

## Frequency of Phantom Limb Pain in Lower Limb Amputees

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### ABSTRACT

**Objective:** To determine the frequency of phantom pain in lower limb amputees.

**Study Design:** Cross sectional study.

**Place and Duration of the Study:** Armed Forces Institute of Rehabilitation Medicine (AFIRM), Rawalpindi Pakistan, from Jan to Dec 2012.

**Methodology:** Ninety-Six lower limb male amputees fulfilling the inclusion criteria were enrolled. Pain severity was assessed on the visual analogue scale at admission, after one month and the second-month post-amputation.

**Results:** Ninety-Six male patients were studied. The mean age was 27.40±5.00 years. 46 (47.91%) patients had amputation of left lower limbs. Bilateral lower amputation was 8 (8.33%). Mine blast injury was the leading cause of lower limb amputation in these patients (58.33%). In addition, 61 (63.54%) were experiencing Phantom limb pain (PLP). At admission, 31 (50.81%) patients described severe pain on the visual analogue scale; however, this number decreased to 2(3.27%) after two-months post-rehabilitation.

**Conclusion:** Many factors, including phantom limb pain, may delay rehabilitation and community re-integration of amputees. Therefore, it is very important to know the frequency of phantom limb pain; this knowledge will help us manage it in a timely manner.

**Keywords:** Amputation, Phantom limb pain, Phantom limb sensations, Visual analogue scale.

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### INTRODUCTION

Partial or complete loss of a limb is called amputation. It may be acquired during a lifetime or may be present at birth. The cause of acquired amputation may be either trauma or a sequel of non-traumatic conditions. In Canada, the average age-adjusted rate of lower limb amputation (LLA) is 22.9 per 100000 individuals, and the main cause of LLA is diabetes mellitus.<sup>1</sup> In Pakistan, the leading cause of amputation is vascular diseases (63%), followed by trauma 23.31 percent and tumours 13.69 percent.<sup>2</sup>

63% of amputations are caused by road traffic accidents, with the prevalence of lower limb amputation at 81%, and upper limb amputations 19%.<sup>3</sup> 571 patients were studied in different hospitals in Kabul city, and landmines and ordinance explosions were the main causes of amputation (161 amputations out of these 571 patients).<sup>4</sup> Trauma is the main reason of amputation in young people, while in old age its due to vascular cause.<sup>5</sup>

Phantom limb pain (PLP) is commonly seen in individuals suffering from amputation. PLP is narrated

as intense pain felt in the distal parts of an amputated limb. This pain is described as stabbing, burning, or the form of cramping.<sup>6</sup> Estimated prevalence of PLP ranges from 30% to 54%,<sup>7</sup> with two-thirds of these amputees reporting moderate to severe pain.<sup>8</sup> Predicting the exact timing of PLP onset, post-amputation is unknown.<sup>9</sup>

There are limited studies on lower limb amputation and PLP in Pakistan.<sup>10</sup> If we know about the burden of this problem as we deal with it in our set-up, we will be able to know its impact on amputee's rehabilitation, and we will be able to give recommendations that PLP should be diagnosed and managed timely as postoperative rehabilitation of amputees mostly depends on pain relief.

### METHODOLOGY

This cross-sectional study was carried out at the Armed Forces Institute of Rehabilitation Medicine Rawalpindi (AFIRM), Rawalpindi Pakistan from January to December 2012. Ninety-six traumatic lower limb amputees were enrolled in the study.

**Inclusion Criteria:** All the patients above 18 years with amputation due to trauma like road traffic accidents, gunshot wounds, mine blasts, and crush injury were included in the study.

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**Exclusion Criteria:** Patients having pre-existing peripheral polyneuropathy, traumatic amputations with co-existing brain injury, stroke and spinal cord injury, and non-traumatic amputations were excluded from study.

A detailed history of pain, including the type and location, was taken. In addition, a detailed examination of the stump and back was done to rule out other causes of stump pain, which may be confused with phantom limb pain. Finally, on the Visual Analogue Scale, patients were evaluated for phantom limb pain in the first and second months after admission.

Statistical Package for Social Sciences (SPSS) version 17.0 was used for the data analysis. Quantitative variables were summarized as mean  $\pm$  SD and qualitative variables were summarized as frequency and percentages.

## RESULTS

Ninety-six patients fulfilling the inclusion criteria were enrolled in the study. All patients were males who had suffered from traumatic amputations mainly due to war on terrorism and road traffic accidents. The mean age was  $27.40 \pm 5.00$  years. Forty-six (47.92%) patients had amputation of left lower limbs, while 42 (43.75%) had amputation of right lower limbs. Eight patients had bilateral lower limb amputations. Most cases were transtibial (75%), while other amputations were; transfemoral (17.70%), Symes amputation (4.16%) and Choparts amputation (3.12%). Most of the patients suffered from mine blast injuries 56 (58.33%), gunshot wounds 17 (17.71%), road traffic accidents 4 (4.17%) and 2 (2.08%) crush injury cases. In addition, 17.71% cases were victims due to other causes such as Improvised explosive devices (IED), shells and rocket launchers. Many patients 61 (63.54%), reported Phantom limb pain. At admission for rehabilitation after amputation, as high as 31 (50.81%) out of 61 patients were experiencing severe phantom limb pain. 17 (27.90%) patients were experiencing moderate pain, and 13 (21.31%) patients experienced mild pain. Severity of phantom limb pain at first month (post amputation) on visual Analogue scale was shown in Table-I.

**Table-I: Severity of phantom limb pain at first month (post amputation) on visual analogue scale (n=61)**

Severity of Phatom Limb Pain	n (%)
No pain	4 (6.55)
Mild pain	19 (31.14)
Moderate pain	34 (55.73)
Severe pain	4 (6.55)

Severity of phantom limb pain at second month (post amputation) on visual Analogue scale was shown in Table-II.

**Table-II: Severity of Phantom Limb Pain at Second Month (Post Amputation) on Visual Analogue Scale (n=61)**

Severity of Phantom Limb Pain	n (%)
No pain	15 (24.60)
Mild pain	22 (36.06)
Moderate pain	22 (36.06)
Severe pain	2 (3.28)

## DISCUSSION

Previous studies and literature reviews reveal that traumatic amputation is very common in young adults.<sup>11,12</sup> Our study showed that all patients were young ( $27.40 \pm 5.0$  years). Furthermore, studies done in Kabul city from hospital records and surveillance showed that land mines cause most amputations due to war-affected injuries, and the predominant involvement is of lower limbs.<sup>4</sup> This co-relates with the results of our study as 56 (58.33%) out of 96 patients were cases of lower limb amputation secondary to mine blast injuries.

The literature review explains that the prevalence of phantom limb pain in lower limb amputees is 30 to 54%.<sup>7</sup> A study done in another set up revealed that this prevalence is much high (63.54 %).<sup>13</sup>

Studies justify that psychosocial factors have an important co-relation with the pathophysiology of phantom limb pain.<sup>14,15</sup>

We cannot predict the exact time of occurrence of phantom limb pain post-amputation.<sup>9</sup> Several studies showed that 75% of amputees developed phantom limb pain in the first few days.<sup>16,17</sup> In our study, 50.81% of patients experienced phantom limb pain in the early days as patients get transferred to our set-up for rehabilitation very soon after they suffered any amputation.

In different studies, the severity of PLP was graded on a scale of 1-10; this severity decreased significantly after one month, six months and 12 months.<sup>18</sup> If this study is compared with our study, we will come to know that number of patients having severe phantom limb pain (as assessed by VAS) after amputation was 50.81%; this figure gets reduced to 3.27% after two months. In two months, out of 61 patients diagnosed with phantom limb pain, 15 (24.60%) got complete relief from their pain.

We have a state of tertiary art rehabilitation set-up, where phantom limb pain is timely diagnosed and managed with medications and therapeutic modalities. Biofeedback and desensitization techniques being available in our set-up are applied to the patients, so the recovery in phantom limb pain may not be as merely due to the natural course of recovery but rather as a consequence of excellent multidisciplinary rehabilitation teamwork.

### CONCLUSION

Amputation with associated phantom limb pain results in delayed prosthetic fitting and rehabilitation. That is why knowing the exact frequency and burden of PLP in patients suffering from amputation is very important. This knowledge will guide us in timely diagnosis and management of PLP, and chances of undue delay in patient rehabilitation and re-integration may be reduced.

**Conflict of Interest:** None.

### Author's Contribution

MF: Direct contribution, KA: Intellectual contribution. AN; HBK: Substantial contribution.

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