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Original Research Article

Epidemiology of hand surgical cases operated in tertiary referral centers in Dhaka

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ABSTRACT

Background: Hand surgical cases in Bangladesh are managed both by orthopedic and plastic surgeons. There are very limited number of hand surgeons available in the country. Tertiary referral centers especially in the city of Dhaka cater for most of the hand surgery patients treated in the country. Objective were to understand the needs of the community for hand surgery.
Methods: This rretrospective study spanning July, 2017 to June, 2018- used data from the operation register of the Burn and Plastic surgery department, DMCH (Dhaka medical college and hospital) and hand surgery department, NITOR (National institute of traumatology and orthopedics).
Results: Of the sample of 2000 cases, 1000 data were collected from Dhaka medical college hospital, of which 670 (67%) were routine cases and 330 (33%) were emergency department cases. Of the 1000 cases from NITOR including 317(31.7%) routine cases and 683 (68.3%) cases from emergency department. Demography of the population 76% male and 24% female cases from DMCH; and 80% male and 20% female from NITOR. In Burn and Plastic surgery department of DMCH the percentage of diagnosed cases-acute burn (55%), acute trauma (9.5%), PBSC (21.5%), post trauma deformity (9%), and congenital cases (5%) and in NITOR- acute burn (1%), acute trauma (68%), PBSC (9%), post trauma deformity (20%), and congenital cases (2%) respectively.
Conclusions: This study shows the needs of the community for hand surgery and the portfolio of cases performed would be guide for an evidence-based approach to the development of services and training of hand surgeon in Bangladesh.

Keyword: Hand surgery, Burn, Traumatic injury, Amputation

INTRODUCTION

Hand injuries are a frequent occurrence that usually requires surgical treatment in specialized centers on a regular basis.[1-3] Hand injuries account for more than a quarter of all unintentional injuries.[4,5] Accidents in everyday life are the most common cause. Other traumatic upper limb injuries are usually observed in the context of sports-related injuries or road traffic accidents.[1,4,6] The importance of adequate hand injury prevention programs has been emphasized, and some safety measures have been described and implemented.[7-9]

The impact of hand trauma on individuals and the community are significant and according to national electronic injury surveillance system "NEISS", laceration of finger and hand fractures are most commonly affected anatomical sites by work-related injuries in the United States emergency service.[10-15]

It is well known that for optimum outcomes there is a need for competencies in the management of hand injuries and in spite of the existence of a national hand surgeon society there is a need for greater numbers of practicing surgeons competent in the skills needed for hand surgery and access to their services by the population.[11,16] Surgical volunteerism by female plastic and reconstructive surgeons (Reconstructing Women International, RWI) from India, Pakistan, Kenia, Tanzania have provided access in urban primary health care centers. for a surgical mission in urban primary health care centers (Lifebuoy friendship hospital, Emirates friendship hospital, and Rongdhonu Friendship hospital) (2009-2020); These are organized and owned by the Bengal Non-governmental organization (NGO) Friendship, and a land based permanent hospital in Shyamnagar (2020).[12,17]

The aim of this study was to understand the community needs for hand surgery as an evidence-based approach to design and develop a curriculum for hand surgery training and provide a guide to the ministry of health, Bangldesh in the development of hand surgery services for the country.

METHODS

This rretrospective study of data sampled equally from, DMCH and, NITOR from July, 2017 to June, 2018. A sample size of 2000 cases were chosen to sufficiently reflect the portfolio of operated cases in hand surgery and the 2 sites were chosen purposefully as it represented the 2 largest referral centers for hand surgery in Dhaka. Data from the operation register books of these two sites were used in this investigation after receiving approval from hospital administration. The data were categorized into the following categories: routine/emergency, gender distribution, diagnosis of the cases, operative procedures, type of anesthesia and primary surgeons' grade.

Inclusion criteria were all upper limb cases performed in the operating room within 10 days of admission. Recurring cases and patients who refused to participate in the study were excluded. We made every effort to collect accurate data. Data were coded, cleaned and entered into a laptop and analyzed utilizing IBM SPSS (Version-23) in keeping with the objectives of the study.

RESULTS

From DMCH-670 routine cases and 330 cases from emergency department and from NITOR-317 routine cases and 683 emergency cases.

Table 1: Distribution of cases according to site, (n=1000).

DMCH, n (%)		NITOR, n (%)	
Routine case	**Emergency case**	**Routine case**	**Emergency case**
670 (67)	330 (33)	317 (31.7)	683 (68.3)

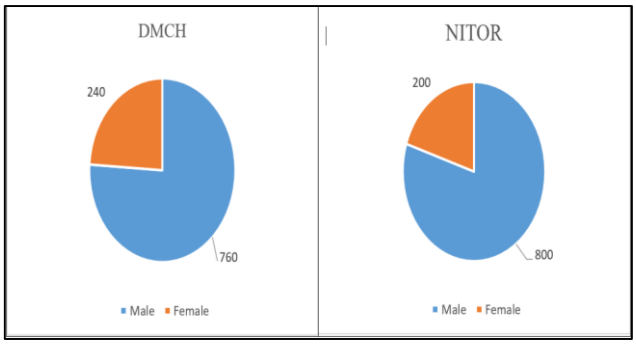

Figure 1: Gender distribution of the population.

Figure 1 shows the gender distribution of the population; 760 (76.0%) male and 240 (24%) female cases from DMCH; 800 (80%) male and 200 (20%) female from NITOR.

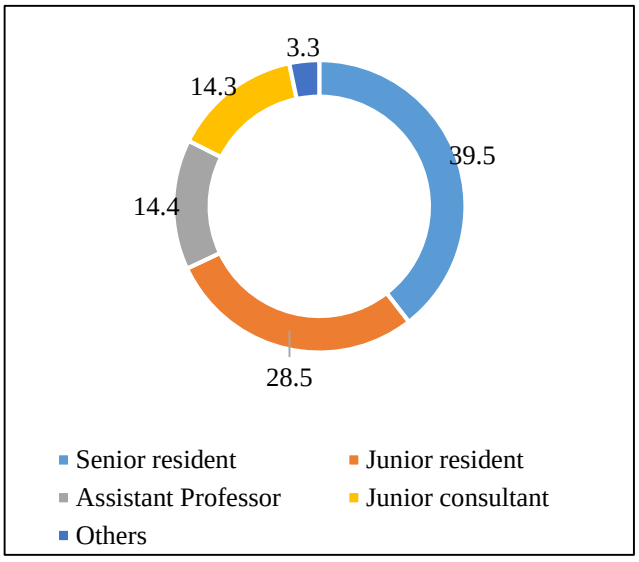

Figure 2: Distribution of primary surgeons' grade.

The majority of cases were being performed independently by-senior residents 790 (39.5%) and junior resident 570 (28.5%). And only 32% (assistant professor 288 (14.4%), junior consultant 286 (14.3%) and others 66 (3.3%) respectively) were conducted by specialist grade surgeons.

DMCH being the regional centre for burns and plastic surgery accounted for- acute burn cases (55%), acute trauma (9.5%), PBSC (21.5%), post trauma deformity (9%), and congenital cases (5%) and in NITOR-acute

burn (1%), acute trauma (68%), PBSC (9%), post trauma deformity (20%), and congenital cases (2%).

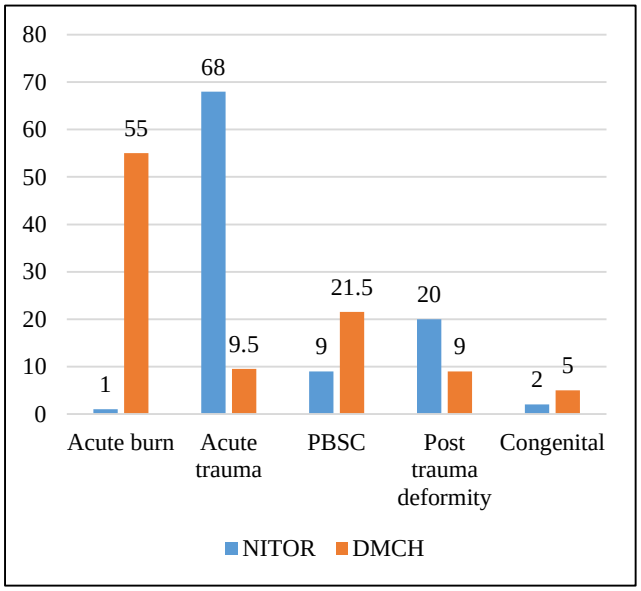

Figure 3: Distribution according to diagnosis of presented cases.

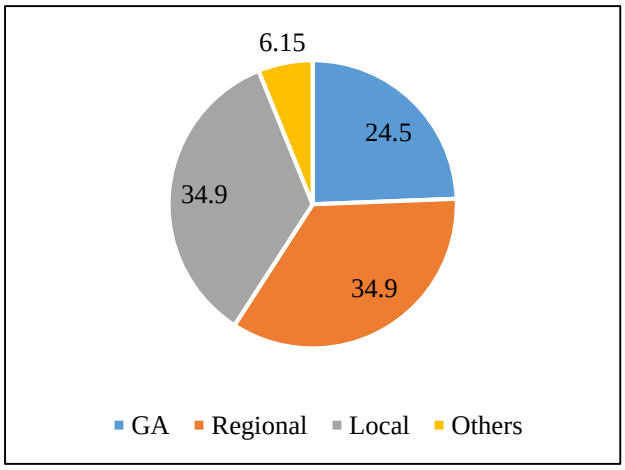

Figure 4: Distribution of cases according to type of anesthesia.

This figure demonstrated type of anesthesia. 60% were administered by anesthetist and the rest were administered by surgeon. Here, general anesthesia 481 (24.5), regional anesthesia 698 (34.9), local anesthesia 698 (34.9) and others 123 (6.15) respectively.

This figure demonstrated the operating procedures performed among the routine cases in NITOR. Here, deformity correction (17%), nerve repair and reconstruction (13.6%), tendon repair and reconstruction (12.5%), PBSC (10.5%), flap (9.8%), tumor excision (9.2%), others (8.7%), fracture fixation (7.2%), tendon+nerve (repair and reconstruction) (6.5%), amputation (5.0%) respectively.

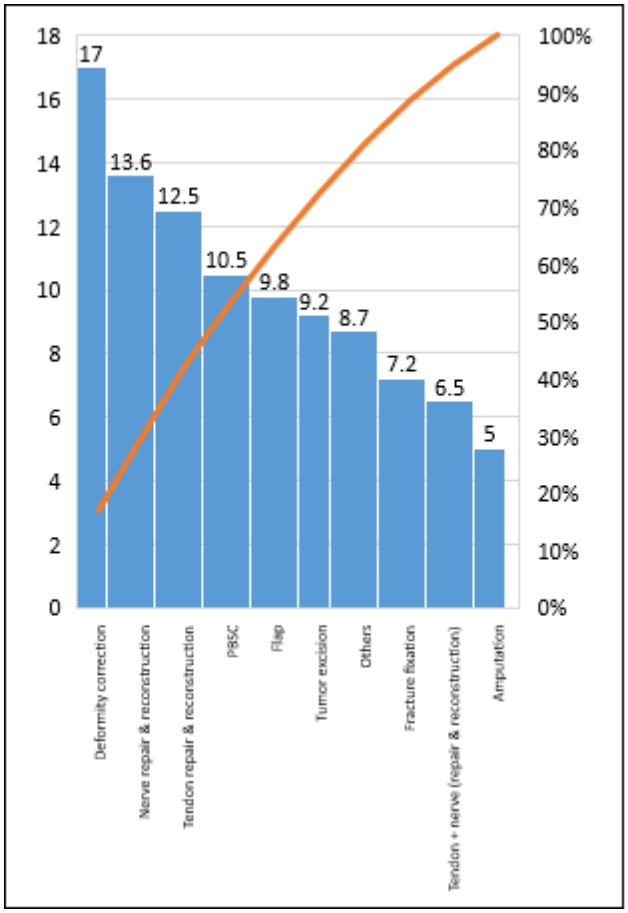

Figure 5: Pareto chart of Pareto chart of routine cases in NITOR according to operative procedure.

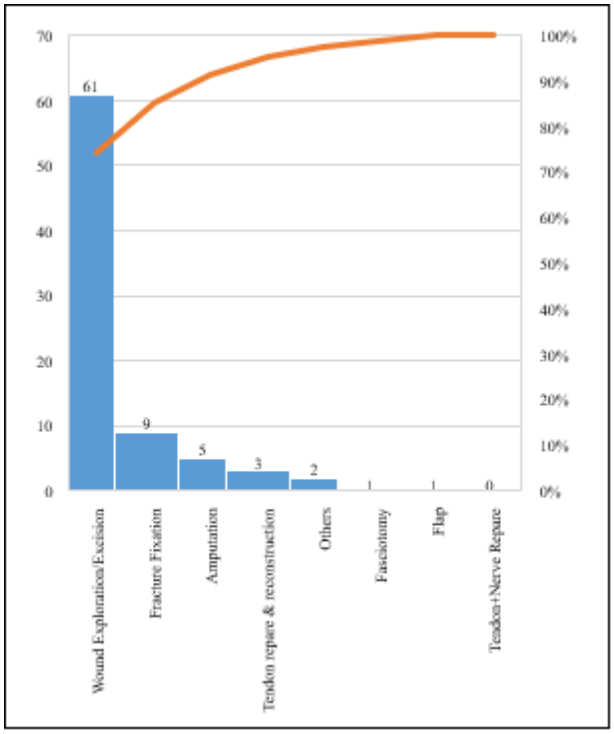

Figure 6: Pareto chart of emergency cases in NITOR according to operative procedure.

This figure demonstrated the operating procedures performed among emergency cases in NITOR. Here, wound exploration/ excision (61%), fracture fixation (9%), amputation (5%), tendon repair and reconstruction (3%), other procedure (2%), fasciotomy (1%), tendon + nerve repair (0%) and flap surgery (1%) respectively.

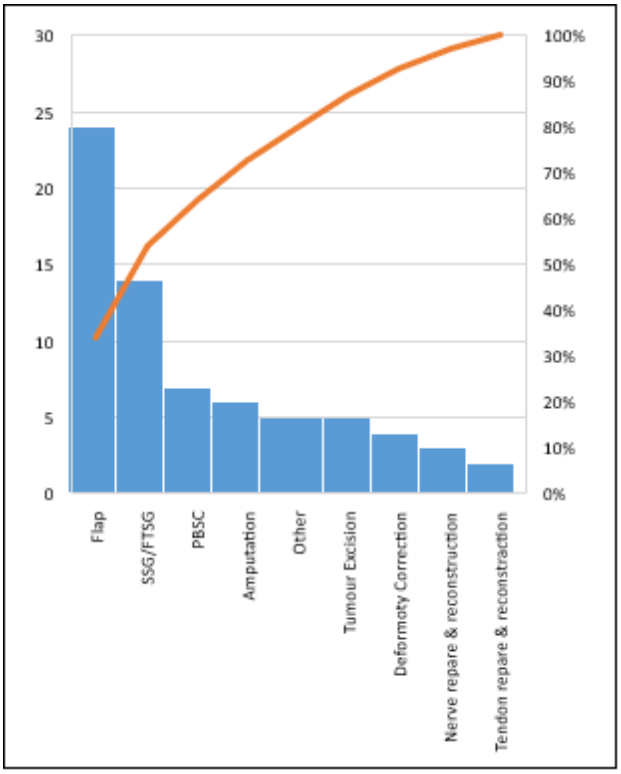

Figure 7: Pareto chart of routine cases in DMCH according to operative procedure.

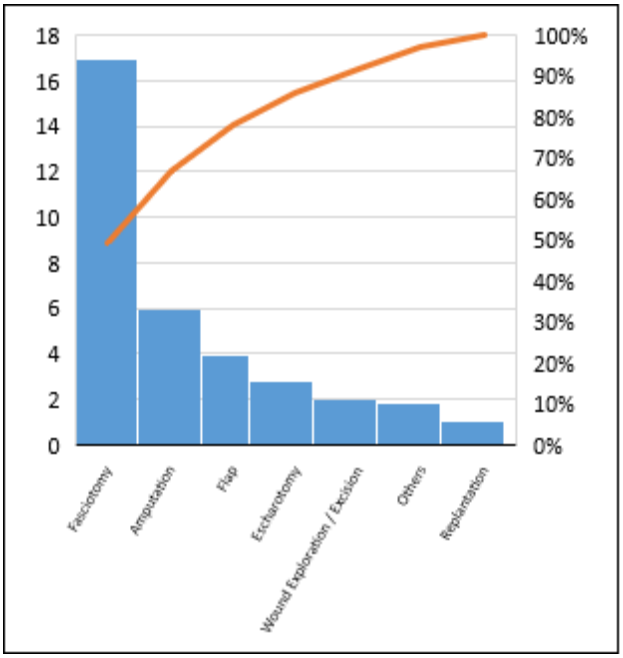

Figure 8: Pareto of emergency cases in DMCH according to operative procedure.

This figure demonstrated the operating procedures performed among routine cases in Burn and Plastic surgery department of DMCH. Here, flap surgery (24%), SSG/FTSG (14%), PBSC (7%), amputation (6%), deformity correction (4%), other operating procedure (5%), tumor excision (5%), nerve repair and reconstruction (3%), tendon repair and reconstruction (2%) respectively.

This figure demonstrated the operating procedures performed among emergency cases in burn and plastic surgery department of DMCH. Here, fasciotomy (17%), amputation (6%), flap surgery (3.9%), escharotomy (2.8), wound exploration/excision (2%), other procedure (1.8%), and replantation (1%) respectively.

DISCUSSION

This study has for the first time shown the epidemiology and portfolio of hand surgery operations done in Bangladeshi hospitals. The sample studied provides sufficient saturation of the types of case being performed.

Out of 2000 cases, 1000 data were collected from Dhaka medical college hospital, including 670 routine cases and 330 emergency department cases. 1000 data were collected from NITOR including 317 routine cases and 683 cases from emergency department. In this study, 760 (76.0%) male and 240 (24%) female cases from DMCH; 800 (80.0%) male and 200(20.0%) female from NITOR. In another study conducted in Bangladesh, male predominance (89% male. 11% female) was observed.[13] Hand injuries represent up to 20% of all injuries treated in emergency unit.[14]

Majority of the cases were unsupervised by specialist. Senior residents and junior residents performed the most cases independently. No specialist were in the operating room when these were conducted. Only 31% cases were conducted by specialist grade surgeons.

As the regional center for burns and plastic surgery, the DMCH burn and plastic surgery department accounted for 55% of acute burn cases. However, because NITOR is an orthopedic hospital, it has the lowest percentage of acute burn cases and the number of acute trauma cases diagnosed is higher in NITOR. High voltage electric burns are the most dangerous severe and potentially fatal burns complications, limb loss and longer hospital stay.[15,16]

During the surgical procedure, the anesthetist administered 60% of the anesthesia and the surgeon administered the remaining 40%.

According to operating procedures performed among the routine cases in NITOR. Here, deformity correction (17%), nerve repair and reconstruction (13.6%), tendon repair and reconstruction (12.5%), PBSC (10.5%), flap (9.8%), tumor excision (9.2%), others (8.7%), fracture

fixation (7.2%), tendon+nerve (repair and reconstruction) (6.5%), amputation (5.0%) respectively. And in emergency department in NITOR wound exploration/ excision (61%), fracture fixation (9%), amputation (5%), tendon repair and reconstruction (3%), other procedure (2%), fasciotomy (1%), tendon + nerve repair (0%) and flap surgery (1%) had done respectively. Over again, the operating procedures performed among routine cases in Burn and Plastic surgery department of DMCH. Here, flap surgery (24%), SSG/FTSG (14%), PBSC (7%), amputation (6%), deformity correction (4%), other operating procedure (5%), tumor excision (5%), nerve repair and reconstruction (3%), tendon repair & reconstruction (2%) had done respectively. Again, the percentage of operating procedures performed in emergency department in NITOR-wound exploration/ excision (61%), fracture fixation (9%), amputation (5%), tendon repair and reconstruction (3%), other procedure (2%), fasciotomy (1%), tendon + nerve repair (0%) and flap surgery (1%) had done respectively.

According to Begum et al most electrical burns affected the upper extremities and the usual level of amputation was below the elbow (48.5%), the second was above the radiation amputated elbow (32.54%), amputation because of ray 9.46%, amputation of multiple fingers 7.01%, the shoulder joint disarticulation in 1.77% cases, right hand 49%, left hand 40%, bilateral involvement in 11% cases.[13] According to Nwadinigwe et al 49.4% of high voltage injury victims needs amputation, mainly upper extremities as the hand is the normal primary point of contact.[17] This study shows that extensor tendon injuries are more common than flexor tendon injuries the index finger represents the most common injuries of finger.[18]

This is the first study from Bangladesh to explore the types of cases being performed and the limitation of this study is its retrospective nature and the fact that the sites are urban centers. No peripheral and rural centers data was analyzed. Also, no outcome measure was collected. Future research should collect data prospectively and patient reported outcome measures to obtain a much more inclusive and meaningful conclusions.

Limitations

The present study was conducted in a very short period due to time constraints and funding limitations. The small sample size was also a limitation of the present study.

CONCLUSION

This study it has shown that the following are the common conditions requiring surgery in Bangladesh. The training programs for surgeon and health professionals involved in the care of hand injured and afflicted patients should incorporate these conditions into their curriculum as mandatory topics to be mastered. This would also guide surgical volunteers to plan their volunteer projects based on these conditions to be meaningful and adding value to all stakeholders.

The distribution of the cases shown in this study, should be used by planners of the ministry of health to design specific and targeted clinical service that would cater to these conditions. These services can be innovative in the delivery with the use of bespoke trained paramedical staff and using telemedicine to provide remote access to hand surgery expertise in the rural areas.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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