in the area amputated. Its physiopathology is not completely understood, but it can be characterized by a peripheral nervous system dysfunction secondary to the amputation and by the neuroplasticity alterations triggered in the central nervous system. There is hyperactivity of the neuronal membranes with the increase of synaptic activities in previously functional regions, and silence in other regions. In addition to functional alterations, there is persistence in the sensory representation of the deafferent region in the central nervous system.¹¹

The characteristics and intensity of the pain are varied. It can be associated with the amputated region, with the presence of local pain, with the duration and intensity previous to the amputation being more frequent in proximal amputations.⁵ It is mentioned in the literature that the pain diminishes with time after the amputation,¹² regardless of the treatment made. It can arise immediately or after varying periods of time post-amputation.

The prevalence of phantom pain mentioned in the literature varies from 2 to 90%, which can be justified by the lack of standardization and criteria in its evaluation.⁴ In the present study, there was a prevalence of 3.3%.

Given this prevalence, it can be considered that many factors interfered with its analysis. First, phantom pain was not mentioned in the medical record taken at the rehabilitation center as a standard item to be evaluated in the period studied, and as a result, this information depended on the remembrance of the physician to question it and/or on the patient to mention it spontaneously. Due to the aspects cited, it is not possible to affirm that this was asked of all the patients evaluated, nor that such information had been considered for all the amputees assisted. Therefore, the absence of positive information does not indicate its non-existence, but only the absence of data, with its presence being under-reported.

In addition to interpretation difficulties on the part of the physician, many times

Table 1. Characteristics of amputees with and without phantom pain (part 1)

Variable	Phantom pain				Total	p
	No		Yes			
	n	%	n	%		
Gender						0.293
Female	82	95.3	4	4.7	86	
Male	238	97.5	6	2.5	244	
COPD						> 0.999
No	319	97.0	10	3.0	329	
Yes	1	100.0	0	0.0	1	
HAS						> 0.999
No	123	96.9	4	3.1	127	
Yes	197	97.0	6	3.0	203	
DM						0.756
No	142	96.6	5	3.4	147	
Yes	178	97.3	5	2.7	183	
Coronariopathy						0.616
No	280	96.6	10	3.4	290	
Yes	40	100.0	0	0.0	40	
IRC						> 0.999
No	306	96.8	10	3.2	316	
Yes	14	100.0	0	0.0	14	
OAA						0.079
No	306	97.5	8	2.5	314	
Yes	14	87.5	2	12.5	16	
OAC						0.338
No	207	97.6	5	2.4	212	
Yes	113	95.8	5	4.2	118	
Dyslipidemia						0.693
No	254	96.6	9	3.4	263	
Yes	66	98.5	1	1.5	67	
ICC						> 0.999
No	306	96.8	10	3.2	316	
Yes	14	100.0	0	0.0	14	
Tobacco smoking						> 0.999
No	242	96.8	8	3.2	250	
Yes	78	97.5	2	2.5	80	
Prosthetization						0.327
No	126	98.4	2	1.6	128	
Yes	194	96.0	8	4.0	202	
Age average (SD)	57.5 (15.9)		48.8 (19.2)		57.3 (16.0)	0.089*
Total	320	97.0	10	3.0	330	

Results from the exact Fisher test; * Results from the Student t-test

the patient's complaint is not mentioned in the consultation due to patient disregarding the presence of pain in a body part that is inexistent.

Another factor to be pointed out is the previous use of pain medications, not

necessarily for phantom pain, which minimize and/or silence the painful sensation¹³ and that many times are not considered.¹⁴ We have not seen reports of medication for this purpose in the medical records of the patients who mentioned phantom pain.

The approach to phantom pain begins with its characterization, definition of frequency, intensity, factors that improve or worsen, treatments already made, and results obtained.

From there, and depending on the intensity and frequency described, the treatment must be initiated with simpler measures, such as massage to reduce tactile sensitivity, wrapping elastic to improve distal circulation, passive kinesiotherapy to preserve the amplitude of joint movement, and activities to strengthen the muscles and improve resistance to fatigue. The psychotherapeutic approach is always indicated.³

The use of tricyclic antidepressants (amitriptyline), anticonvulsive (carbamazepine, gabapentin) medications, and opioids may be indicated, alone or combined, always in dosages that must be increased gradually, depending on the clinical evolution.¹¹

The criteria to evaluate the success of the treatment must involve the use of logs kept by the patients, and scales to evaluate pain and quality of life applied by the health team.³

It is known that the presence of pain in some way impairs the performance of tasks to be done;¹² for example, sleep disturbed by frequently waking up with pain, as mentioned by one of the patients. In our study, despite the reference to phantom pain, eight out of ten patients were prosthetized and wore their prostheses routinely.

Although there was no statistically significant difference, the amputees with phantom pain were younger (48.8 years old) than the amputees without phantom pain (57.5 years old), considering the younger age bracket was inserted in the economically active population group, in which rehabilitation includes the possibility of returning to the job market. It is possible, therefore, to infer that improved knowledge on the evaluation of phantom pain in amputees would bring benefits to their rehabilitation process and gains to their quality of life, as well as to their reacquiring skills that allow them to have an active social and work life. It is still something to be explored more deeply within individual evaluation, to treat it better and to bring more chances of success to the rehabilitation process of amputees.

CONCLUSION

The prevalence of phantom pain was low among the amputees studied at LESF. It needs

Table 2. Characteristics of amputees with and without phantom pain (part 2)

Variable	Phantom pain				Total
	No		Yes		
	n	%	n	%	
Etiology					
Infectious	5	100.0	0	0.0	5
Traumatic	53	98.1	1	1.9	54
Vascular	253	96.6	9	3.4	262
Tumoral	6	100.0	0	0.0	6
Others	3	100.0	0	0.0	3
Level					
Partial of the foot	39	100.0	0	0.0	39
Trans tibial	138	97.2	4	2.8	142
Knee disarticulation	4	80.0	1	20.0	5
Trans femoral	128	96.2	5	3.8	133
Hip disarticulation	3	100.0	0	0.0	3
Trans carpal	1	100.0	0	0.0	1
Wrist disarticulation	3	100.0	0	0.0	3
Trans radial	2	100.0	0	0.0	2
Trans humeral	2	100.0	0	0.0	2
Total	320	97.0	10	3.0	330

to be investigated more within the individual evaluation of the amputee.

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