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The Etiology of Upper Extremity Amputation in Lower Punjab Pakistan

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Abstract

Background: Amputation, a common orthopedic procedure, is often necessary due to severe trauma or vascular diseases, yet it can lead to psychological issues. This study investigates the causes of upper limb amputation in a specific region of Pakistan to raise awareness and mitigate risks.
Aims: To identify causes of upper limb amputation in a specific region of Pakistan and raise awareness to prevent such occurrences.
Methods: A cross-sectional study was conducted on upper limb amputations in South Punjab between January 2015 and June 2017. Data from 1174 patients, collected at the Physical Rehabilitation Centre in Muzaffargarh, were analyzed based on age, gender, amputation level, and affected side using HMIS, PMRN, and Microsoft Excel.
Results: Analysis revealed a male-to-female ratio of 824:350, with the highest incidence among individuals aged 31 to 45. Crush injuries, primarily caused by the "TOKKA" machine, accounted for 66.4% of cases, followed by road traffic accidents at 10.7%. Domestic violence and electric shocks were also observed.
Conclusion: Crush injuries from the "TOKKA" machine were the leading cause of upper limb amputations, highlighting the need for machinery safety awareness. Additionally, promoting protective gear use like helmets and early intervention in domestic violence can help reduce such injuries.

Keywords: Upper limb amputation, Road traffic accidents, Crush injuries, Risk mitigation, Community intervention

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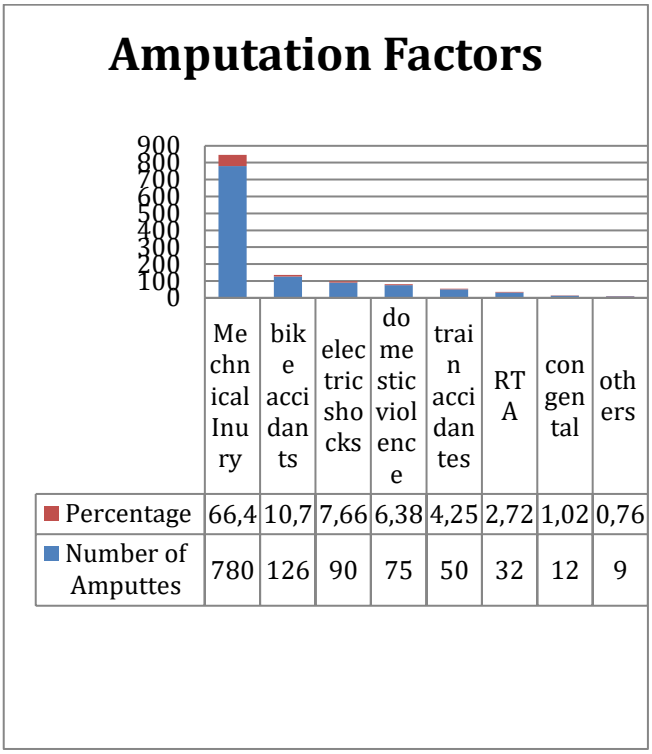
Introduction

Amputation, the surgical removal of an organ from a living body, has been practiced since ancient times and continues to be a crucial procedure in modern medicine, often employed to save lives. This intervention becomes necessary in cases of severe trauma or life-threatening conditions such as vascular disease (Tennent et al., 2014). However, the decision to amputate a limb remains one of the most challenging tasks for surgical teams, particularly when dealing with congenital anomalies where individuals are born with missing limbs (Le & Scott-Wyard, 2015).

Research from (Ilham, 2021) said that beyond the physical implications, amputation can have profound psychological effects on individuals, potentially leading to anxiety disorders and post-traumatic stress disorder (PTSD). In developed countries, peripheral vascular disease (PVD) stands as the primary indication for amputation, followed by diabetes mellitus and road traffic accidents (RTAs). However, the landscape differs in regions like Pakistan, where RTAs and bomb blasts emerge as the leading causes of reported lower limb amputations, as evidenced by research conducted in various parts of the country. Conversely, in European countries, diabetes mellitus is the most reported cause (Goodall et al., 2021).

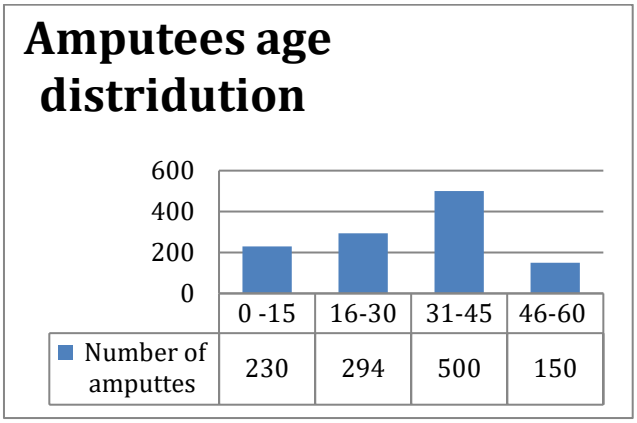
Understanding the diverse factors influencing the prevalence and reasons for amputation across different regions is essential for developing targeted interventions and improving patient outcomes(Miller et al., 2019). This study aims to delve deeper into the specific causes and implications of amputation, particularly focusing on the variations observed between countries like Pakistan and European nations. By shedding light on these differences, we aim to contribute to a better understanding of the multifaceted nature of amputation and inform strategies for prevention, treatment, and rehabilitation on a global scale.

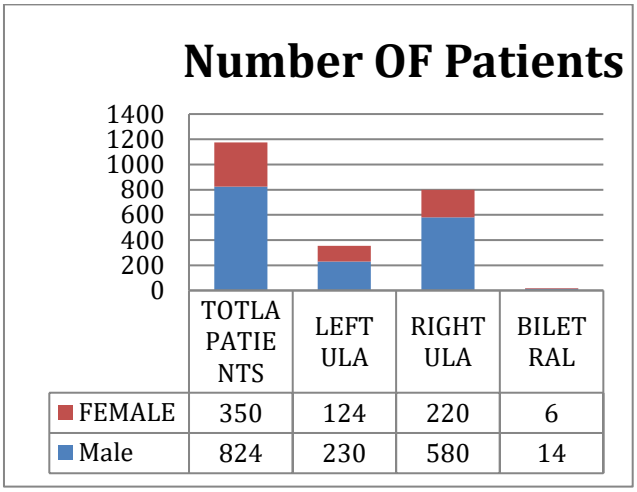


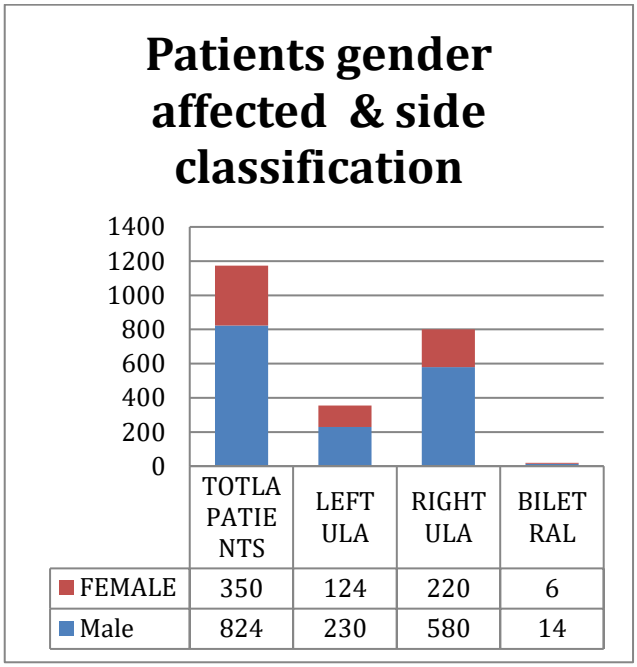
Material and Methods

It is a cross-sectional study of upper limb amputations occurring in various areas of South Punjab between January 2015 and June 2017. A total of 4,374 patients are registered at the Physical Rehabilitation Centre in Muzaffargarh, Punjab, Pakistan, for upper/lower limb amputations and for the provision of supportive and assistive devices.

Out of these, 1,250 patients were selected and interviewed for the study. Among them, 57 were excluded due to a lack of information, leaving a total of 1,174 upper limb amputation patients whose data were collected and analyzed based on age, gender, level of amputation, and affected side. The data analysis procedure was conducted using HMIS (Hospital Management and Information System), PMRN (Patient Medical Record Number), and Microsoft Excel to compute and calculate the data.







Results

The data of 1174 patients were analyzed, comprising 824 males and 350 females, with a ratio of 2.3:1. The age range from 31 to 45 is the peak, as illustrated in Figure 2 (age distribution table), with the majority experiencing right-side affectedness due to increased manual labor. The age group between 16 and 30, representing the maturity stage, also exhibited a significant prevalence of affliction. Crush injuries, primarily caused by the use of a machine known locally as the "TOKKA" machine for cockle reaping, were the most frequent factor leading to upper limb amputations, accounting for 66.4% of the total population. Bike accidents were the second most common cause, comprising 10.7%. Incidents of domestic violence and electric shocks were also observed, as depicted in Figure 1.

Discussion

Amputation, a common procedure in orthopedic practice and rehabilitation technology, presents individuals with various societal, economic, and psychological challenges. Our study sheds light on the susceptibility of males to injuries, often attributed to their familial responsibilities. While previous research has primarily focused on lower limb amputations in Pakistan, with limited attention to upper limb amputations, our findings also underscore a higher incidence of lower limb amputations (Einfeldt et al., 2023).

The male predominance observed in our study aligns with findings from other published series; however, the male-to-female ratio of 2.1:1 is notably lower compared to previous studies in Pakistan. These studies reported male-to-female ratios of 6.7:1 and 6.6:1, respectively, attributing the higher ratio to trauma as the primary cause of amputation compared to diabetic gangrene and peripheral vascular disease (PVD). The lower male-to-female ratio in our survey can be attributed to the predominant indication being diabetic foot gangrene (Di Giovanni et al., 2021).

Interestingly, our study also reveals a peak incidence age in the sixth decade, consistent with recent reports from South-West

Nigeria, South-South Nigeria, and North-Western Tanzania. This suggests a similar trend in the age distribution of individuals undergoing amputation across different regions, which may reflect common underlying factors such as aging populations and the prevalence of conditions like diabetes contributing to the need for limb amputations (Ahmad et al., 2014).

Moreover, while our study focuses on the elderly population, it's crucial to recognize the broader implications of amputation across various age groups and demographics (Ziegler-Graham et al., 2008). Addressing the multifaceted challenges associated with amputation requires comprehensive strategies that encompass not only medical interventions but also social support, rehabilitation services, and psychological counseling (Calabrese et al., 2023). By understanding the demographic patterns and underlying causes of amputation, healthcare providers can tailor interventions to meet the diverse needs of affected individuals and improve their overall quality of life.

Conclusion

In conclusion, our study highlights crush injuries with TOKKA (animal food cutting machine or cockle baiter) machines as the primary leading cause of upper limb amputations (ULA), followed closely by road traffic accidents. These findings underscore the pressing need to raise awareness regarding the importance of proper machinery covers to mitigate the risk of amputations in our environment. Implementing safety measures such as wearing helmets while riding bikes can significantly reduce the occurrence of bike accidents and subsequent amputations.

Furthermore, early intervention by neighbors in cases of domestic violence is crucial for mitigating injuries that may lead to amputations. By fostering a culture of vigilance and prompt action, communities can play a vital role in preventing the devastating consequences of traumatic injuries.

In summary, our study not only provides insights into the epidemiology of upper limb amputations but also emphasizes the importance of preventive measures and community engagement in reducing the burden of amputation-related injuries. By addressing the underlying causes and implementing targeted interventions, we can work towards creating safer environments and better protecting individuals from the life-altering effects of limb loss.

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