Case-control investigation on the risk factors of melioidosis in small ruminant farms in Peninsular Malaysia

ABSTRACT

Aims: Epidemiology of melioidosis is poorly understood because its occurrence is influenced by complex interaction of environmental, climatic, physicochemical and host factors. We investigated the potential risk factors for the exposure to Burkholderia pseudomallei in small ruminants' farms in Peninsular Malaysia. Methods and results: Melioidosis-positive (n = 33) and negative (n = 27) farms were selected and visited for interviews and environmental samples collection. The characteristics and putative disease risk factors were compared between the case and the control farms using Chi-square test and logistic regression analysis. The multivariable logistic regression analysis showed that the odds of melioidosis were significantly higher in farms that had bush clearing around farms (odds ratio (OR) = 6.61, 95% confidence interval (CI) = 1.12-38.84, P = 0.037), in farms with B. pseudomallei present in the soil (OR = 6.23, 95% CI = 1.03-37.68, P = 0.046), in farms that have other animal species present (OR = 7.96, 95% CI = 1.14-55.99, P = 0.037) and in farms that had flooding or waterlogging conditions (OR = 11.95, 95% CI = 1.39-102.6, P = 0.024) when compared to the odds of the disease in farms that did not have the above conditions. The odds of the disease in farms that treated their soils with lime were significantly lower (OR = 0.028, 95% CI = 0.003-0.29, P = 0.003) compared to the odds in those that did not. Conclusions: The risk factors for the exposure to B. pseudomallei highlighted above may have contributed to the occurrence of melioidosis in animals in the study farms. Significance and impact of the study: Information from the study may be helpful in planning control measures against melioidosis and have improved understanding of the epidemiology of the disease in livestock farms.

Keyword: Burkholderia pseudomallei; Melioidosis; Risk factor; Seroprevalence; Small ruminants