

Incidence of Chronic Regional Pain Syndrome I Following Foot & Ankle Fracture in Elderly Patient

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ABSTRACT

Objective: To find the incidence of chronic regional pain syndrome (CRPS) following foot & ankle fractures in elderly patient.

Methods: This prospective study conducted in Liaquat National Hospital from January 2016 to December 2016. Patients were collected in study from clinics as well as from emergency. Both operative & conservatively managed patients with foot and ankle fractures above 40 years of age were included. Patients were regularly follow up 1 week, 6 weeks, 12 weeks & 6 months. Patients were screened for CRPS 1 using Budapest screening criteria & those who fulfilled criteria then were physically attended in pain clinic for diagnosis using Budapest criteria.

Results: 506 patients with foot and ankle fractures were attended in total. From these 220 (43.47%) patients had one symptom of CRPS, but only 08 (1.58%) patients met the criteria of diagnosing chronic regional pain syndrome. The incidence of chronic regional pain syndrome in following study is 1.58 %

Conclusion: Many patients experience symptoms of CRPS following foot & ankle fractures. According to our observation, incidence is higher in elderly population & those who are immobilized and kept non-weight bearing for prolonged time.

Key words: Chronic Regional Pain Syndromes, Incidence, Ankle and Foot Fractures, Elderly Patients,

INTRODUCTION

Chronic Regional Pain Syndrome (CRPS) is a painful condition of chronic nature, which is disproportionate in time or degree to usual cause of any trauma & includes pain, sensory, sudomotor & trophic changes [3]. Most patient presented with pain, hypoesthesia & hyperpathy [7]. Usually fractures are the most common initiating event but increase age, female sex was also considered to be a risk factor as shown in previous studies. Diagnosis of CPRS is difficult & based on history & physical examination. Different studies have been done to test different imaging modalities to diagnose CRPS & classifying it into different types & its indicators [6,12,13].

Pathophysiology of CPRS is not known & several theories have been postulated to explain CPRS [11]. Many diagnostic criteria have been made for diagnosis

of CPRS, but most well known are IASP and Budapest criteria [3].

Review of literature showed increase incidence of CPRS following distal radius but incidence after ankle fracture in elderly is controversial. No local study present to determine the exact incidence of CPRS in elderly patient following foot & ankle fractures. Budapest criteria was introduced in 2007 & internationally accepted. The aim of study is to find incidence of CPRS following foot & ankle fractures in middle aged to elderly population using Budapest criteria.

METHODS

The study was conducted from January 2016 to December 2016. Patients were followed up till June 2017. Patients were recruited from emergency department & orthopedic clinics of Liaquat National hospital after approval from ethical review board. Patients aged greater than 40 years were included in this study who sustained foot or ankle fractures diagnosed by plain radiography. Both operative & conservatively managed patients were included in this study. Exclusion criteria was history of any radiculopathic pain before fracture, fracture in both

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upper & lower limb, major nerve damage, patient having symptoms of CPRS 2, use of medication containing vitamin C, and open fracture. Operative patients were allowed range of motion exercises & weight bearing according to institutional protocol while conservatively managed patient was kept in cast for average 6 weeks with physiotherapy started later.

Patients were followed in clinic at 1week, 6 weeks, 12 weeks & 6 months. Enquiry about CRPS symptoms by attending doctor on the basis of screening criteria of Budapest was done. Patients were asked about pain & symptoms from each of 4 categories as mentioned in Table - I.

Patients who had one or more symptoms on screening were sent to pain specialist for proper evaluation of CRPS using Budapest criteria by pain specialist.

RESULTS

Total 613 patients presented to our emergency and outpatient department with foot and ankle fractures. Out of these only 506 met the criteria for our study and hence were enrolled after informed consent. Of these 506 patients at three months follow up 220 had one symptom according to Budapest screening criteria and hence were further evaluated according to Budapest

criteria. The details of these patients in mentioned in Table – I.

Budapest criteria evaluation of these 220 patients revealed that only 8 patients met the criteria to be labeled as suffering from CRPS 1. Of these 8 patients, 2 females had bimalleolar ankle fracture managed conservatively in a cast for 3 months one of them is diabetic having 69 year of age other having age of 55, third patient was male having multiple metatarsals fracture having 66 years of age & who had managed conservatively, fourth was diabetic male of 60 year of age having talus fracture managed conservatively, while fifth patient was 53 years old female having tibial pilon fracture managed by internal fixation. Sixth patient was 49 years old diabetic female had tibial pilon fracture treated by internal fixation. Last two patients had bimalleolar fracture; one was 73 years old elderly female diabetic in which internal fixation of bilmalleolar fracture done but remain immobile for longer period of time & last patient was 47 year old female in which internal fixation of ankle fracture was done but kept non weight bear for 10 weeks due to skin problems and infection. 20 patients having symptoms on screening lost to follow up.

Table 1: Clinical diagnostic criteria for CRPS

| Clinical diagnostic criteria for CRPS |
|--|
| To make the clinical diagnosis, the following criteria must be met: To make the clinical diagnosis, the following criteria must be met: Continuing pain that is disproportionate to any inciting event Must report at least one symptom in three of the four following categories: Sensory: Reports of hyperesthesia and/or allodynia Vasomotor: Reports of temperature asymmetry and/or skin color changes and/or skin color asymmetry Sudomotor/Edema: Reports of edema and/or sweating changes and/or sweating asymmetry Motor/Trophic: Reports of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin) Must display at least one sign at time of evaluation in two or more of the following categories: Sensory: Evidence of hyperalgesia (to pinprick) and/or allodynia (to light touch and/or temperature sensation and/or deep somatic pressure and/or joint movement) Vasomotor: Evidence of temperature asymmetry (> 1 °C) and/or skin color changes and/or asymmetry Sudomotor/Edema: Evidence of edema and/or sweating changes and/or sweating asymmetry Motor/Trophic: Evidence of decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin) There is no other diagnosis that better explains the signs and symptoms |

Table 2: Patient demographics

| | |
|-------------------|-----------------------|
| No. of patients | 506 |
| Age in years | 41-82 (57.4 mean)SD?? |
| Sex | |
| Male | 334 |
| Female | 172 |
| Fracture Location | |
| Ankle | 209 ??% |
| Talus | 13 |
| Calcaneum | 18 |
| Foot fracture | 210 |
| Multiple | 53 |
| Treatment | |
| Non-operative | 359 ??% |
| Operative | 147 |
| Smoker | 52 |
| Betel addict | 39 |
| Diabetic | 107 |

Table 3: Patient characteristics diagnosed with CRPS

| S. No. | Age (years) | Sex | Fracture type | Treatment option | Cast/ immobilization duration (weeks) | Non-weight bear duration (weeks) | Diabetes | Addiction |
|--------|-------------|-----|---------------|------------------|---------------------------------------|----------------------------------|----------|---------------|
| 1 | 69 | F | BM* Ankle | Non-operative | 12 | 14 | Yes | No |
| 2 | 55 | F | BM* Ankle | Non-operative | 12 | 16 | No | Betel/Tobacco |
| 3 | 66 | M | Metatarsal | Non-operative | 6 | 6 | No | No |
| 4 | 60 | M | Talus | Non-operative | 10 | 12 | Yes | Smoker |
| 5 | 53 | F | Distal Tibia | Operative | 2 | 6 | No | No |
| 6 | 49 | F | Distal Tibia | Operative | 6 | 8 | Yes | No |
| 7 | 73 | F | BM* Ankle | Operative | 6 | 12 | Yes | No |
| 8 | 47 | F | BM* Ankle | Operative | 2 | 10 | No | No |

*BM = bimalleolar

DISCUSSION

The incidence of chronic regional pain syndrome in our study following following foot & ankle presentation is 1.58%. This is higher as compared to previous studies [3]. Incidence is less than following distal radius fracture as observed by other authors [1,4]. The higher incidence in our study could be due to the age of the patients as we selected middle aged to elderly patients for the study.

In this study we used BUDAPEST criteria for screening & diagnosing patient of chronic regional pain syndrome. The updated criteria have been shown to

improve both specificity & sensitivity of CRPS diagnosis & the only standardized, internationally recognized & validated criteria for diagnosis of CRPS [3]. While most of previous studies had used IASP for diagnosing CRPS [4] which might affect their results & showed higher incidence. Most of previous study conducted was observed CRPS following distal radius fracture [8,9] so this study will serve as primary data source on CRPS following foot & ankle fracture in elderly population.

The study of Bullen had studied incidence of chronic regional pain syndrome following foot & ankle fracture in all age groups & had used telephonic

method for screening of the patient [3] while in our study we have used follow up visits for screening of patient symptoms which decreases the chances of miscommunication.

The higher incidence in our study is due to elderly population & previous studies have shown linked to increasing age as a risk factor for CRPS [4]. Most of incidence in our study was reported in female as compared to male [6:2] as previous studies had also shown female predication for female sex [4]. Another important factor is diabetes & results shown to be increased incidence in diabetic patient [5] & studies have to be done to show their effect further. Delay in rehabilitation & prolonged casting were also prone patient to CRPS [1].

Another strength of our study was the use of strong diagnostic criteria for the diagnosis of chronic regional pain syndrome. Patients were screened in clinic by doctors, which decreases communication gap, & prevent bias. A longer follow up visits of 6 months also increase strength of study [1] with only 20 patient had lost to follow up during study. Diagnosis of CRPS by pain specialist also prevents false positive result. Potential weakness of our study could be that both operative & non-operative patient was included, which might affect result. Presence of different co morbidities can also effect study result in elderly population. Cast application by different personnel in emergency & clinic might affect study result.

CONCLUSION

The observed higher incidence of CRPS in foot & ankle fractures could be due to elderly population but it is still lower when compared to distal radius fractures. Presence of diagnostic criteria helps in diagnosis & treatment of this debilitating disease. Larger studies should be done to evaluate risk factor & treatment of CRPS. Gold standard diagnostic criteria for chronic regional pain syndrome have yet to be devised.

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