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Research Article

Prevalence of Major Amputation in COVID-19 Era Compared to Non-COVID-19 Era- A Descriptive Retrospective Single Centre Study

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Abstarct

Introduction

Amputation is the loss or removal of a body part such as a finger, toe, hand, foot, arm or leg. It can be a life changing experience affecting your ability to move, work, interact with others and maintain your independence. Continuing pain, phantom limb phenomena and emotional trauma can complicate recovery.

Objective

To assess the Prevalence of major amputation in covid-19 era compared to non-covid-19 era.

Materials and Methods

A descriptive Retrospective single Centre study was contacted in the Department Of Vascular Surgery, Ibrahim Cardiac Hospital And Research Institute, Shahbag, Dhaka, Bangladesh from Pre-pandemic era- 1st March 2018 to 3th August 2019: 18 months Group A and Pre-pandemic era- 1st March 2020 to 31th August 2021: 18 months Group B. We used the admission registers of all the hospital's departments. We carried out a data collection sheet which allowed us to study the following parameters: the demographic aspects (age: according to WHO age groups and the sex of the patients), the type of amputation, the level of amputation and the causes.

Results

In the prepandemic phase, 18 major amputations were done (BK, 10 and AK, 8, and in the pandemic phase, 68 major amputations (BK, 53 and AK, 15) (P =.527) were undergone (fig-1). The age of the study participants in the prepandemic and pandemic period who had undergone a major amputation was 60.2 ± 13.4 and 62.88 ± 11.08 years (p=.241), respectively. The majority of the study participants were male in both the periods (prepandemic, M: F = 12:6; pandemic, M: F = 50:18) (P = .705). The mean duration of ulcer in the prepandemic period was 9 days and the same during the pandemic period was 10.8 days (P = .269). Co morbidities DM was present in 12(66.66%) study participants in the prepandemic and 40(58.82%) participants in the pandemic period (p=1.000). Diabetes Mellitus (DM) was present in 16 (88.88%) study participants in the prepandemic and 42(61.76%) participants in the pandemic period (p= 1.000). PAD was present in 16 (88.88%) and 38 (55.85%) study participants in the prepandemic and pandemic groups, respectively (p= .248). The amputation rate in the prepandemic and pandemic phases was 4.48 per 1000 and 10.30 per 1000, respectively (Table-1). The above chart shows distribution of complications after amputation. Presence of Ulcer was present in 16 study participants in the prepandemic and 34 participants in the pandemic period (p=0.006*). Acute Limb Ischemia was present in 1 study participants in the prepandemic and 10 participants in the pandemic period (p=1.000).

Conclusion

Number of major amputations increased a lot in COVID-19 era compared to non COVID-19 era due to lack of regular follow-up for this panic COVID situation. The prevalence of diabetes-related major amputations during the COVID-19 pandemic. From the results of this study, we observed there was a delay in seeking health care during the pandemic period when compared to the prepandemic period. Furthermore, these emphasize the need for easy and routine access to foot-care specialists to prevent avoidable amputations.

Keywords: Amputation, Gangrene, Lower Limb Amputation, Peripheral Arterial Occlusive Disease, Diabetes Mellitus

1. Introduction

Amputation is the loss or removal of a body part such as a finger, toe, hand, foot, arm or leg. It can be a life changing experience affecting your ability to move, work, interact with others and maintain your independence. Continuing pain, phantom limb phenomena and emotional trauma can complicate recovery. Above-the-knee amputations are performed

in patients of all ages for a variety of reasons. The amputation is performed through the femur and allows patients to use prosthesis for ambulation. This activity reviews the indications and techniques for above-the-knee amputations and highlights the role of the inter professional team in caring for patients who undergo this procedure [1]. A person can experience a traumatic amputation from a motor vehicle, occupational or industrial accident or combat injury. Traumatic injury accounts for about 45% of all amputations. A body part can be cut off or torn away in a severe accident, or it can be so badly damaged from a crush injury or severe burns that it cannot be saved. Above-the-knee amputations (AKA) involve removing the leg from the body by cutting through both the thigh tissue and femoral bone.

This procedure may be necessary for a wide variety of reasons, such as trauma, infection, tumor, and vascular compromise. There are several known physiologic and psychologic complications that are associated with this procedure. However, an inter professional approach to caring for these patients may decrease the rate of these complications. A below the knee amputation (BKA) is a transtibial amputation that involves removing the foot, ankle joint, distal tibia, fibula, and corresponding soft tissue structures. In general, below the knee amputations are associated with better functional outcomes than above the knee amputations. This activity describes the indications and technique for performing below the knee amputations and highlights the role of the inter professional team in the pre and post-operative management of patients undergoing this procedure [2]. A below-knee amputation ("BKA") is a transtibial amputation that involves removing the foot, ankle joint, and distal tibia and fibula with related soft tissue structures. In general, a BKA is preferred over an above-knee amputation (AKA), as the former has better rehabilitation and functional outcomes.[3] The rates of lower extremity amputation have declined in recent years, but 3500 trauma-related amputations are still performed in the United States each year.[4] This surgical operation carries significant morbidity, yet it remains a treatment modality with vital clinical and often life-saving significance given appropriate indications [5, 6]. If tissue destruction, infection or disease affects a body part in a way that makes it impossible to repair or endangers the person's life, that part may be removed by surgical amputation. Amputation of the extremity is one of the oldest surgical interventions that date back to the time of Hippocrates [7].

Amputation is not a failure of treatment rather it constitutes part of treatment when limb is not salvageable. It is indicated when the limb is not salvageable, it is dying or dead, it poses a threat to patients life, or it is viable but functionless [7, 8]. Lower limbs have loco motor function and functionless lower limb will interfere with employment of the patient. Dismemberment of the lower extremity has considerable economical, social and psychological impact on the patient and his family, but at the same time is a rehabilitative measure to improve patients' quality of life [8, 9]. Lower limb amputation (LLA) can be major or minor. Major LLA is the one, which is performed at the level of the ankle or above [10]. The most common indication for LLA varies in different parts of the globe, however, trauma and peripheral vascular disease (PVD) including diabetic foot constitutes the major burden [11, 12].

2. Materials and Methods

A descriptive Retrospective single Centre study was contacted in the Department Of Vascular Surgery, Ibrahim Cardiac Hospital And Research Institute, Shahbag, Dhaka, Bangladesh from Pre-pandemic era- 1st March 2018 to 3th August 2019: 18 months Group A and Pre-pandemic era- 1st March 2020 to 31th August 2021: 18 months Group B. We used the admission registers of all the hospital's departments. We also consulted the registers of the operating theatre and the staff of the Orthopaedic-Traumatology department (the only department that performs amputations). Thus, we were able to include all patients who had a major amputation (amputation site above the foot or hand) regardless of age or sex. We then consulted the patients' files. We carried out a data collection sheet which allowed us to study the following parameters: the demographic aspects (age: according to WHO age groups and the sex of the patients), the type of amputation, the level of amputation and the causes.

2.1 Statistical Analysis

Collected data were entered in Microsoft Excel and the variables were coded. It was exported to IBM SPSS. Descriptive analysis was used to represent the data. Mean and standard deviation were used to represent the hospital stay, age of the study participants, duration of diabetes of the study participants, duration of ulcer, blood pressure (systolic and diastolic), estimated glomerular filtration rate (eGFR), glycosylated hemoglobin, and hemoglobin levels at the time of admission. Frequencies and percentages were used to represent the other parameters including number of BK amputations, AK amputations, gender, presence of complications, and history of previous surgeries. Wilcoxon signed-rank test was used as the data was non normal. IBM SPSS Version 20 was used.

3. Results

In the prepandemic phase, 18 major amputations were done (BK, 10 and AK, 8, and in the pandemic phase, 68 major amputations (BK, 53 and AK, 15) (P = .527) were undergone (fig-1). The age of the study participants in the prepandemic and pandemic period who had undergone a major amputation was 60.2 ± 13.4 and 62.88 ± 11.08 years (p=.241), respectively. The majority of the study participants were male in both the periods (prepandemic, M: F = 12:6; pandemic, M: F = 50:18) (P = .705) (Fig-2). There were no significant changes in the hospital stay during the prepandemic (9.3 ± 2.9) period and pandemic period admissions (9.1 ± 4) (P = .851). The mean duration of ulcer in the prepandemic period was 9 days and the same during the pandemic period was 10.8 days (P = .269). Co morbidities DM was present in 12(66.66%) study participants in the prepandemic and 40(58.82%) participants in the pandemic period (P = 1.000). Diabetes Mellitus (DM) was present in 16 (88.88%) study participants in the prepandemic and 42(61.76%) participants in the pandemic period (p= 1.000). HTN was noted in 8 (44.44%) study participants in the prepandemic and 32(47.05%) participants in the pandemic group (p=.705). CVD was present in 4(22.22%) study participants in the prepandemic and 10 (14.70%) in the pandemic group (p= 1.000). PAD was present in 16 (88.88%) and 38 (55.85%) study participants in the prepandemic and pandemic groups, respectively (p= .248). CKD was present in 4 (44.44%) and 12 (17.47%) study participants in the prepandemic and pandemic groups, respectively (p=1.000). The amputation rate in the prepandemic and pandemic phases was 4.48 per 1000 and 10.30 per 1000, respectively (Table-1). The above chart shows distribution of complications after amputation.

Presence of Ulcer was present in 16 study participants in the prepandemic and 34 participants in the pandemic period (p=0.006*). Acute Limb Ischemia was present in 1 study participants in the prepandemic and 10 participants in the pandemic period (p = 1.000). Chronic Limb Ischemia was present in 15 study participants in the prepandemic and 32 participants in the pandemic period (p =1.000) (fig-3).

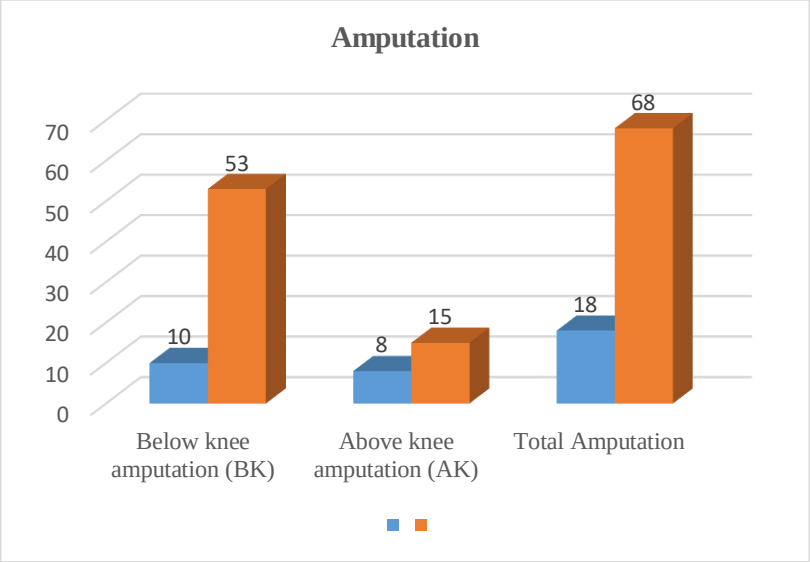

Figure 1: Below-knee and above-knee amputations in the prepandemic and pandemic periods.

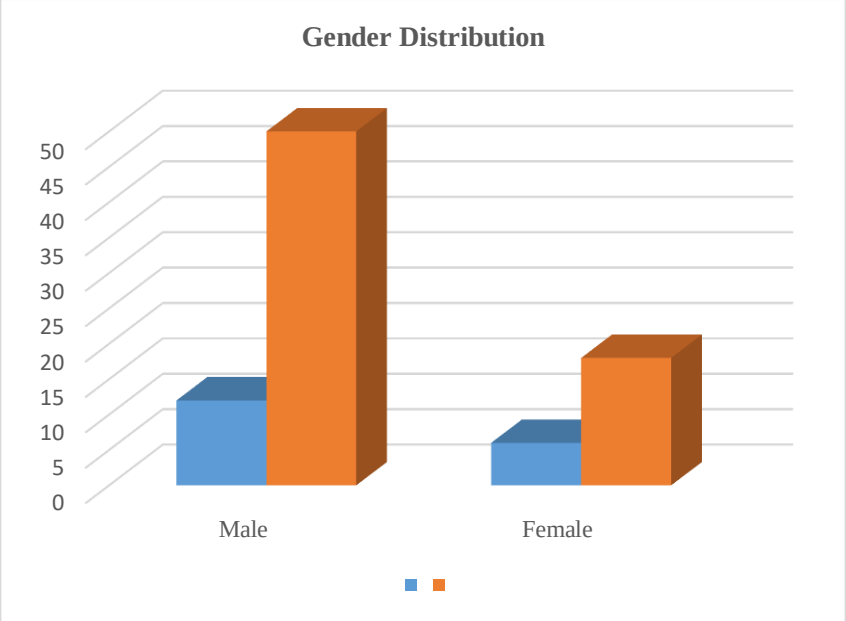

Figure 2: Gender-wise distribution of amputations during the prepandemic and pandemic periods

Table-1: Co-Morbidities prepandemic and pandemic period (N=86)

	Group A	Group B
Smoker	12 (66.66%)	40 (58.82%)
DM	16 (88.88%)	42 (61.76%)
HTN	8 (44.44%)	32 (47.05%)
CVD (Cerebrovascular disease)	4 (22.22%)	10 (14.70%)
PAD (Peripheral vascular disease)	16 (88.88%)	38 (55.85%)
CKD	4 (44.44%)	12 (17.47%)

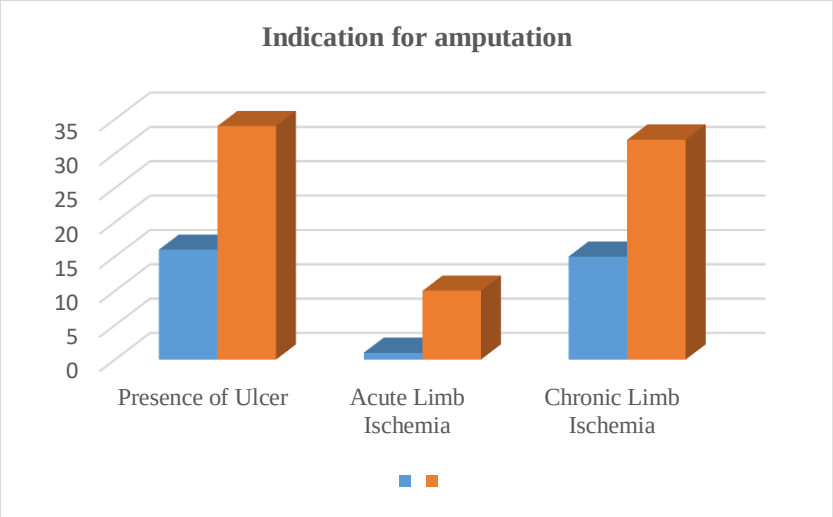

Figure 3: Indication for amputation during the prepandemic and pandemic periods

4. Discussion

In amputations, the indications are many and the pattern varies from place to place. The majority of the study participants were male. Males are at risk of trauma, especially in developing countries where male population work outside exposed to accidental hazards [13]. This resembles the study conducted by Caruso et al [13] which indicated increased diabetic foot problems during the pandemic in tertiary care settings. Among major amputations, BK amputations were higher in number than AK in both the pandemic and prepandemic groups. The overall prevalence of major amputations was higher during the pandemic lockdown compared to the prepandemic period. There was a 54.1% increase in major amputations noted. This might be due to the increased severity of diabetic foot infection in the pandemic period [14].

The reason might be the outcome of postponing the routine visit, improper diet, nonadherence to medications, and physical inactivity. Missed hospital visits or postponing the routine visit in this contest is defined as not visiting the physician as per the schedule, which is usually discussed in their previous visits as per the need/risk of the patient. High-risk patients are usually advised to visit their diabetologist and foot care specialists every 3 months. Improper diet can be defined as inconstant dietary habits in opposition to the advice of their physician/dietitian. In an online pilot survey, 20% of the study participants recorded they were not following the diet as before the lockdown [15]. No adherence to medications is not to take medicines as prescribed by the doctor. This no adherence can be intentional or no

intentional. People with diabetes are advised to do minimal physical activity (30 min per day) in any form including walking, exercises, and yoga. Not doing the minimal physical activity to control the glycemic index is considered as physical inactivity. In terms of risk factors for diabetes-related amputations, glycemic control, peripheral neuropathy, and PAD are generally considered to play a vital role [16, 17]. A higher prevalence of PAD and peripheral neuropathy prevalence was noted in the study participants in the pandemic group than the prepandemic group. Practices like telemedicine were also practiced in this pandemic globally [18]. In addition to the teleconsultation, home visits by the podiatrists and/or the other paramedical staff were practiced.7 This combination of treatment in treating the wound can save the limbs and avoid the patients' rush to emergency care at the 11th hour. Even though these services were available, they might not be affordable for all the patients who seek these services due to their socioeconomic status, especially in a developing country like India. During this pandemic, the low socioeconomic groups' routine income was affected [19]. This might have worsened the condition. The presence of complications of diabetes, history of previous minor surgeries, eGFR, and presence of PAD were considered as risk factors for the major amputations [20]. Rate of amputation had increased twice in the pandemic period than in the prepandemic period. The number of major amputations decreased in the early pandemic period and progressed during the late pandemic period.

5. Conclusion

Number of major amputations increased a lot in COVID-19 era compared to non COVID-19 era due to lack of regular follow-up for this panic COVID situation. The prevalence of diabetes-related major amputations during the COVID-19 pandemic. From the results of this study, we observed there was a delay in seeking health care during the pandemic period when compared to the prepandemic period. And there was a notable increase in the number of major amputations. This study shows the indirect effect of the COVID-19 pandemic on people with diabetes, resulting in the increased prevalence of major amputations (BK and AK amputations) which might cause a drastic impact on their quality of life. Furthermore, these emphasize the need for easy and routine access to foot-care specialists to prevent avoidable amputations.

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