

Original Article

CAUSES OF AMPUTATION IN PAKISTANI POPULATION

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Abstract

Background: the causes of amputation are trauma, infection and malignancies. In developing countries, the leading cause of amputation is trauma. Globally, the rate of amputation has been on rise due to accidents, gun- shot injuries, vascular diseases, diabetes, terrorist attack, bomb blasts and earthquake.

Objective: the objective of the study was to find out the most frequent cause of amputation in Pakistani Population.

Study design: Cross sectional survey.

Setting: The registered patient's record was collected from the PIPOS (Pakistan Institute of Prosthetic and Orthotic Science) Rehabilitation Services Program (PRSP), Peshawar from the January 1st 2010 to December 31st, 2012.

Subjects/patients: Study population for this study was fresh amputee/ newly registered patients. Sample size was 3268. The Data were analyzed using SPSS 17.0.

Results: Total number of participants was n=3268 and their mean age was 28.5±5.0 years. After analyzing the data, it showed common causes which were trauma 75% (n=2450), disease 17.4%(n=251) and congenital 7.7 % (n=567). In cause of trauma, the data were assorted into components which were bomb blast 37.2%, (n=915) road traffic accident 20%(n=488) and others 43% (n=1865) respectively.

Conclusion: The common cause of amputation was the trauma. In cause of trauma, the most frequent component was the Bomb blast.

Keywords: Amputation, Road traffic accident, Bomb blast, orthoses & prostheses

Introduction

The purging of whole limb causes disability/amputation or part from any of its parts as it is dysfunctional. The amputation is without delay associated with venous and vascular accidents.⁽¹⁾ Early in the sixteenth century, Ambroise Pare´ was the first to apply ligatures to govern bleeding after amputation and designed distinctly sophisticated prosthesis.⁽²⁾

It is one of the most ancient of all surgical treatments; history of its antique as that of the human race. Over a billion of individuals or 15% of population of the world expected to live with some form of disability in the current time.⁽³⁾ According to World Bank, 3.08 % - 16.21% of population is living with disability in developing countries around the globe. In Pakistan, disability ratio is 5.99%.⁽⁴⁾ World over, the amputation rate has been increasing due to accidents, gun- shot injuries, vascular diseases, diabetes, terrorist attack, bomb blasts and earthquakes.⁽⁵⁾ While estimation of trauma is 45 % in the young age yearly, the majority of amputations in the USA are ascribed to Peripheral vascular disease with an estimated to 64% in older age.⁽⁶⁾ An approximate 49.4% non-traumatic lower extremity amputations were executed in England over a five-year period from 2004 to 2008. Moreover, the authors stated that peripheral vascular diseases cause

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78.5% of amputation.⁽⁷⁾ Thus, it can be concluded that, in developing countries, peripheral vascular disease is the most common cause of amputation.

A study conducted in India suggests that trauma had caused 70.3% of amputation.⁽⁸⁾ While a study from Korea suggests 60% of amputation.⁽²⁾ A study on Pakistani population stated that, in spite of safety rules which are not usually followed in this country, trauma (road traffic accident) is the most common cause of amputation.⁽⁵⁾ Similarly, a cross sectional study of Pakistan also stated that the number of non-diabetic cases of amputation 858(78.6%) was greater than the diabetic 233(21.4%) cases. The authors presented statistics on trends in diabetes-related and non-diabetes in a metropolitan city Karachi and rural Sindh in January 2007 and December 2010. Our country Pakistan is a low resource developing country which has high prevalence of amputation. Therefore, other than peripheral diseases, causes like trauma are more dominant.⁽⁹⁾ In the developing countries like Pakistan, the studies suggest that, the most common cause of amputation is trauma.

A study of Chile (South America) stated that crushing injury and road traffic accident were consistent components among the traumatic causes leading to amputation to the lower limb.⁽¹⁰⁾ Road traffic accidents according to the study of University of Maryland, USA are the common cause of amputation.⁽¹¹⁾ Similarly, road traffic accidents in India were most frequent components of traumatic cause.⁽⁸⁾ A study of Pakistan (Karachi), Patients followed by trauma in (45.3%) patients but further investigation in traumatic causes was absent.⁽¹²⁾ Therefore, it has been found that there is no any study held to know frequent/major cause among the causes of trauma from last few years in province of Khyber Pukhuthkawa, Pakistan. Studies were being held to find out the common causes of amputation yet in the country.

Methodology

This study was Cross sectional survey. The study used quantitative methods to figure out the results. Registered record of patients coming from throughout the Pakistan was collected from the PRSP. The time period for collection of data was from January 1st, 2010 to December 31st, 2012. All trustworthy concerns were followed while collecting the data. The inclusion criteria from the overall population were amputees. The exclusions criteria from included population were old amputees. So, study of population for this study was fresh amputee/newly registered patients. Sample size was 3268. The data were studied using SPSS 17.0/MS Excel 2013.

Results

Total number of applicants was 3268 comprising of male 83% (n= 2715) and female 17% (n= 553). The mean age of applicants was 28.5±5.0 years. After analyzing the data, it indicated that general causes were trauma 75% (n=2450), disease 17.4%(n=251) and congenital 7.7 %(n=567). Subsequently, the results revealed the major cause, which was trauma. Therefore, the trauma was further classified into constituents: Road Traffic Accident 20%(n=488), Bomb blast 37.2%(n=915), Gunshot 22.6% (n=553), Electric current, 6.1%(n=150,), Shelling 2.7%(n=64) Work related accident 2.6%(n=65), mine Accident

1.4%(n=35), Diabetes trauma 2.8%(n=67), Burn 1.6%(n=40) and sentence/Physical bits/fall injury 3%(n=73). Study also perceived that there were below knee amputation 50.1%(n=1638), above knee amputation 22.4 %(n=734), and amputation of either levels of lower or upper limb 27.4%(n=896). (Table 1)

Table 1: Characteristics of Amputee Population (n=3268)

	Mean/N	SD/%
Age	28.5	5.0
Gender		
Male	2715	83%
Female	553	17%
General Causes		
Congenital	251	7.7%
Diseases/infection	567	17.4%
Trauma	2450	75%
Major causes in Trauma (n=2,450)		
Road Traffic Accident	488	20%
Bomb Blast	915	37.2%
Diabetes trauma	67	2.8%
Gun Shot	553	22.6%
Shelling	64	2.7%
Electric Current	150	6.1%
Work Related Accident	65	2.6%
Mine Blast	35	1.42%
Burn	40	1.63%
Punishment/Animal Bite	73	3%
Level of amputation		
Below Knee	1638	50.1%
Above Knee	734	22.4%
others level	896	27.4%

Discussion

17.4 % amputation is due to disease authors have specified that 75% amputation is due to Trauma. Korean study result was similar to this study because 60% amputation is by trauma and second most cause.⁽²⁾ The similarity of results was that, the mean age and gender ratio of amputees of current study were also similar to the Korean study. In addition to this, the prior study was also from same demographic where it already presented that major cause in developing countries was trauma. Similarly, the study of India also revealed the similar results as current study did so. Moreover, seventy percent of amputation was due to trauma and the fevers were amputated due to peripheral diseases.⁽⁸⁾ Additionally, The Study was held in Karachi (Pakistan) to know

the major causes of amputation which was the trauma i.e eighty percent by trauma, therefore the results were related to this study on characteristic of gender and mean age as well.⁽⁵⁾ Hence, the above results of study of India and Karachi (Pakistan) revealed that major cause of amputation was the trauma. In these countries, reason for trauma takes place due to violation of traffic rules and ignorance of the security measures in daily life.

The writers of this study classified the traumatic cause into further categories, which were road traffic accident, bomb blast, gunshot and others. The cause of trauma, the most frequent component was bomb blast to cause amputation that was in contrast to the results of Korean study because the common component in trauma was road traffic accident. Incidence of road traffic accidents was much similar to this study because of violation of traffic rules in both countries. Another reason was that the sample size of present study was less than that of Korean study.⁽²⁾ Also, the study of India, there was greater concordance of road traffic accident in all varieties of trauma because people are having same type of routine. On the other hand, current study showed that there was higher concordance of bomb blast to cause amputation.⁽⁸⁾ The results of study of Mexico indicated that among the components of trauma, crushing injury was conquered more than the road traffic accident because country was a developed country as compared to Pakistan and India.⁽¹⁰⁾ The study of University of Maryland, stated common cause of amputation was road traffic Accident. So, the results were not similar to this study.⁽¹¹⁾ The previous studies of said countries revealed that road traffic accident was the most common component in trauma. However, no study revealed that bomb blast was frequent cause because the incidence of bomb blast was very low as compared to Pakistan. This study was carried out soon after and during the war on terror.

Another study of Pakistan (Karachi) revealed that road traffic accident was 38.38 % and bomb blast was 1.34 % and its outcomes were also different to that of this study. Current study revealed that bomb blast had great concordance than road traffic accident. Reasons for difference of findings were that, first, current study is very recent and secondly, present study has large sample size as compared to

prior one.⁽⁵⁾ Another study of Pakistan revealed that maximum amputation was due to Firearm injuries, and then a few cases were due to road traffic accidents injuries.⁽¹³⁾ Study of Lahore (Pakistan) revealed that firearm injury had high concordance.⁽¹⁴⁾ Reason of difference in result to this study was: firstly, studies of Islamabad and Lahore were not held on amputation, secondly, these data were of surgical unit, and thirdly, previous studies were very old and were held before 2009 when the incidence of bomb blast were very low. Thus, this study supposed that bomb blast had continued common component of trauma for amputation in country.

Existing Study also observed that below knees amputation was fifty percent and above knee amputation was twenty-two percent. Also, the Korean study also revealed the similar outcomes as associated to that of current study.⁽²⁾ Moreover, the study of India also confirmed that Below-knee amputations had great concordance.⁽⁸⁾ Reason of similarly findings was having same cause as the trauma and it mostly affects lower extremities. On other hand, study with sample size of 5,180 revealed greater concordance of transmetatarsal amputation than transtibial amputation. Consequences were contradictory to current study because survival chance is more prevail in transmetatarsal amputation than below knees amputation; so, the study was held for survival of amputees after amputation. Also, the cause of amputation was non-traumatic/disease. Another reason was that renal disease and cardiovascular disease are independent risk factors proximal amputation level, thus transmetatarsal is a distal amputation though, and trauma randomly affects lower part of limb.⁽¹⁵⁾ This study revealed that lower limb amputees were more than upper limb amputees as similar to the result of Korean study because of having same type of cause.⁽²⁾

Conclusion

The study determined by presenting results of data collected from PRSP that evaluated the recurrent cause, was the trauma in common causes of amputation. In cause of trauma, the most repeated component was the bomb blast and mentioned causes transform a person to an amputee of either lower or upper limb particularly the below knee amputee.

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Author's Contribution:

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