

Awareness of Hand Surgical Conditions and Management, in General Practitioners and Emergency Department Physicians in India

Darshan Kumar A. Jain¹, Abhishek Sugumar Kesav², Ashwini Varadha Rajan²

Author Affiliation: ¹Assistant Professor ²Resident, Department of Orthopaedics, M.S. Ramaiah Medical College and Hospital. MS Ramaiah Nagar, Mathikere, MSRIT Post, Bengaluru, Karnataka 560054, India.

Corresponding Author: Darshan Kumar A. Jain, Assistant Professor, M.S. Ramaiah Medical College and Hospital. MS Ramaiah Nagar, Mathikere, MSRIT Post, Bengaluru, Karnataka 560054, India.
E-mail: jaindarshan81@gmail.com

Received: 03 October 2017, **Accepted on:** 12 October 2017

Abstract

Hand surgery is an emerging subspecialty in India, which depends on referrals from general physicians (GPs) and emergency medicine physicians (EMDs). An appropriate referral requires the referring physician to have knowledge and understanding of common hand surgical conditions and awareness of hand surgery as a subspecialty. The aim of this study is to assess and compare the knowledge and awareness of hand surgical conditions among GPs and EMDs. The sample size for our study was calculated to be 39 GPs and 23 EMDs following a pilot study. The questionnaire based cross sectional study was conducted among GPs at primary care hospitals and EMDs at tertiary care hospitals, following which the results were analysed. A total of 62 physicians responded to our study (39 GPs and 23 EMDs). Areas in which knowledge gap was noted include penetrating palm injuries, carpal tunnel syndrome, osteoarthritis and peripheral nerve repair. Interventions to bridge the gap may be required at many levels such as undergraduate education, post graduate education and continuing medical education. These interventions would not only improve the primary care provided but also facilitate a smooth referral process to hand surgeons for further management.

Keywords: Hand Surgery; Knowledge of Hand Surgery; General Practitioners; Emergency Medicine Department Physicians.

Introduction

Hand and reconstructive microsurgery is an emerging subspecialty in India. The National board of India accredited training programme was initiated in the year 2001 as a fellowship of the national board (FNB), and recognised by the MCI in 2016. With rapid industrialization and increase in road traffic accidents, hand and upper limb injuries have risen significantly. The number of road accident injuries in India between the years 2001 and 2011 have increased by 5.8% [1]. The knowledge and understanding of common hand surgical conditions and awareness of the subspecialty among the referring physicians in India is not known.

The first point of contact for a patient with hand surgical conditions would usually be a general practitioner or an emergency medicine physician at a nearby hospital and not the hand surgeon themselves [2]. Inappropriate primary care, compounded by a knowledge gap regarding the treatment options are a hurdle to an appropriate referral and can lead to poor outcomes.

Literature from Canada and Singapore have shown a knowledge score of 53% and 65% among GPs pertaining to a customized questionnaire [2,3]. There is a dearth of literature relating to the knowledge among GPs and EMDs in India, which justifies the intent to determine the awareness and knowledge of hand surgical conditions among GPs and EMDs in Bangalore.

The referral process for highly specialised hand care has been problematic [3]. Studies have shown that physicians may have a negative perception about surgical management of conditions such as rheumatoid arthritis and tetraplegia, possibly leading to a bias towards non-surgical treatment of these conditions, which has a negative impact on the referral process [4].

The aim of this study was to assess and compare knowledge and awareness of hand surgical conditions among general practitioners and emergency medicine physicians, which may help us understand the areas requiring intervention at undergraduate, post graduate and continuing medical education programmes.

Materials and Methods

General practitioners registered at the state medical council within a 5-km radius of MS Ramaiah medical college and hospital were included in the study by a random sampling method. EMDs from various tertiary care hospitals in Bangalore were included in the study.

The doctors who volunteered for the study were first given a detailed explanation of the study and then the questionnaire to be filled in approximately 20-30 minutes. The questionnaire consisted of 21 questions which were divided into two parts, first part of which consisted of 4 questions regarding their practice and referral system (Table 1), and the second part had 15 questions to test the knowledge on hand surgical conditions and its management (Table 2). A copy of the answers was given to the physicians once they completed the questionnaire. The study excluded those physicians who had any previous

training in hand surgery .

The sample size was calculated by initially conducting a pilot study on 7 GPs and 7 EMDs using the knowledge analysis section of the questionnaire (Table 2). The result of the pilot study revealed the mean and standard deviation of the knowledge scores to be 8/15 (SD - 0.816) for GPs and 11.6/15 (SD - 1.73) for EMDs. Based on the above results, using IBM SPSS Version 18, with a power of 95% and alpha error of 1%, and keeping in mind various subgroup analyses, a sample size of 23 Emergency Medicine Department Physicians, and 39 General Practitioners was obtained.

The descriptive statistics of the knowledge score is presented in terms of mean and standard deviation with a 95% confidence interval. The variables such as knowledge on the existence of the subspecialty and knowledge scores is expressed in terms of percentage. Independent t test was used to compare knowledge differences between different subgroups.

The study protocol was placed before the ethics committee of M S Ramaiah Medical college in the meeting held on 1 st April 2016 and the same was approved by the ethics committee.

Results

A total of 62 physicians completed the questionnaire (39 GPs and 23 EMDs) . Among the GPs 26 (66.7%) had more than 10 years of experience while 13 (33.3%) had less than 10 years of experience. 15 GPs and 12 EMDs were aware of hand surgery as a subspecialty and a dedicated training programme for the same in India, but only 1/15 GP and 2/12 EMDs out of those, referred patients to hand

Table 1: Questions about Practice and Referral System

Sl. No	Questions	Practice and Referral System
1.	Years of Experience:	
	a. >10 years	
	b. <10 years	
2.	How many patients were referred to hand specialists	
	a. Nil	
	b. 1-5 patients	
	c. 5-10 patients	
	d. >10 patients	
3.	Awareness of special training for hand surgery	
	a. Yes	
	b. No	
4.	Attended any workshop on Hand Surgery Previously	
	a. Yes	
	b. No	

Table 2: Knowledge analysis questionnaire

Knowledge Analysis	
Sl. No	Question and Answers
1.	Appropriate treatment for penetrating palm injury <ul style="list-style-type: none"> Wash the wound and allow for secondary healing Wound lavage and steri-strips/tissue glue Send patient to the hospital for further treatment Perform an X-ray, wound suture if no fracture is detected
2.	Wound that is at the highest risk of infection <ul style="list-style-type: none"> Organic contamination of the wound on the hand Laceration over the dorsum of the hand from a clean knife Laceration over the palmar of the hand from a clean knife Burst laceration of the pulp after a cupboard door slam on a digit
3.	Most common wrist injury after a fall on an outstretched hand <ul style="list-style-type: none"> Scaphoid fracture Fracture of the distal radius Scapholunate ligament tear Perilunate dislocation
4.	Radiograph of typical osteoarthritis <ul style="list-style-type: none"> Ankylosis of the joint Subchondral erosions Joint space narrowing and osteophytes Periarticular erosions
5.	Which is not a sign or symptom of severe carpal tunnel syndrome? <ul style="list-style-type: none"> Tingling and numbness over the radial 3 fingertips Numbness of hands only in cold rooms Wasting of the Thenar muscles, especially the abductor pollicis brevis Loss in manual dexterity of fingers
6.	Efficacious non-surgical management of carpal tunnel syndrome <ul style="list-style-type: none"> Vitamin B complex (B6) Ultrasonography therapy Heat treatment Steroids (oral or injectable)
7.	Cubital tunnel syndrome is due to compression of <ul style="list-style-type: none"> Radial nerve Ulnar nerve Median nerve
8.	Most common bacteria in hand infection <ul style="list-style-type: none"> Staphylococcus aureus Escherichia coli Eikenellacorrodens Pseudomonas aeruginosa
9.	Is it possible to repair the peripheral nerves? <ul style="list-style-type: none"> Yes No
10.	Most common cause of non traumatic swelling over the wrist <ul style="list-style-type: none"> Synovial sarcoma Ganglion Squamous cell carcinoma Osteosarcoma
11.	A patient with "mallet" finger be initially treated with <ul style="list-style-type: none"> Removable splint of finger Extension splinting of distal inter-phalangeal joint only Physical therapy Buddy taping to other finger

12. Which of the following amputations can be surgically reattached?
 - Complete amputation
 - Partial amputation
 - None of the above
 - **Both of the above**

13. Guyon’s canal syndrome involves which nerve?
 - Median nerve
 - **Ulnar nerve**
 - Radial nerve

14. The most appropriate preservation method to transport a completely amputated limb or finger to reattach is?
 - Wrap limb in moist gauze and plastic cover and place in ice box
 - **Wrap limb or finger in moist gauze and plastic cover and place in box with ice and water**
 - Wrap in moist gauze and then place in ice
 - Wrap in moist gauze and plastic bag and then place in ice

15. Most important factor in favour of reattachment limb or finger is?
 - **Less time of ischemia**
 - No Contamination
 - Site of amputation
 - Amount of damage

specialists. None of the respondents of either had attended any workshop or been part of a hand surgery rotation previously (Table 3).

Our study found that the respondents answered 65.1% of the questions correctly. The knowledge score was calculated by awarding 1 point for each correct answer, which was then analysed. The average knowledge score for both groups was calculated to be 9.7. The areas in which respondents of both groups fared well was found to be on non-traumatic swelling

of hand [GPs – 36/39 (92.3%), EMDs – 22/23 (95.6%)] and common organism in infection of hand [GPs - 36/39(92.3%), EMDs – 21/23 (91.3%)] (Table 4 and Chart 1). A knowledge gap was noted in GPs in questions on carpal tunnel syndrome, cubital tunnel syndrome and preservation method of amputated limbs, while EMDs physicians were noted to have knowledge gaps in the questions on cubital tunnel syndrome and method of preservation of amputated limbs.

Table 3: Results of Practice and referral system questions

Questions on practice and referral system		EMDS		GP’S	
		Result (Number of positive responses / Total number of respondents)	Percentage (%)	Result (Number of positive responses / Total number of respondents)	Percentage (%)
Years of experience	<10 YEARS	20/23	86.9	26/39	66.7
	>10 YEARS	3/23	13.04	13/39	33.3
How many patients referred to hand specialists		2/23	8.69	1/39	2.56
Awareness of hand surgery as a subspecialty	Yes	12/23	52.1	15/39	38.46
	No	11/23	47.8	24/39	61.5
Attended workshops previously		0/23	0	0/39	0

The Chi square test was also used to analyse the difference in knowledge score between the two groups with respect to specific questions.

A statistically significant difference in knowledge score between the GPs and EMDs was found in four questions – penetrating injuries to the palm,

radiology of osteoarthritis , carpal tunnel syndrome and repair of peripheral nerves (Table 4 and chart 1). We also found a statistically significant correlation between the years of experience and the knowledge score of EMDs (by independent t test) .

Table 4: Knowledge score analysis

Serial number of questions for knowledge score analysis	Emergency Medicine Department physicians		General Practitioners		P- Value (Chi-Square)
	Score (Number of correct answers/Total number of respondents)	Percent (%)	Score (Number of correct answers/Total number of respondents)	Percent (%)	
1	21/23	91.3	26/39	66.7	0.029*
2	17/23	73.9	31/39	79.5	0.612
3	15/23	65.2	29/39	74.4	0.444
4	22/23	95.7	29/39	74.4	0.034*
5	15/23	65.2	10/39	25.6	0.002*
6	18/23	78.3	29/39	74.4	0.729
7	9/23	39.1	14/39	35.9	0.799
8	21/23	91.3	36/39	92.3	0.889
9	19/23	82.6	23/39	59.0	0.054*
10	22/23	95.7	36/39	92.3	0.06
11	14/23	60.9	18/39	46.2	0.263
12	16/23	69.6	20/39	51.3	0.16
13	13/23	56.5	16/39	41.0	0.24
14	8/23	34.8	12/39	30.8	0.70
15	15/23	82.6	26/39	66.7	0.17

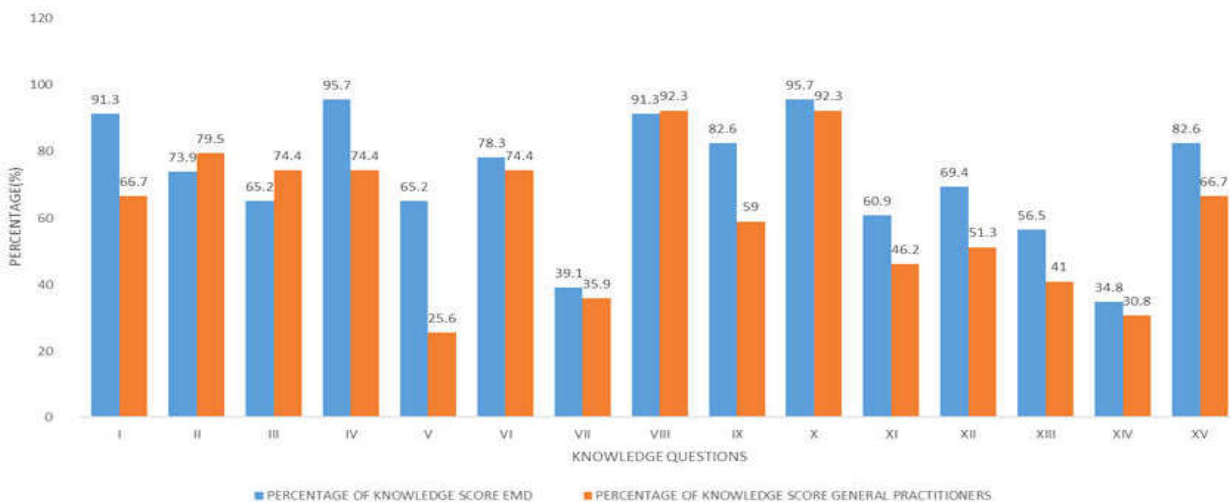


Fig. 1: Knowledge score percentages

Discussion

Hand and reconstructive microsurgery is a highly specialised surgical field. Hand surgical conditions are to be attended by qualified and technically competent surgeons to obtain optimal outcomes and avoid preventable complications. GPs and EMDs must be able to recognise conditions which would require urgent surgical management to initiate the referral system for which the knowledge gap with respect to some hand surgical conditions must be bridged and awareness of the subspecialty must be improved among referring physicians.

Our study found knowledge gaps between both groups regarding the method of transportation of

amputated limbs. The typical method involves wrapping the limb/digit in moistened gauze and placing it within a plastic bag with crushed ice and water. It has been observed that tissues arrive macerated because of being submerged in water or frozen as a result of being in direct contact with ice. It was noted in a study that it is common for potentially replantable limbs or digits to arrive inadequately cooled or further damaged and hence making them unsalvageable [5]. A knowledge gap was also noted among the general practitioners regarding penetrating palm injuries where 33.3% of respondents did not think that these injuries require evaluation by a hand surgeon. This could lead to delayed identification of injuries to critical structures in the palm such as nerves, vessels and tendons .

Studies have shown orthopaedic and musculoskeletal conditions to be one of the most common complaints in patients presenting to hospitals [6]. It has also been noted in American and Canadian studies that musculoskeletal education at the undergraduate level is inadequate for preparing future doctors for management of these conditions [7,8]. Hence, there is a need for intervention to improve the knowledge and awareness at various levels such as undergraduate, post graduate and continuing medical education to facilitate adequate primary care and prompt referral of hand surgical conditions.

We acknowledge the limitations of the study, firstly that of a small sample size, which would not be representative of the larger cohort of physicians in India. Secondly, the study was conducted in a small geographical area, thus not taking into consideration geographical variations in the referral process, which would require further investigation.

Conclusion

Present study shows the need for intervention to improve the knowledge and awareness at various levels such as undergraduate, post graduate and continuing medical education to facilitate adequate primary care and prompt referral of hand surgical conditions for better functional outcome for patients.

References

1. Manisha Ruikar, National statistics of road traffic accidents in India; *Journal of Orthopaedics, Traumatology and Rehabilitation*; 2013 Jan-Apr;6(1);1-6.
2. Catherine M. Curtin; Jeffrey Yao. Referring Physicians' Knowledge of Hand Surgery. *American association for hand surgery*, 2010 Jan 27;5:278-285.
3. Kin Ghee Chee, Mark Edward Puhaindran, AlphonsusKhin Sze Chong; *General practitioners knowledge of hand surgery in Singapore : a survey study Singapore Med J* 2012;53(8): 522.
4. Alderman AK, Chung KC, Kim HM, Fox DA, UbelPA; *Effectiveness of rheumatoid hand surgery: contrasting perceptions of hand surgeons and rheumatologists. J Hand Surg [Am]*. 2003;28:3-11.
5. M S Lloyd, T C Teo, M A Pickford, P M Arnstein; *Preoperative management of the amputated limb. Emerg Med J* 2005;22:478-480.
6. Mackay C, Canizares M, Davis AM, Badley EM. *Health care utilization for musculoskeletal disorders. Arthritis Care Res (Hoboken)* 2010;62:161-9.
7. DiCaprio MR, Covey A, Bernstein J. *Curricular requirements for musculoskeletal medicine in American medical schools. J Bone Joint Surg Am* 2003;85-A:565-7.
8. Pinney SJ, Regan WD. *Educating medical students about musculoskeletal problems. Are community needs reflected in the curricula of Canadian medical schools? J Bone Joint Surg Am* 2001;83-A:1317-20.

