

ORIGINAL ARTICLE

CAUSES OF PEDIATRIC LIMB AMPUTATIONS AT TIKUR ANBESSA SPECIALIZED HOSPITAL AND THE ROLE OF TRADITIONAL BONE SETTERS (“WOGESHAS”).

Seid Mohammed Yasin, MD¹, Birhanu Ayana, MD¹, Bahiru Bezabih, MD¹, Biruk L. Wamisho, MD¹

ABSTRACT

Introduction: Limb amputation in pediatric age group is relatively infrequent compared to adults and is often associated with profound social, psychological and economic impacts on the growing child and family. There is few published literature specifying the cause of limb amputation in pediatrics in Ethiopia. The aim of this study is to determine the cause and patterns of paediatric limb amputation at 'Tikur Anbessa' specialized hospital and make recommendations towards reducing the incidence.

Methods: This was a retrospective study conducted at 'Tikur Anbessa' Specialized teaching Hospital between May 2005 and April 2015. Data were retrieved from medical records and operation logbook of all pediatric patients aged 15 years and below who underwent limb amputations during the study period. Information regarding age, sex, indications and levels of amputation were studied.

Results: A total number of 99 patients with 102 amputations were involved in the study. Their age ranged between 4 and 15 years with mean age of 10.5 (SD ± 3.2) years. There were 75 boys and 24 girls (male: female ratio=3.1:1). The most common indication for limb amputation was gangrene arising from treatment of limb injuries by traditional bone setters, locally called “Wogeshas” (55.5%), followed by malignancy (29.2%) and trauma (11.1%). An intractable bone and soft tissue infection accounted only for 2% of the amputations (2). Three limb amputations in one patient and two in another one were due to a condition with unclear vascular etiology resulting in multiple gangrenous limbs. Majority of the amputations were in the upper limbs.

Conclusion: Traditional bone setters' practice related gangrene, late presenting musculoskeletal malignancy and trauma were the three most common causes for pediatric limb amputation in Ethiopia. Given that, all are non-communicable conditions, we can conclude that the majority of the amputations could have been prevented by provision of health education, early presentation and appropriate treatment in a modern health facility.

Keywords: pediatrics, limb amputation, gangrene, traditional bone setters, “Wogeshas”.

INTRODUCTION

Limb amputation as a treatment is one of the most ancient of all surgical procedures with a history of more than 2,500 years dating back to the time of Hippocrates. Amputation surgery in children is a relatively uncommon procedure. The causes of limb amputation among children differ between and within countries (1-3). Surveys of specialized child amputee clinics in developed countries indicate that approximately 60% of childhood amputations are secondary to congenital limb deficiencies, and 40% are secondary to acquired conditions (4,5). Studies from developing countries report the reverse, with almost all amputations in pediatrics being due to acquired causes (1). Acquired amputations most often are secondary to trauma, followed by neoplasm and infection. The procedure is usually indicated as a last resort when limb salvage is impossible after the limb is dead or dying, viable but non-functional or when it is threatening the patient's life.

In Ethiopia, little published data exists on the cause of amputation in children. Two studies performed on preventable cause of amputation on general population re-

vealed that trauma and limb gangrene as a leading cause of amputation where peripheral vascular disease and traditional bone setter's gangrene were the major causes (6,7). The loss of limb causes significant morbidity and often has profound economic, social and psychological effects on the individual and families, especially in developing countries like Ethiopia where the prosthetics and rehabilitation facilities are scarce (1). Therefore, the aim of this study was to determine the pattern and causes of amputation in pediatric age group in order to inform clinical decision and determine preventive measures.

PATIENTS AND METHODS

This was a 10-year retrospective study conducted at Tikur Anbessa Specialized Hospital (TASH) between May 2005 and April 2015. During the study period a total of 102 amputations were performed in 99 patients. The Hospital is the largest tertiary referral and teaching hospital in the country providing emergency and elective orthopedics care.

¹Department of Orthopedic Surgery, College of Health Sciences, Addis Ababa University.

Corresponding author: e-mail. ayanabirhanu@gmail.com

The data were retrieved from medical records and operation theatre logbook of children aged 15 years and below who underwent limb amputation during the study period. Ethical approval was obtained for the study from the department ethical committee and College's IRB. The demographic data that were collected included the gender, age, cause of the amputation and the level of amputation. The collected data was then analyzed using Ms Excel 2010 software.

RESULTS

The amputation involved one extremity in 97 of the 99 children, three extremities in one child, and two extremities in another one child. The age ranged between 4-15 years with mean age of 10.5(SD) (± 3.2) years (Figure 1). There were 75 boys and 24 girls with male to female ratio 3.1:1. The most common cause of amputation was traditional bone setter's gangrene, which accounted for 5 (55.5%) of the 99 cases, followed by malignancies, 29/99 (29.2%), while trauma and infection accounted for only 11/99 (11.1%) and 2 (2.0%), respectively (Table 1).

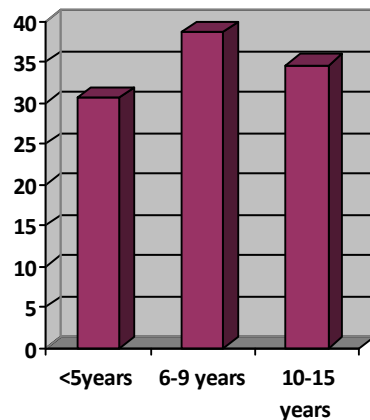


Figure 1: Age distribution of amputations due to Traditional Bone Setter's gangrene

Table1: Cause of amputation in pediatric patients, Tikur Anbessa Specialized Hospital, May 2005- April 2015

Causes	Fre- quency	%
Traditional Limb splintage	55	55.5
Malignancies	29	29.2
Severe Trauma	11	11.1
Infection	2	2.0
Others	2	2.0
Total	99	100

The levels of amputation, which is shown in Table 2, reveals that upper limb amputation is more common than lower limb amputation. There were 24/99 (23.5%) above elbow amputations, 25/99 (24.5%) below elbow amputations, 2 (1.9%) elbow disarticulations, 1 (1.0%) shoulder fore-quarter amputation, and 3 (2.9%) finger amputations; and on the lower extremity, there 23/99 (22.5%) above knee amputations, 15(14.7%) below the knee amputations, six (5.9%) knee disarticulations, two (1.9%) hip disarticulations, and one (1.0%) ray amputation.

Table 2: Levels of amputation in pediatric patients, Tikur Anbessa" Specialized Hospital, May 2005- April 2015.

Level	Number	%
Above Elbow Amputation	24	23.5
Below Elbow Amputation	25	24.5
Through elbow	2	1.9
Shoulder forequarter amputation	1	1.0
Above Knee Amputation	23	22.5
Below Knee Amputation	15	15.0
Through knee	6	5.8
Through hip	2	1.9
finger amputations	3	2.9
Ray amputation	1	1.0
Total	102	100

The patterns of amputation due to traditional bone setter gangrene shows that upper limb is the most common affected (Figure 2). The major indications for upper limb amputations were gangrene due to tight splintage of injured limb by traditional bone setters, while malignancies were the main indication for lower limb amputations. Figure 3 (a, b) shows patients with limb gangrene after a tight splint has been applied on the extremities.

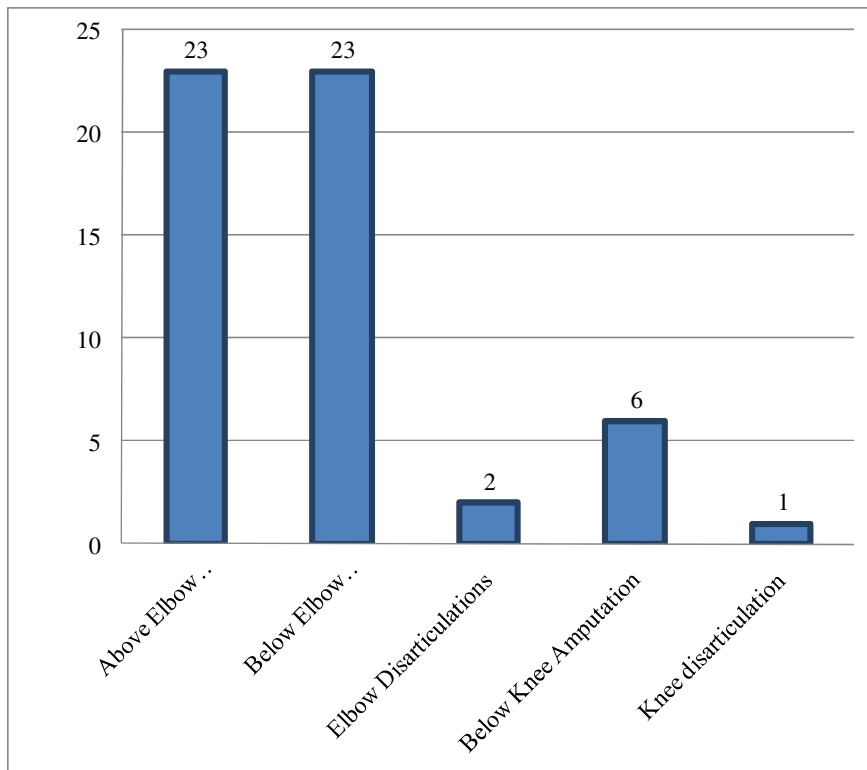


Figure 2: patterns of limb amputations due to traditional bone setter's gangrene



a



b

Figure 3 (a, b): "Wogesha" traditional tight splintage causing gangrene

DISCUSSION

Limb amputations in the pediatric age group can result in severe disability and can cause profound economic, social and psychological effects on the growing child and family (1). This study show that all the indications for amputation were from acquired causes unlike the developed countries where such cases only represented 40% (4). This signifies that amputations in children are mostly preventable. In this study, traditional bone setter's gangrene is the commonest cause of amputation followed by

malignancy and trauma. Studies conducted in Nigeria has revealed that traditional bone setter's gangrene was the main indications for limb amputation in children (8-10), which is comparable to our finding. This is also comparable to another study conducted here in Southern Ethiopia, "Arba Minch" region where 51% of limb amputation was due to traditional bone setter's gangrene (7). In contrast to our findings reports from other s studies revealed that post-burn contractures as the most common indication for amputation in children followed by congenital limb deformity and tumors(1). Another study done in northwestern Tanzania reported that post-burn contractures com-

monly involving the upper limbs were the most common indications for amputation in children (11). Reports from Cameroon revealed that in patients below 15 years of age the leading cause of amputation was trauma followed by malignant tumors (12). This pattern has also been reported in children by other studies (9,13).

Traditional bone setting (“Wogesha” practice) is widely practiced throughout Ethiopia, but the benefit and the atrocities committed by them had never been studied or reported. In some African countries up to 85% of patients with fractures present first to the traditional bone setters before going to hospitals and hence this mode of care delivery cannot be overlooked (14). In India, it was estimated that traditional bone setter treat about 60% of trauma patients (15). Poverty, lack of education, the culture, traditional beliefs of the community and the hostile reception at public health care settings all contributed to the continuity of their unacceptable practice (16,17). This shows that the condition is a major public health problem in developing countries and needs interventions to reduce the incidence of limb loss. Provision of basic fracture care training to traditional bone setters all over the country and health education to public can significantly reduce the incidence of amputation due to bone setter gangrene. This has been proved in study performed in southern region of Ethiopia (7).

Malignancy constituted the second most common cause of amputation in this study. This is in agreement with other studies (9,12,13). Majority of our patients with musculoskeletal malignant tumor presents late, thereby precluding limb salvage procedures and leading to limb amputation. In addition to this lack of experienced expertise and materials to perform limb salvage surgery obliged us to opt for amputation. Trauma was the third commonest indication of amputation in our pediatric population. Although uncommon, amputation become necessary in chronic soft tissue and bone infection and idiopathic peripheral vascular diseases presented to our hospital. Similar finding was reported from Nigeria (1).

In our study amputation is more frequent in boys compared to the girls. This is consistent with the findings by other authors, (10-12,18). This is probably arising from the more active nature of boys and greater exposure to trauma compared with girls. It also seems that this is why most common cause of amputation in our study was traditional bone setter’s gangrene and trauma. The mean age of our patient were 10.5 years, which is similar with reports from the United State (9,20).

The majority of amputations were performed in the upper limbs and traditional tight splintage of limb caused 87% of amputation on upper extremity. This finding is in agreement with findings reported by other studies that upper limb gangrene commonly occurs as a result of fracture mismanagement by traditional bone setters (8, 9, 19). The most common level of amputation was below elbow (BEA) accounting for 24.5% followed by above elbow amputation (AEA). In Contrast to these findings, other authors report that lower extremity amputation is more often than the upper extremities (10, 11, 20). This is probably because upper limb fractures found to be more common than lower limb fracture in study performed in the same setting earlier (21). Given the fact that there is no functionally sound upper limb prosthesis so far in our setup, the amount of functional impairment being caused by such simple and preventable errors is huge.

In conclusion, our findings show that most amputations are due to preventable conditions. Hence, we recommend sustained and aggressive health education to the public to discourage patronage of traditional bone setters and develop awareness programs for early presentation and advanced treatment of musculoskeletal tumors. Additionally, the medical education and regulatory bodies should design a program that can give basic training of fracture care to traditional bone setters (TBS) to ensure safe application of splints and early identification of signs of ischemia. It is also necessary to register “Wogeshas” in order to make them accountable for their action and to perform the traditional practice with legal ground.

ACKNOWLEDGMENT

We would like to extend our deepest appreciation to the Operation Theater staff of the Department of Orthopedics, Pediatric Orthopedic Ward staffs of TASH, and all Specializing Residents for their dedication in caring for these innocent and growing children. We also thank the head nurses of Operation Theater and the ward for keeping the patient’s documentation properly.

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