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Original Research Article

Characteristics of femur fracture patients at Sanjiwani general hospital Gianyar in 2019

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ABSTRACT

Background: Fracture is a discontinuity of bone which is often followed by damage to the surrounding soft tissue, such as blood vessels, muscles, and nerves. World health organization (WHO) stated that there are 5.6 million people died due to fractures and 1.3 million people suffering fractures due to traffic accidents in 2011-2012. One of the most common fractures on lower extremities due to severe trauma is femur fracture. Femur fracture is usually caused by trauma due to pressure that exceeds the capacity of the femur. Femur fracture today is still common and remains one of the major challenges for orthopaedists. Although management in orthopaedic had been growing rapidly, the one-year mortality rate post-trauma is still high, about 10-20%. This study aims to determine the characteristic of femur fracture patients at Sanjiwani hospital Gianyar in 2019.
Methods: This study is a retrospective descriptive study that aims to identify the characteristic of femur fracture patients at Sanjiwani hospital Gianyar in 2019. The samples of this study were collected using total sampling technique. The data was obtained from medical record of patients diagnosed with femur fracture at Sanjiwani hospital Gianyar during January-December 2019. Variables in this study including age, sex, cause of femur fractures, type of fractures, and location of the fractures. All obtained data will be analysed using SPSS statistics 22 software.
Results The result of this study showed that most of samples are male with 26 peoples (61.9%) and age group is 21-30 years old is the most common age group with 11 peoples (26.2%). Close fracture is the most common fracture type with 38 peoples (90.5%) and located in the middle shaft of femur with 20 peoples (47.6%).
Conclusions: In conclusion, the most common characteristic of femur fracture patients at Sanjiwani hospital Gianyar in 2019 is male, age 21-30 years old, closed fracture and located in the middle shaft of the femur.

Keywords: Characteristics, Femur fracture, Trauma

INTRODUCTION

Bone is the structure and supports of the human body.[1,2] Bone function to support the body, protect other organs, allowing movement of the body, and storage minerals.[3] However, these functions might be disrupted by trauma due to collisions or accidents that cause bone fractures. Fracture is a discontinuity of the bone which is often followed by soft tissue damage, such as blood vessels, muscles, and nerves.[1-3]

Femur fracture is one of the most common fractures in lower extremities caused by severe trauma.[4] Femur fractures usually cause by trauma, causing a pressure that exceeds the capacity of the femur.[5] Based on epidemiology, fracture more often occurs in males than females with a ratio of 3:1.[5,9] WHO stated that there are 5.6 million peoples died due to fracture and 1.3 million peoples suffering a fracture due to traffic accidents in 2011-2012.[7,8] The worldwide incidence of fracture of shaft femur is about 9.5 until 18.9 per 100.000 every year. Distal femur fracture accounts for about 4-6% of all femur fractures cases.[7] Fracture in lower extremities due

to accidents has the highest prevalence among other fractures with 46.2% in Indonesia. As a result of accidents, 19.629 out of 45.987 peoples with lower extremities fractures had femur fracture.[7,8] Most of fracture cases occur in young people under 40 years old and elderly people. High energy trauma is more common at young age. The incidence of femur fractures increases with ole age which is usually caused by low energy trauma with about 65% cases.[9] Until now, femur fractures cases are still common and remained one of many challenges in orthopaedic fields. Even though management in orthopaedic fields has improved, the post-traumatic one-year mortality rate remains high, which is about 10-20%.[7,9] This high mortality rate after femur fracture increases the need to develop more adequate fracture management. Management of femur fracture must be done quickly and precisely. If management becomes too late, the blood supply to the femur's head will be disrupted which is also increases the risk of avascular necrosis.[1]

Femur fracture is commonly found during accidents and emergency cases.[8] The femur is the longest bone in the human body. The femur has some parts which are consist of a head, neck, greater and lesser trochanter, shaft, and the distal condyle. Fractures can occur in any of those femur's parts. As the strongest, biggest, and heaviest bone in the human body, a high energy trauma is needed to cause femur fracture. However, femur fracture without high energy trauma can also be found in certain pathological condition that affects bone density, such as osteopenia or osteoporosis.[3,11] These conditions commonly found in women who already had menopause.[3]

Based on those facts, there just are a few studies that explain the characteristic of femur fractures cases in Bali. Therefore, this study aims to identify the characteristic of femur fracture patients, including age, sex, cause of femur fractures, type of fractures, and location of the fractures at Sanjiwani hospital Gianyar, Bali.

METHODS

This study is a retrospective descriptive study that aims to identify the characteristic of femur fracture patients at Sanjiwani hospital Gianyar in 2019. The samples of this study were collected using total sampling technique. The data was obtained from medical record of patients diagnosed with femur fracture at Sanjiwani hospital Gianyar during January-December 2019. Therefore, forty-two eligible samples are obtained. Variables in this study including age, sex, cause of femur fractures, type of fractures, and location of the fractures. All obtained data will be analysed using SPSS Statistics 22 software.

RESULTS

This study included 42 samples with femur fractures. The samples are described based on their age, sex, cause of fractures, type of fractures, and femur fracture locations.

Table 1. Characteristics of femur fracture patients.

Characteristics	Frequency (n=42)	Proportion (%)
Sex		
Male	26	61.9
Female	16	38.1
Age (year)		
0-10	2	4.8
11-20	7	16.7
21-30	11	26.2
31-40	7	16.7
41-50	4	9.5
51-60	6	14.3
>60	5	11.9
Cause of fracture		
Traffic accident	33	78.6
Fall	9	21.4
Type of fracture		
Closed fracture	38	90.5
Open fracture	4	9.5
Location of fracture		
Proximal	8	19
Middle	20	47.6
Distal	14	33.4

Source: Sanjiwani Gianyar general hospital medical record in 2019.

Table 2: Cross table between the group of age with the cause of femur fractures at Sanjiwani Gianyar general hospital in 2019.

Age (year)	Cause of fracture	
	Traffic accident N (%)	**Fall N (%)**
0-10	0	2 (100)
11-20	6 (85.7)	1 (14.3)
21-30	11 (100)	0
31-40	6 (85.7)	1 (14.3)
41-50	4 (100)	0
51-60	3 (50)	3 (50)
>60	3 (60)	2 (40)
Total	33 (78.6)	9 (21.4)

Based on Table 1, most of the samples were male with 26 samples (61.9%) and the female were as much as 16 samples (36.1%). Based on the age group, the 21-30 years old group has highest number of femur fractures (26.2%) with 11 samples, while the 0-10 years old group has the least number of fracture cases (4.8%) with 2 samples. As much as 33 samples of the femur fracture cases were caused by traffic accidents (78.6%). From table 2, all the femur fractures with as much as 11 cases in the 21-30 years old group are caused by traffic accidents (100%). Based on the type of fractures, almost all the samples (90.5%) had closed fractures while 4 people (9.5%) had open fractures. Based on the data, 8 people had proximal femur fractures (19%), 20 people had middle femur fractures (47.6%), and 14 people had distal femur fractures (33.4%).

DISCUSSION

In this study, 42 cases of femur fracture were identified at Sanjiwani hospital Gianyar from January to December 2019. Most of the sample were male 61.9% while the others were female 38.1%. The result shows that femur fracture was more common in males than females. This result is similar to the study by Obaidur et al in Pakistan in 2013 which reported that most femur fracture patients from traffic accidents are male (63.8%).[13] The result is supported by research conducted by Salmien at Helsinski university central hospital in 2005 which reported, the incidence in a male group was 191 per 100.000 inhabitants.[18] Another studies from Noorisa et al at Dr. Soetomo general hospital Surabaya in 2013-2016, the result was male-dominated with 81 cases (72%).[19] The higher number of cases in male happens because men are more active outside the house such as working, exercising, moreover most men tend to drive faster on the road.[13,14]

Based on the age, femur fractures are mostly found in the 21-30 years old age group as many as 11 samples (26.2%), while the cause of femur fractures was mostly due to traffic accidents, namely 33 people (78.6%). The cross-tabulation between the age with the cause of fracture in table 2 shows that all the 21-30 years old age samples had traffic accidents. Patients between 18-30 years old experienced most fractures due to traffic accidents since they are in the productive age and most of them have high mobility in outdoor activities.[14] The result is supported by research conducted by Desiartama et al at Sanglah general hospital in 2013 which reported that in 2013, there were 113 samples of adult patients with femur fractures caused by traffic accidents and the mostly happen between 18-30 years old age group (56.6%).[15] The result also supported by research from Al Turki et al at national guard hospital Saudi Arabia which reported that, femur fractures mostly happen between 16-30 years old age group with 263 cases (56%).[20] Several studies also have examined the incidence of femoral fractures are common in adult with incidence up to 37 per 100.000 patients.[18]

The types of femur fractures found in this study were mostly closed fractures with 38 samples (90.5%), while the open fractures were found in 4 people (9.5%). The result is supported by research conducted by Noorisa et al at Dr. Soetomo general hospital Surabaya in year of 2013 until 2016, the most type of fracture is close fracture with a prevalence of 80 cases (71%).[19] This happens because the femur is covered and attached to strong and thick muscles such as quadriceps femoris muscle, pectineus muscle, short adductor muscle, adductor magnus muscle, adductor longus muscle, gluteus maximus muscle, thus open fractures are rarely found.[16]

Based on the locations, most of the fractures are located in the middle part with as many as 20 samples (47.6%). The result is in accordance with the study conducted by Andriandi at Haji Adam Malik hospital Medan in 2010 which showed that as many as 135 people (54.7%) had femur fractures on the middle or the shaft area because of the trauma mechanism in those areas are the most frequently found.[17] This is supported by the study conducted by Salmien et al in 2000, where femur fractures located in the middle or diaphysis are found in 79% of cases. In Riyadh, Kingdom of Saudi Arabia at national guard hospital between 2007-2013, there was studies which reported that the femoral shaft is the most common fracture with 303 cases (64%).[20] This may occur because the central area experiences high pressure and high energy from traumas, therefore those areas are more vulnerable to fractures.[16] The result is supported by research conducted by Salmien at Helsinski university central hospital in 2005 which reported that, there were 50 patients with femur fractures located in shaft femur or diaphysis due to low energy injury and the incidence was 2.5 per 100.000 person-years.[18]

Limitations

The limitations of this research are that only a small number of variables studied, thus the data coverage is not yet broad and deep. Further studies regarding femur fractures are necessary to identify the risk factors of femur fractures incidents.

CONCLUSION

To summarize, the characteristics of femur fractures patients in Sanjiwani Gianyar regional public hospital from January-December 2019 were as follow: there were 42 samples, most of the samples were male (61.9%), the samples were mostly 21-30 years old (26.2%), the fractures are mostly caused by traffic accidents (78.6%), almost all the fractures are closed fractures (90.5%), and they are mostly located in the middle area (47.6%). The cross-table between age and the cause of femur fractures shows that all the femur fracture cases in the 21 – 30 years old group are caused by traffic accidents (100%).

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