Alarm threshold levels of meningitis outbreak in Hamadan province (2010-2012)

Background: The surveillance systems need to define the levels of alarm threshold for early detection of outbreak. The purpose of this study was to determine the threshold levels of meningitis outbreak in Hamadan province, Iran.

Methods: The suspected cases of meningitis that were reported through meningitis surveillance form 2010 to 2012 were investigated in this study. Explainable patterns of the syndromic data of fever and neurological symptoms were removed by Generalized Linear Model. The upper limits of cumulative sum (CUSUM) algorithm were used to estimate the alarm threshold levels of meningitis outbreak. The seasonal pattern of dynamic alarm thresholds was defined using the data obtained from different seasons.

Results: The fixed alarm threshold levels according to standardized CUSUM, i.e. 1.5 to 2 standard deviations from the mean, were equal to the occurrence of more than 3 and 4 suspected cases of meningitis, respectively. The corresponding values for dynamic levels based on the upper control limit of CUSUM were 2.6 to 3.2 cases for different seasons. In other words, 3 cases were considered to be a discrete scale for suspected cases of meningitis.

Conclusion: Due to the seasonality pattern of meningitis, dynamic levels of alarm threshold should be determined according to the seasons and months of year.

Keywords: Meningitis, outbreak, surveillance system, CUSUM

References