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Assessment Of Phantom Limb Pain In Diabetic And Non-Diabetic Leg Amputees

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ABSTRACT

Background: Phantom limb pain in the amputated limb is often accompanied by significant suffering. The present study was conducted to evaluate phantom limb pain in diabetic and non-diabetic leg amputees.

Materials & Methods: 52 diabetic patients underwent leg amputation of both genders. Patients were divided into 2 groups. Group I were diabetic patients that underwent leg amputation and group II had non- diabetic (control) patients that underwent leg amputation. Parameters such as prevalence, intensity and characteristics of phantom limb pain was recorded.
Results: Group I had 32 males and 20 females and group II had 28 males and 24 females. Amputation level was transfemoral in 25 and 17, hip disarticulation in 10 and 11, transtibial seen in 7 and 11, partial foot in 4 and 5 and knee disarticulation in 6 and 8 patients. The mean time since amputation was 1.54 years in group I and 1.61 years in group II. The mean experience of phantom limb pain (PLP) was seen in 45 and 41, experience phantom sensations (PS) was seen in 48 and 49, phantom limb pain intensity on VAS was 3.4 and 3.1. Sharp/stabbing pain was seen in 25 and 27, dull ache pain in 14 and 10, shooting/electric pain in 11 and 8, burning pain in 1 and 3 and cramping pain in 1 and 2 in group I and II respectively.

Conclusion: Both groups were comparable in terms of phantom limb pain.

Key words: Diabetes, phantom limb pain, knee disarticulation.

Introduction

Phantom limb pain (PLP)—pain felt in the amputated limb–is often accompanied by significant suffering. The condition is difficult to manage and can lead to disability and reduced health-related quality of life. Several risk factors, including stump pain, diabetic cause of amputation and depression, have been found to be associated with the onset and continuation of PLP. While there are reports of PLP in people with congenital amputations, PLP appears to be more prevalent in people with traumatic or surgical limb amputations.[1]

Amputees with diabetes are thought to experience less PLP. Long standing peripheral neuropathy reduces all sensations perceived from the lower limbs and, as such, patients with diabetes and associated neuropathy are believed to perceive less pain from the phantom limb after an amputation.[2] Few studies have shown that the incidence of PLP is independent of age, gender, and level of amputation, data on what effect the presence of diabetes or peripheral neuropathy may have notably scarce.[3]

Lower limb(s) amputations are performed chiefly to treat complications of diabetes, and may be associated with risk factors for PLP such as pre-amputation pain and depression.[4] The high PLP prevalence could be explained by these risk factors, which are typically absent in people with upper limb amputations, who are typically healthy and undergo amputation due to trauma.[5] The present study was conducted to evaluate phantom limb pain in diabetic and non-diabetic leg amputees.

Materials & Methods

The present study comprised of 52 diabetic patients who underwent leg amputation of both genders. The consent was obtained from all enrolled patients.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups. Group I were diabetic patients underwent leg amputation and group II had non- diabetic (control) patients who underwent leg amputation. Parameters such as prevalence, intensity and characteristics of phantom limb pain were recorded. Data thus obtained was subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Groups	Group I	Group II
Status	Diabetes	Non- diabetes
M:F	32:20	28:24

Table I shows that group I had 32 males and 20 females and group II had 28 males and 24 females.

Table II Demographics characteristics

Parameters	Variables	Group I	Group II	P value
Amputation level	Transfemoral	25	17	0.09
	Hip disarticulation	10	11	
	Transtibial	7	11	
	Partial foot	4	5	
	Knee disarticulation	6	8	
Mean time since amputation (years)		1.54	1.61	0.05

Table II, graph I shows that amputation level was transfemoral in 25 and 17, hip disarticulation in 10 and 11, transtibial seen in 7 and 11, partial foot in 4 and 5 and knee disarticulation in 6 and 8 patients. The mean time since amputation was 1.54 years in group I and 1.61 years in group II. The difference was significant (P< 0.05).

Graph I Demographics characteristics

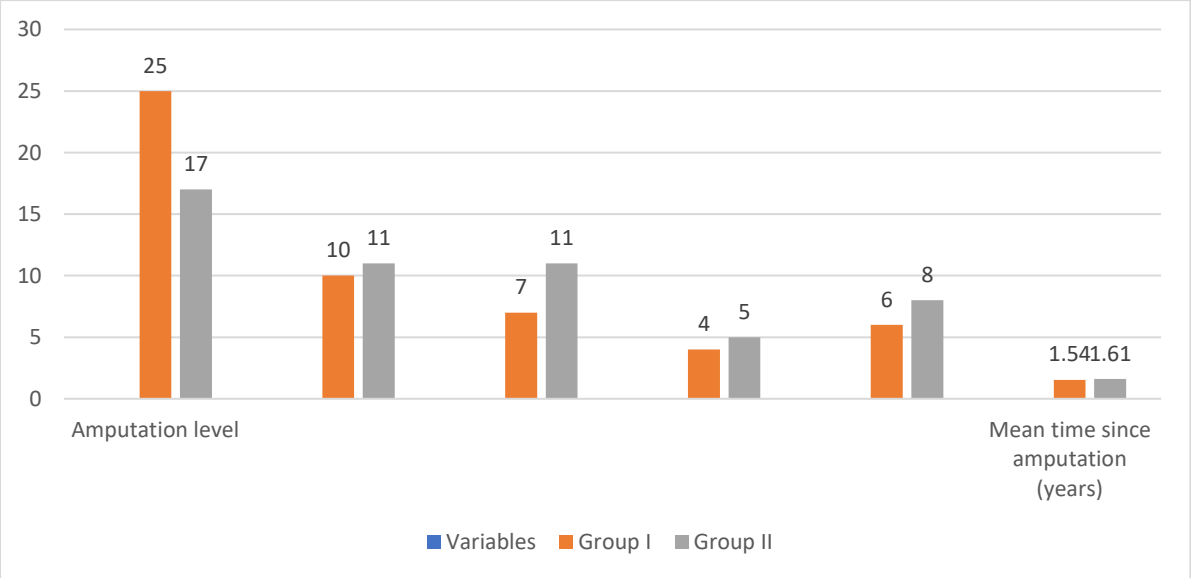


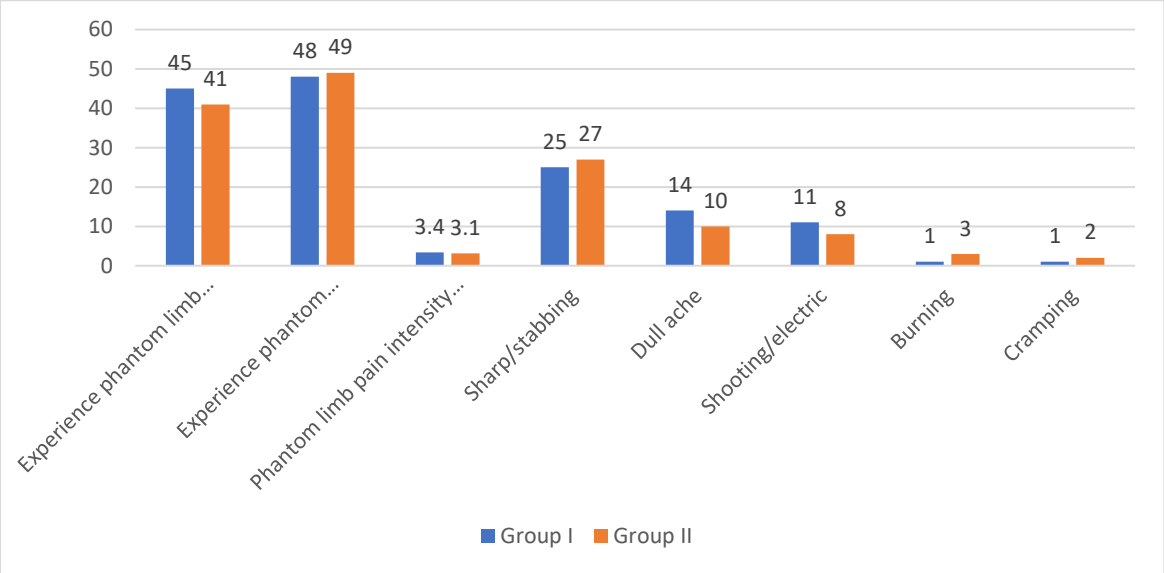
Table III Prevalence, intensity and characteristics of PLP

Variables	Group I	Group II	P value

Experience phantom limb pain (PLP)	45	41	0.92
Experience phantom sensations (PS)	48	49	0.91
Phantom limb pain intensity on VAS	3.4	3.1	0.82
Sharp/stabbing	25	27	0.05
Dull ache	14	10	
Shooting/electric	11	8	
Burning	1	3	
Cramping	1	2	

Table II, graph II shows that mean experience phantom limb pain (PLP) was seen in 45 and 41, experience phantom sensations (PS) was seen in 48 and 49, phantom limb pain intensity on VAS was 3.4 and 3.1. Sharp/stabbing pain was seen in 25 and 27, dull ache pain in 14 and 10, shooting/electric pain in 11 and 8, burning pain in 1 and 3 and cramping pain in 1 and 2 in group I and II respectively.

Graph II Prevalence, intensity and characteristics of PLP



Discussion

Phantom limb pain commonly occurs in people with limb amputations due to trauma or surgery. However, some cases of PLP have been reported in congenital amputees.[6] It has been proposed that risk factors such as persisting pre-operative pain, stump pain and time period since amputation contribute to the onset of PLP. Phantom limb pain remains a serious public health problem because it is common and often undertreated.[7] As a result, persisting PLP may contribute further to depression and problems with prosthesis use, sleep and participation in activities of daily function.[8] PLP can be experienced in many different forms. Literature describes a sharp/stabbing sensation as the most common type of pain, with aches and shooting pain also being highly prevalent. There is, however, no data suggesting how a pre-existing neuropathy might affect the characteristics of pain perceived from a phantom limb.[9] The present study was conducted to evaluate phantom limb pain in diabetic and non-diabetic leg amputees.

We found that group I had 32 males and 20 females and group II had 28 males and 24 females. Clark et al[10] examined the effects of diabetes on the prevalence, characteristics, and intensity of phantom limb pain (PLP) and phantom sensations (PS) in a representative

group of lower-limb amputees. Participants were divided into those who had self-reported diabetes (DM group) and those who did not (ND group). Participants with diabetes were further divided into those with long-duration diabetes (>10 years) and those with short-duration diabetes. Two hundred questionnaires were sent, from which 102 responses were received. The overall prevalence of PLP was 85.6% and there was no significant difference between the DM group (82.0%) and the ND group (89.4%) (P = 0.391). There was also no difference in the prevalence of PS: DM group (66.0%), ND group (70.2%) (P = 0.665). The characteristics of the pain were very similar in both groups, with sharp/stabbing pain being most common. Using a 0–10 visual analogue scale, the average intensity of PLP was 3.89 (±0.40) for the DM group and 4.38 (±0.41) for the ND group, which was not a statistically significant difference (P = 0.402). Length of time since diagnosis of diabetes showed no correlation with average PLP intensity.

We observed that amputation level was transfemoral in 25 and 17, hip disarticulation in 10 and 11, transtibial seen in 7 and 11, partial foot in 4 and 5 and knee disarticulation in 6 and 8 patients. The mean time since amputation was 1.54 years in group I and 1.61 years in group II. Limakatso K et al[11] assessed the prevalence and risk factors associated with PLP in people with limb amputations. The pooling of all studies demonstrated a prevalence estimate of 64% [95% CI: 60.01–68.05] with high heterogeneity. The prevalence of PLP was significantly lower in developing countries compared to developed countries. Persistent pre-operative pain, proximal site of amputation, stump pain, lower limb amputation and phantom sensations were identified as risk factors for PLP.

We observed that mean experience phantom limb pain (PLP) was seen in 45 and 41, experience phantom sensations (PS) was seen in 48 and 49, phantom limb pain intensity on VAS was 3.4 and 3.1. Sharp/stabbing pain was seen in 25 and 27, dull ache pain in 14 and 10, shooting/electric pain in 11 and 8, burning pain in 1 and 3 and cramping pain in 1 and 2 in group I and II respectively. The development of PLP is thought to be highly complex in nature. It has been proposed by Ramachandran and Hirstein that there may be up to 5 contributory factors involved: stump neuromas, cortical reorganisation, corollary discharge, internal body image, and somatic memories. Perhaps it is because of the multifocal pathogenesis of PLP that we found that the presence or absence of a single factor (diabetic peripheral neuropathy) did not have any noticeable effect on patients' perceptions of PLP. It is also possible that some factors (particularly central factors) may play a greater role in the development of PLP than others.[12]

The limitation of the study is the small sample size.

Conclusion

Authors found that both groups were comparable in terms of phantom limb pain.

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