

Pattern of musculoskeletal trauma presenting in Combined Military Hospital, Muzaffarabad, Azad Kashmir: Trauma registry need of time

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Abstract

Objective: To determine frequency patterns of musculoskeletal injuries and its associated risk factors in CMH Muzaffarabad, Azad Kashmir.

Study design: Retrospective study

Study duration: Study duration was 12-months (January 2018 to December 2018).

Study settings: Study was conducted at Department of Orthopedics, CMH Muzaffarabad

Material and Methods: Data of 650-patients with musculoskeletal injuries was reviewed from January 2018 to December 2018. Ethical permission was taken from research approval board. Patient's data was reviewed for musculoskeletal injuries. Data was analyzed using SPSS version 24. Chi-square test was applied for measuring association between different variables. We consider results ≤ 0.05 as statistically significant.

Results: Total 650-patients were included in our study. There were 291 (44.8%) male and 359 (55.2%) female. Mean age of patients was 36.1 ± 9.2 SD. Among all the patients 650 (100%), 432 (66.5%) had bony injury and 218 (33.5%) had soft tissue injury. Injury site was spine in 18 (12.2%), upper limb 35 (23.8%), lower limb in 51 (34.7%), ankle 26 (17.7%) and knee in 17 (11.6%). Injury site was spine in 56 (8.6%), upper limb 140 (21.5%), lower limb in 330 (50.8%), ankle 70 (10.8%) and knee in 54 (8.3%). There were 214 (32.9%) tibia/fibula fractures and 116 (17.8%) femur fractures. Out of all upper limb injuries, 35 (5.4%) were dislocation, clavicle fractures in 32 (4.9%), fracture dislocation 28 (4.3%), spine fracture 20 (3.1%), pelvic injury 12 (1.8%) and traumatic amputation/crush injury 13 (2%). Soft tissue injuries include 70 (10.8%), tendon injury 56 (8.6%), lacerated wound 40 (6.2%), blood vessel injury 27 (4.2%) and nerve injury 25 (3.8%). Injury was significantly associated with injury site ($p=0.00$), occupation (0.000), smoking ($p=0.00$), injury site (0.000), associated injuries ($p=0.000$) and time to reach hospital ($p=0.000$)

Conclusion: Significantly high musculoskeletal injuries were found in CMH, Muzaffarabad. Lower limb is most common site of injury following upper limb and Ankle. Study recommend active registry of musculoskeletal injuries is need of time for proper management and development of treatment guidelines

Keywords: Musculoskeletal injury, lower limb injury, traumatic amputation/crush injury, pelvic injury, knee joint

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Introduction:

Trauma is leading cause of mortality and morbidity, worldwide. Most common cause of trauma is road traffic accidents following height falls, occupational injuries and different types of assaults.¹ An estimated projection of deaths due to injuries and trauma are 8.4 million per year.²

According to world health organization (WHO) findings road traffic accidents are responsible for more than 50-million injuries and 1.2-million deaths in 2004 annually, worldwide.³ An estimated 60-million individuals will be injured and more than 6-million will undergo mortality in next 10-years, reported by WHO in 2001.⁴

Musculo-skeletal injuries are most common cause morbidity. These musculo-skeletal injuries are associated with lost training time and reduced operational readiness in United States.⁵ Musculo-skeletal are common among military recruit individuals due to excessive physical training volume and intensity.⁶ Musculo-skeletal injuries are significant threat to physical integrity of individual and health of sportsman. Most common injuries include lower limb following knee joint injuries, lower vertebral column injuries, ankle and leg injuries.⁷

Musculo-skeletal injuries are more frequent to occur among young adults and individual with poor training. These injuries are responsible for high economic burden on health system.⁸ Prevalence of musculo-skeletal injuries was 63% in Brazil with majority of patients suffering with knee pain (55.4%).⁹ Literature reported that risk of musculo-skeletal injuries is associated with increase physical activity. Fractures and joint disorders are responsible for long term nursing care.¹⁰

Musculo-skeletal injuries usually affect bones, joints, tendons, ligaments and muscles due to excessive mechanical overload. Potential tissue overload is associated with torque and intensity of forces acting on body inside. Duration of exposure is also an important component for development of musculo-skeletal disorder. Duration of exposure is determined by number of repetitions per unit time and total exposure time. Body posture acts as significant factor in musculo-skeletal injuries development. Evidence exist that increased twisting or bending leads the individual to lower back pain occurrence.¹¹

Chalya et al. reported that lower limb fractures are result of large proportion of road traffic accident.¹² According to KCMC (Kilimanjaro Christian medical center), open fractures of tibia, fibula and femur are most common fractures with poor prognosis while open lower limb fractures are major cause of mortality in orthopedic department of hospital.¹³ Balcom et al reported

that soft tissue injuries occur as intermediate incidence and accounts for lowest morbidity. These injuries include laceration(18.4%), contusion(12.1%) and abrasion(11.9%).¹⁴

Main factors responsible for musculo-skeletal injuries include exertion of high intensity forces (leading to acute overloading of tissue), handling heavy loads over long periods (leading to degenerative diseases of lumbar spine), frequent repeated manipulation of objects (resulting in fatigue and muscular structure overload), static muscular load, muscular inactivity (loss of functional capacity of muscles), mono-tonous repetitive manipulations (resulting in us specific upper extremity compliant) and psychological factors (augmentation of physical strain).¹⁵ Data available on musculo-skeletal injuries is not enough to make any conclusion. So, present study aims to determine frequency patterns of musculo-skeletal injuries and its associated risk factors in CMH Muzaffarabad, Azad Kashmir.

Material and Methods:

A retrospective study was conducted at department of orthopedics, CMH Muzaffarabad. Data of 650-patients with musculo-skeletal injuries from January 2018-December 2018 was reviewed. Patients with age 20-65 years, both gender, musculo-skeletal injuries, Gustilo Anderson's (GA) grade I-III injuries were included in study. Exclusion criteria were based upon injuries other than musculo-skeletal, cardiovascular disorders, respiratory disorders, diabetics, hypertensive and other congenital disorders.

Research approval was taken from research committee of hospital. Consent forms were taken. Data for injury, mechanism of injury, injury site, type of treatment, recurring injury, existence of previous injury and time loss was reviewed. Data was analyzed using SPSS version 24. Mean and standard deviation was calculated for numerical data while categorical data was presented in terms of frequency and percentages. Effect modifiers (age and gender) were controlled by stratification. Post-stratification chi-square test was applied in study. We consider results ≤ 0.05

Table 1: Association between Injury, gender, age, smoking and occupation

Gender	Injury		Total	P value
	Bony injury	Soft tissue Injury		
Male	186(28.6%)	105(16.2%)	291(44.8%)	0.242
Female	246(26.5%)	113(17.4%)	359(55.2%)	
Age				
20-45 years	364(56%)	182(28%)	546(84%)	0.821
46-65 years	68(10.5%)	36(5.5%)	104(16%)	
Smoking				
Non smokers	291(44.8%)	115(17.7%)	406(62.5%)	0.00
Smokers	141(21.7%)	103(15.8%)	244(37.5%)	
Occupation				
Military servants	180(27.7%)	66(10.2%)	246(37.8%)	0.000
Public servants	96(14.8%)	22(3.4%)	118(18.2%)	
Private jobs	93(14.3%)	47(7.2%)	140(21.5%)	
Others	63(9.7%)	83(12.8%)	146(22.5%)	
Total	432(66.5%)	218(33.5%)	650(100%)	

Table 2: Association between Injury, injury site, GA grading and mechanism of injury

Injury site	Injury		Total	P value
	Bony injury	Soft tissue Injury		
Spine	28(4.3%)	28(4.3%)	56(8.6%)	0.000
Upper limbs	63(9.7%)	77(11.8%)	140(21.5%)	
Lower limb	249(38.3%)	81(12.5%)	330(50.8%)	
Ankle	62(9.5%)	8(1.2%)	70(10.8%)	
Knee	30(4.6%)	24(3.7%)	54(8.3%)	
Associated injuries				
Head injury	202(31.3%)	97(14.9%)	299(46%)	0.000
Thoracic injury	76(11.7%)	90(13.8%)	166(25.5%)	
Pelvis injury	105(16.2%)	31(4.8%)	136(20.9%)	
Abdominal injury	49(7.5%)	0(0%)	49(7.5%)	
Time to reach hospital				
<24 hours	193(29.7%)	105(16.2%)	298(45.8%)	0.000
24-72 years	193(29.7%)	65(10%)	258(39.7%)	
>72 years	46(7.1%)	48(7.4%)	94(14.5%)	
Total	432(66.5%)	218(33.5%)	650(100%)	

as statistically significant.

Results:

Total 650-patients were included in our study. There were 291(44.8%) male and 359(55.2%) female. Mean age of patients was 36.1±9.2SD. There were 546(84%) patients in age group 20-45 years and 104(16%) patients in age group 46-65 years. Among all the patients 650(100%), 406(62.5%) were non-smokers and 244(37.5%)

were smokers. Occupation was military in 246(37.8%) patients, 118(18.2%) were public servants, 140(21.5%) had private jobs and 146(22.5%) had other occupations. Among all the patients 650(100%), 432(66.5%) had bony injury and 218(33.5%) had soft tissue injury. Injury site was spine in 56(8.6%), upper limb 140(21.5%), lower limb in 330(50.8%), ankle 70(10.8%) and knee in 54(8.3%). Out of all lower limb injuries, 214(32.9%) were tibia/fibula fractures and 116(17.8%) were femur fractures. Out of all upper limb injuries, 35(5.4%) were dislocation, clavicle fractures in 32(4.9%), fracture dislocation 28(4.3%), spine fracture 20(3.1%), pelvic injury 12(1.8%) and traumatic amputation/crush injury 13(2%). Soft tissue injuries include 70(10.8%), tendon injury 56(8.6%), lacerated wound 40(6.2%), blood vessel injury 27(4.2%) and nerve injury 25(3.8%). Out of all bone fractures, 211(32.5%) were single bone fractures, two bone fractures 150(23.1%) and multiple bone fractures 71(10.9%). There were 265(40.8%) closed fractures and 167(25.7%) were compound fractures.

Mechanism of injury was running in 219(33.7%), trauma in 158(24.3%), sports in 102(15.7%), overload in 117(18%) and no reason in 54(8.3%) patients. Inflammation was tendiopathy in 149(22.9%), Hoffa’s fat pad inflammation 108(16.6%), cistus 116(17.8%), costochondritis 93(14.3%), periostitis 68(10.5%), ligament injury in 68(10.4%) and others 48(7.4%). Gustilo Anderson’s grade-I was seen in 237(36.5%), grade-II 269(41.4%) and grade-III in 144(22.2%) patients. Associated injuries were head injury 299(46%), thoracic injury 166(25.5%), pelvis injury 136(20.9%) and abdominal injuries 49(7.5%). Time to reach hospital was ≤24 hours 298(45.8%), 24-72 hours in 258(39.7%) and >72 hours in 94(14.5%).

Among all the males 291(44.8%), 186(28.6%) had bony injury and 105(16.2%) had soft tissue injury. Among all the females 359(55.2%), 246(26.5%) had bony injury and 113(17.4%) had soft tissue injury (p=0.242). Among all the

patients who were non smokers 406(62.5%), 291(44.8%) had bony injury and 115(17.7%) had soft tissue injury. Among all the smokers 244(37.5%), 141(21.7%) had bony injury while 103(15.8%) had soft tissue injury ($p=0.00$). Occupation is significantly associated with injury ($p=0.000$) while age is insignificantly associated with injury ($p=0.821$) as shown in table-1.

Injury site was significantly associated with bony and soft tissue injury ($p=0.000$). Among all the patients with head injuries, 202(31.3%) had bony injuries and 97(14.9%) soft tissue injury. Among all the patients thoracic injuries, 76(11.7%) had bony and 90(13.8%) had soft tissue injury. Among all the patients with pelvis injuries, 105(16.2%) had bony and 31(4.8%) had soft tissue injury. Among all the patients with abdominal injuries, 49(7.5%) had bony injuries and 0(0%) had soft tissue injury ($p=0.000$). Among all the patients who reach hospital <24 hours, 193(29.7%) had bony and 105(16.2%) had soft tissue injury. Among all the patients who reach within 24-72 hours after injury to hospital, 193(29.7%) had bony and 65(10%) had soft tissue injury. Among all the patients who reach hospital >72 hours, 46(7.1%) had bony and 48(7.4%) had soft tissue injury as shown in table-2.

Discussion:

According to World Health Organization (WHO) and bone joint decade report, limb trauma is most common musculo-skeletal disorder associated with economic and health care burden at the start of new millennium in developed and developing countries.¹⁶

In present study, 432(66.5%) had bony injury and 218(33.5%) had soft tissue injury. Gopinathan et al. reported that soft tissue injuries cover whole body including head and neck, thigh, wrist, arm, foot and upper back (5/28, 3/28, 1/28, 2/28, 2/28, 1/28 respectively). These injuries may include minor abrasions, skin wounds and superficial bruises depending upon mechanism of injury.¹⁷ Sural et al reported that closed fractures accounts for 58% and open frac-

tures accounts for 6% of bony fractures.¹⁸

In present study, injury site was spine in 56(8.6%), upper limb 140(21.5%), lower limb in 330(50.8%), ankle 70(10.8%) and knee in 54(8.3%). Foote et al. reported that pattern of musculo-skeletal injuries include upper limb injuries 53%, lower limb injuries 33%, head and neck injury 5%, chest injury 9%, femur shaft fractures 18.75%, clavicle fractures 12.5%, supracondylar fractures of humerus 10.94% and forearm bones 14.06%.¹⁹ Cronholm et al. reported that lower limb injuries are common musculoskeletal injuries with dislocation and amputation (33%, 10%, 5%).²⁰

In present study, mechanism of injury was running in 219(33.7%), trauma in 158(24.3%), sports in 102(15.7%), overload in 117(18%) and no reason in 54(8.3%) patients. Heinrich et al. reported that musculo-skeletal injuries are common in sports-man due to strenuous exercises (34%).²¹ Brushoj et al. reported that overloading and trauma in old age leads to serious musculoskeletal injuries. Moreover, overloading is associated with knee injuries (13%).²² Another similar study reported that running is 2nd most serious cause of musculo-skeletal injuries (18.8%). However, increasing frequency of running is positively correlated with physical condition damage ($p=0.00$).²³

In present study, injury site, smoking and occupation were significantly associated with injuries. Coppack et al. reported that musculoskeletal injuries are most common among males as compared to female ($p=0.02$).²⁴ Olsen et al. reported that military persons are more prone to be affected with musculo-skeletal injuries as compared to other occupations ($p=0.01$).²⁵ Lephart et al. reported that there is no significant association between musculo-skeletal injuries and smokers or drug abusers ($p>0.05$).²⁶ Limitation: Conduction of study at CMH Muzaffarabad over estimates military individuals with musculo-skeletal injuries. This condition limits generalisability of study.

Conclusion:

Significantly high musculoskeletal injuries were found in Combined Military Hospital (CMH), Muzaffarabad. Lower limb is most common site of injury following upper limb and ankle. Study recommend active registry of musculo-skeletal injuries is need of time for proper management and development of treatment guidelines.

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Dr Shaukat Hayat Khan, Data collection and analysis

Dr Muhammad Shahbaz Raza, study designing

Dr Iffat Ara, carryout the study and did initial write up

Dr Rehan Wani, Data coding and interpretation

Dr Khalid Mehmood, Data acquisition

Dr Ishtiaq Anwar, Critical review the article and made final changes

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