

Epidemiology of Orthopaedic Morbidities in Pilgrims of Shri Amarnath Yatra

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ABSTRACT

Introduction: In a religiously diverse country like India, visits to holy shrines situated at geographically diverse topographical spots are a common norm. "Shri Amarnath shrine" is one of the most sought after and difficult pilgrimage in the country and because of the suboptimal terrain, people who flock to take this trip have to face major medical issues, every year, moreover in absence of streamlined adequate medical facility.

Aim: To describe the Epidemiology of Orthopaedic morbidities at high altitude pilgrimage sites and formulate an advisory for the public and the authorities alike of the critical steps required to minimise the same.

Materials and Methods: All the individuals with isolated orthopaedic morbidities who presented to our base camp hospital at Baltal from July 11th to 26th 2017 were enrolled in the study. Patients with head injuries, Blunt trauma chest and Blunt trauma abdomen were excluded. Patients with aggravation of preexisting orthopaedic morbidities (low back ache, knee

pain) were included in the study. Also persons who either used helicopter or small litters as a mode of travel were also excluded.

Results: Out of the 253 patients presented to us 54.7% were males and 45.3% were females. About 60% of the patients were from the northern and eastern part of India. Patients between the age group of 21-40 years were most frequently injured. About 60 percent of the patients sustained injury while travelling on foot and the mode of injury was fall. Aggravation of the preexisting low back ache was the most common (33%) orthopaedic morbidity. Most common fracture encountered was that of the distal end of radius. Most common reason for immediate referral was open fractures.

Conclusion: Adequate exploration and addressal of the trauma victims during pilgrimage is the need of the hour. Results of this study may be used for planning preventive measures and strategies for strengthening the medical infrastructure at the base camp hospitals so as to decrease the orthopaedic morbidity.

Keywords: Fractures, Mountain terrain, Orthopaedic injuries, Pilgrimage

INTRODUCTION

India is a religiously diverse nation with Hinduism being one of the world's oldest faith, which is followed by its majority. Hindus have traditional sacred places where people from all over the world travel to seek the blessings of the almighty.

The Himalayas are one of the most difficult geographical terrains, for seekers of adventure as well as those with religious sentiments. Pilgrims have been travelling to high altitude sites since time immemorial, and they outnumber the trekkers climbing the different peaks of the Himalayan range [1]. These religious pilgrimages are organised trips with aids from the government, religious groups and individuals alike.

Shri Amarnath "yatra" is one of the most prominent Hindu pilgrimage trips which is situated at the height of 3900 meters above sea level, in the Indian state of Jammu and Kashmir [1]. The desire to see the Shiva temple inside a cave with the lord's natural "linga" made of snow, brings thousands of devotees from far and wide who take this difficult road to the shrine. There are two main routes to reach it [1]. The longer route is via Pahalgam and is relatively less difficult, while the shorter Baltal route has a steep ascent, which is cumbersome. Pilgrims travel on Foot, horseback, or on a Helicopter.

Government of India organizes this pilgrimage every year in the months of June to August. It takes 1 to 5 days depending on the route and the mode of travelling. Estimated 400,000 to 600,000 pilgrims visit the shrine every year. It is considered the longest among all holy tracks [1].

The pilgrims face multiple challenges due to the high altitude and difficult terrain. Due to their religious motivation many people undertake high altitude pilgrimage every year. In the spur of

the moment even some elderly people do so who are not so fit. Although there is a facility of helicopter but even then they had to travel some part of the trip on horseback or on foot. Because of this unaccustomed exertion and previous medical illnesses there is considerable mortality and morbidity due to high altitude sickness and trauma. Due to narrow and uneven mountain tracks, accidental injuries are also very common. Retrieving of the injured from such a high altitude is a real challenge for the authorities.

Some hospital based studies on the Shri Amarnath Yatra pilgrims, have shown that medical conditions like coronary artery disease, complications of diabetes, and peptic ulcer disease are very common and important reasons for hospitalisation [2-5]. There is no study on the common orthopaedic injuries sustained by these pilgrims, which could be fractures, sprains and strains etc.

To best of our knowledge, this is the first field based study focusing specifically on the orthopaedic implications. All other previous published studies have been hospital or a medical school based. One study is from Government Gousia Hospital, Srinagar and the two other studies are from Sher-i-Kashmir Institute of medical sciences, Srinagar [2-5]. This study was conceptualised to examine various orthopaedic morbidities, both traumatic and non traumatic in pilgrims. We discuss the epidemiology of these injuries and give some guidelines to be followed to minimise them in pilgrims based on our experience.

MATERIALS AND METHODS

A cross-sectional prospective observational study was conducted at Baltal base camp between 11th July to 26th July 2017. After taking the ethical clearance from the authorities and seeking informed consent from all patients coming to base camp hospital with orthopaedic

morbidities, both traumatic and atraumatic were assessed and enrolled. Patients with blunt trauma chest, blunt trauma abdomen and head injury were excluded from the study. Also, persons who either used helicopter or small litters as a mode of travel were also excluded. Patients with aggravation of preexisting orthopaedic morbidities (low back ache, knee pain) were included in the study.

All patients were assessed clinically and radiographs were obtained, if required. Demographic parameters like age, sex, region of India/NRI, morbidity, mode of injury, referral reasons and given treatment were recorded. Analgesics were given for the management of soft tissue injuries. Fractures and dislocations were reduced under intravenous sedation given by the anaesthetist in the team. After closed reduction adequate splintage was given in the form of slabs and cast and patients were kept under observation for atleast 24 hours for compartment syndrome. Open fractures were dealt with thorough lavage, dressings, intravenous antibiotics, analgesia, I.V. fluids and adequate splintage by crammer wires/Thomas splint/slabs before immediate referral to a higher centre.

RESULTS

A total of 253 patients presented to us with isolated orthopaedic complaints. Demographic details of the cases are described in [Table/Fig-1]. Analysis of the medical records revealed that majority of patients were travellers from northern part of India followed by that from eastern and central. Most of the injuries sustained were by males (54.94%). Young patients between the age group of 21-40 years were frequently injured (36%). There was no patient above 70 years. This could be due to cap of 70 years imposed by shrine board. Most common mode of injury was by fall. Travelling on foot was the more common method of travel amongst these patients.

Variable	N (%)
Region of India	
Northern India	89 (35.2)
Southern India	17 (06.7)
North Eastern India	05 (02.0)
Eastern India	63 (24.9)
Western India	20 (07.9)
Central India	59 (23.3)
Sex	
Male	139 (54.9)
Female	114 (45.1)
Age group (years)	
<20	06 (2.4)
21-40	92 (36.3)
41-50	65 (25.7)
51-60	84 (33.2)
61-70	06 (2.4)
>70	0 (0.0)
Mode of travel while sustaining injury	
By Foot	152 (60.1)
By Pony	101 (39.9)

[Table/Fig-1]: Demographic details.

Details of orthopaedic morbidities are described in [Table/Fig-2] and reasons for morbidities and referral are described in [Table/Fig-3]. The aggravation of any pre-existing orthopaedic illness was the most common complaint, followed by traumatic events like soft tissue injuries of the ankle and wrist. The most common fracture was the fracture at distal end of the radius. The most common mode of injury was fall either while walking or from a horse or pony. The most common reason for immediate referral was open fractures. [Table/Fig-4-9] gives a basic idea of the infrastructure and the facilities available at the medical base camp.

Variable	Number
Lower Back ache aggravation	83
Ankle sprain	36
Ankle fracture	06
Both Bone leg fracture	01
Clavicle fracture	04
Fracture distal end radius	22
Fracture intertrochantric	01
Fracture jones	03
Fracture metacarpal/phalanx	08
Fracture montegia	01
Fracture proximal humerus	03
Fracture radial head	01
Fracture ribs	07
Fracture Both Bone forearm	03
Elbow dislocation	02
Increased Knee Pain	36
Shoulder dislocation	02
Soft Tissue Injury Knee	09
Soft Tissue Injury Wrist	25

[Table/Fig-2]: Details of orthopaedic morbidities.

Fracture	Number	Open/Closed
Clavicle	01	Open
Metacarpal/phalanx	03	02/01
Proximal Humerus	02	Closed
Distal end radius	06	03/03
BB Forearm	03	01/02
Intertrochantric	01	Closed
BB Leg	01	Open
Ankle	06	02/04

[Table/Fig-3]: Details of patients requiring referral for surgical intervention.



[Table/Fig-4]: Base camp hospital at Baltal.



[Table/Fig-5]: X-ray room.



[Table/Fig-6]: Registration and medicine dispensing counter.



[Table/Fig-7]: Out Patient Department.



[Table/Fig-8]: Indoor patient ward.



[Table/Fig-9]: Dressing and plaster room.

DISCUSSION

High altitude pilgrimages are very common in India and many experience the ill effects of the high altitude. Apart from medical conditions, trauma is an important cause of mortality and morbidity. Most of the previous published studies (one conducted at Government Gousia hospital, Srinagar by Mir IS et al., and two at Sher-i-Kashmir Institute of medical science, Srinagar by Koul

PA et al., and Yatoo GH et al.,) on high altitude pilgrimage mainly focused on the medical conditions like high altitude pulmonary oedema, high altitude cerebral oedema, diabetes mellitus, coronary artery diseases, peptic ulcer disease and mental illnesses [2,4,5]. To best of our knowledge, this is the first medical camp based study of its kind estimating the orthopaedic burden of Amaranth yatra. Previous literature includes hospital based studies evaluating medical burden per se. Non traumatic surgical burden was estimated by one study [2].

In a study conducted by Al-Harhi AS et al., on Hajj pilgrimage highlighted the incidence of trauma during the Hajj period. Road traffic accident was the commonest mode of injury in their series and it was indicated that 83% of the trauma patients were either orthopaedic or neurosurgery cases [3]. On the contrary in this study, the most common injury was fall for obvious reasons. Similarly our study depicted the huge number of trauma cases which deserve more attention.

As per study conducted by Mir IS et al., of the 1,54,000 devotees who undertook the "yatra", in 2006, medical aid was provided to 40,082 pilgrims [2]. Of these 40,082 pilgrims, 172 were admitted on the surgical side for various non-traumatic surgical disorders [2]. No data was provided regarding the traumatic causes for the admission.

From July 2011 to Aug 2011, during the Shri Amarnath Yatra in 45 days period, 185 pilgrims were admitted to a hospital in Srinagar. Acute myocardial infarction, polytrauma, head injury, High altitude pulmonary oedema, gastroenteritis, diabetes, COPD and stroke were the diagnosis in these pilgrims in decreasing order of incidence. Six people died, out of which four were >65 years of age. We believe that most of the people who died, succumbed before being brought to the hospital in absence of prompt medical attention. This is highlighted by the fact that the recorded death toll in 2011 and 2012 among 600,000 pilgrims was only 239 [4].

Similarly in an another study conducted in year 2015 at a medical college level highlighted the total incidence of trauma victims close to 30% of the total patients received. It represents a significant proportion and the victims were between 21-72 years of age which is comparable to this study [5].

A study by Shah AR mentioned that number of shortcomings/dysfunctions had come up in the management of pilgrims around the holy cave. This study provided holistic overview of Amarnath pilgrimage and sum up the basic issues, challenges faced by the pilgrims [6].

Majority of the published medical literature of high altitude pilgrimage is from Gosainkunda Lake (4300 m), Nepal and Shri Amarnath Yatra (3900 m), India. These studies mainly focus on the medical conditions and they concluded that Acute Mountain Sickness, Coronary Artery Diseases, complications of diabetes mellitus, and peptic ulcer diseases are important reasons for admission [7]. Poorly acclimatised people from the plains are at high risk of developing these. The situation is worsened due to scarcity of the resources, lack of infrastructure, rapid changing weather and difficult terrain. Government has enforced mandatory thorough medical examination prior to any such high altitude pilgrimage [8]. But there are many flaws in this policy. Many of the medical certificates depicting their fitness for yatra are obtained by fraudulent means. Mostly the general practioners conduct the medical examination but mostly respiratory, cardiac and orthopaedic problems are anticipated. Somehow even some unregistered persons manage to commence the yatra.

However, orthopaedic injuries are manifestations of difficult geographical terrain that takes a toll on the body. These cannot be predicted and only way out is improving the conditions of the trail to the shrine making it easier to tread upon with minimal falls and slips leading to these injuries.

In the present study, age of the patients is an important issue. These patients between 20-40 years of age are the economically

productive, and accidents involving them in absence of proper management facilities, could prove detrimental and cause financial burden on the country as a whole. The difficult terrain with random ascents and descents could be the reason for the majority of injuries occurring due to falls or slips in patients. This highlights the importance of maintenance of the trail with adequate engineering inputs. Aggravation of pre-existing orthopaedic illnesses like backache is shown to be the most common ailment, and this highlights the importance of pre-conditioning and optimisation before undertaking the trip.

Based on the experiences of this study, we recommend the following measures for a successful and safe pilgrimage.

- i) Stringent Pre-yatra checkup should be done before registering the devotees for Amarnath pilgrimage and special travel arrangements for pilgrims with co-morbidities should be done, taking care of their medical co-morbidities.
- ii) Upgradation of the health care infrastructure on the way, including first aid centres and provision of airlifting.
- iii) Limitation of the number of pilgrims as per the available facilities, related to basic life amenities.
- iv) Travelling by pony or horse should be avoided if possible as it's a major cause of aggravation of low back ache in majority of the patients presented to us. Walking aids such as a stick or a cane and adequate footwear with a good grip are highly desirable.
- v) Physical exercises particularly aerobics and muscle strengthening exercises should be started as early as possible before the planned yatra.
- vi) There should be separate tracks for pony riders and pedestrians.
- vii) Proper diet, adequate acclimatisation, breathing exercises and medications are vital.
- viii) Track to the shrine should be maintained properly with aid of Government agencies.
- ix) Over enthusiasm is to be avoided and the helicopter should be used to cut short the duration of "yatra", by patients who are not accustomed to the hilly terrain.
- x) Adequate awareness about the potential challenges likely to be faced is to be imbibed through intensive educational efforts.
- xi) Education regarding safety measures such as proper footwear, clothing and padding around the knee joints should be advocated.

There were several difficulties faced during procuring results of the study at this place. Linguistic difficulties were there as there were patients from all over India, speaking different languages that makes history taking a bit difficult like knowing the mechanism of

injury. More-so-ever no previous medical record of the patients with preexisting co-morbidities was available. There were several workplace difficulties encountered like lack of good quality X-rays and specialised technicians and plaster assistants. These medical camps should be well equipped and supported by more medical personnel. Transportation of the patients to a higher centre is quite difficult in such scenarios due to huge gathering of people at a specific time and small area. Beside this there were several logistic difficulties encountered.

LIMITATION

The present study had several limitations. First of all it was conducted in a limited time at medical camp. Second it's a cross-sectional, single centre, single surgical team study with potential of selection bias of the patients enrolled in the study. No follow-up of the patients could be obtained due to short stay. Exact prevalence of the trauma victims cannot be commented upon.

CONCLUSION

Trauma is one of the leading causes of morbidity and mortality during pilgrimage. There is a heavy toll of Orthopaedic cases which needs to be explored and adequately addressed. Adequate preventive measures should be taken for a hassle-free and safe trip. Additionally, the establishment of adequate health care facility all through the trail to the shrine is of paramount importance, to initiate early treatment to decrease associated morbidity and mortality.

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