

The Epidemiology of Dengue in Taiwan during 2014-15: A Descriptive Analysis of the Severe Outbreaks of Central Surveillance System Data

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Abstract : Dengue is a major public health concern throughout tropical and sub-tropical regions. Taiwan is located in the Pacific Ocean and overlying the tropical and subtropical zones. The island remains humid throughout the year and receives abundant rainfall, and the temperature is very hot in summer at southern Taiwan. It is ideal for the growth of dengue vectors and would be increasing the risk on dengue outbreaks. During the first half of the 20th century, there were three island-wide dengue outbreaks (1915, 1931, and 1942). After almost forty years of dormancy, a DEN-2 outbreak occurred in Liuchiu Township, Pingtung County in 1981. Thereafter, more dengue outbreaks occurred with different scales in southern Taiwan. However, there were more than ten thousands of dengue cases in 2014 and in 2015. It did not only affect human health, but also caused widespread social disruption and economic losses. The study would like to reveal the epidemiology of dengue on Taiwan, especially the severe outbreak in 2015, and try to find the effective interventions in dengue control including dengue vaccine development for the elderly. **Methods:** The study applied the Notifiable Diseases Surveillance System database of the Taiwan Centers for Disease Control as data source. All cases were reported with the uniform case definition and confirmed by NS1 rapid diagnosis/laboratory diagnosis. **Results:** In 2014, Taiwan experienced a serious DEN-1 outbreak with 15,492 locally-acquired cases, including 136 cases of dengue hemorrhagic fever (DHF) which caused 21 deaths. However, a more serious DEN-2 outbreak occurred with 43,419 locally-acquired cases in 2015. The epidemic occurred mainly at Tainan City (22,760 cases) and Kaohsiung City (19,723 cases) in southern Taiwan. The age distribution for the cases were mainly adults. There were 228 deaths due to dengue infection, and the case fatality rate was 5.25 %. The average age of them was 73.66 years (range 29-96) and 86.84% of them were older than 60 years. Most of them were comorbidities. To review the clinical manifestations of the 228 death cases, 38.16% (N=87) of them were reported with warning signs, while 51.75% (N=118) were reported without warning signs. Among the 87 death cases reported to dengue with warning signs, 89.53% were diagnosed sever dengue and 84% needed the intensive care. **Conclusion:** The year 2015 was characterized by large dengue outbreaks worldwide. The risk of serious dengue outbreak may increase significantly in the future, and the elderly is the vulnerable group in Taiwan. However, a dengue vaccine has been licensed for use in people 9-45 years of age living in endemic settings at the end of 2015. In addition to carry out the research to find out new interventions in dengue control, developing the dengue vaccine for the elderly is very important to prevent severe dengue and deaths.

Keywords : case fatality rate, dengue, dengue vaccine, the elderly

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