



Mortality Rate of Older Patients with Lower Body Fractures: A Follow-up Study

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Dear Editor-in-Chief

Lower body fractures that involved body parts lower than the hip are associated with notable morbidity and mortality in an older population (1,2). Previous studies were mainly focused on hip fractures in assessing mortality rate (3).

Therefore, we aimed to determine the number and percentage of mortality rate among patients aged 50 yr and above with lower body fractures after 3 months of hospital discharge. Additionally, this study was also intended to determine the factors of mortality rate based on independent variables such as age, gender and types of fracture. Two hospitals in Klang Valley, Malaysia were involved in this study; Hospital Canselor Tuanku Muhriz (HCTM) and Hospital Kuala Lumpur (HKL), from 2014 to 2016.

Patients admitted due to lower limb fractures (hip, femur, tibia, fibula, knee, ankle and foot) were included. The patients were contacted for a follow-up visit after three months of hospital discharge. Mortality-related information was recorded using the provided form. Descriptive analysis was conducted to determine the frequency and the percentage of mortality rate. Logistic regression tests were performed to define the determinant factors of mortality with the independent

variables. Receiver operating characteristic (ROC) test was performed to determine the stability of the resulting logistic regression model. The value of area under the curve (AUC) was referred to determine the strength of a model.

Ethical

approval was obtained from Universiti Kebangsaan Malaysia Ethical Committee (UKM 1.5.3.5/244/FF-2014-29/Prof Dr Ahmad Nazrun Shuid) and the Research Committee Kuala Lumpur Hospital (IRC-IIR/2014/011/156).

In this study, 129 patients were recruited at the ward admission phase, and the numbers had dropped to 118 patients at the mortality follow-up phase. Fourteen (11.9%) out of 118 patients were reported dead within three months after the hospital discharge. The number and percentage of deceased patients were detailed for three independent variables; age, gender and types of fracture. Patients aged above 84 yr old had the highest mortality rate with 6 patients died (37.5%), the second highest mortality rate was the age group of 75 to 84 yr old with 5 patients died (12.2%) and patients in the age group 65 to 74 yr old showed only 3 patients died (11.5%). There



was no death recorded for the 50 to 64 age group patients. In terms of gender, male patients reported 6 deaths (13.6%), while female patients reported 8 deaths (10.8%). Patients who suffered from hip fractures had higher frequency and percentage of mortality with 11 subjects died (15.9%), while patients with non-hip lower limb fracture showed only 3 deaths (6.1%).

These results were in line with several previous studies (4,5). From the logistic regression model, only age ($P=0.002$) showed significant value while two other factors; gender ($P=0.277$) and types of fracture ($P=0.430$) did not show any significant value. The age factor showed an odds

ratio (OR) of 1.172, which meant that by controlling other factors in the model, an increased age by one year may increase the probability of death by 1.17 times after three months of hospital discharge. These results were supported by several previous studies that old age had significant relationship with mortality rate (6,7). Details of the logistic regression for the determinant factor of mortality rates were tabulated in Table 1. The strength of regression model tested using ROC analysis test showed AUC of 79.9%. Figure 1 shows the ROC curve with the AUC value for the mortality determinant model.

Table 1: Logistic regression for determinant factor for mortality rate

<i>Determinant Factors</i>	<i>Logistic regression</i>		
	<i>95% CI</i>	<i>Odd ratio (OR)</i>	<i>P-value</i>
Age (yr)	1.062 to 1.293	1.172	0.002
Gender			
Male	0.141 to 1.754	0.497	0.277
Female (R)			
Types of fracture			
Hip fracture	0.089 to 2.803	0.499	0.430
Non-hip fracture (R)			

R = reference variable

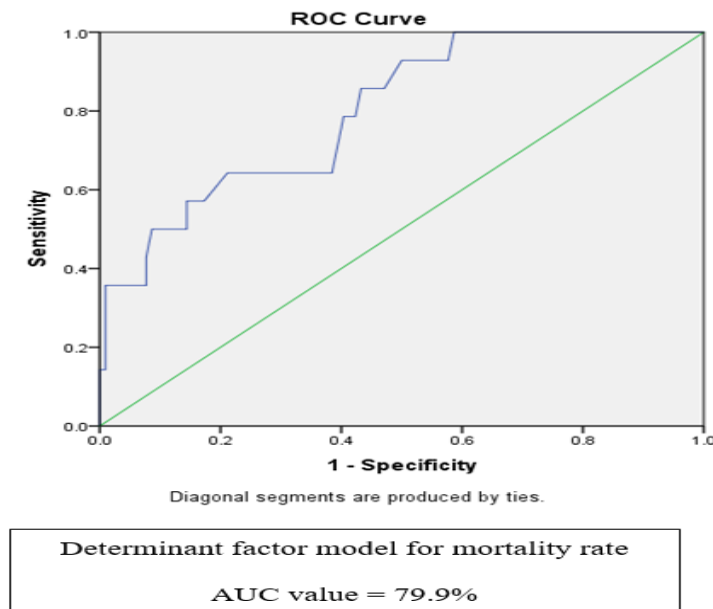


Fig. 1: ROC curve with the AUC value for the mortality determinant model

The limitation of our study was that our population was not large enough to represent the whole country. It could however represent the Klang Valley population, as the two hospitals used were tertiary hospitals with many admissions of fracture cases. Apart from that, the mortality rate was only determined within 3 months after hospital discharge. Further extension of the study is required to follow-up the patients for a few yr to look at the pattern of mortality rates. The mortality rate for older patients with lower limb fractures at 3 months after hospital discharge was about 12%. Age was the determinant factor for the mortality rate.

Conflicts of interest

The authors declare that there is no conflict of interest.

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