Short Communication

Seasonal Influenza Surveillance Using Prescription Data for Anti-Influenza Medications

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SUMMARY: Surveillance is critical for both early detection and a timely public health response to infectious diseases. Electronic information systems have been widely adopted by pharmacies in Japan. The aim of this study is to evaluate the feasibility of using prescription data for influenza surveillance in Japan to facilitate the development of a daily reporting system. This is a retrospective study using questionnaires mailed to pharmacies in Sakai City, Osaka, Japan in October 2007. The total number of prescriptions for oseltamivir and zanamivir and the number of influenza cases reported by sentinel surveillance in Sakai during the investigation period showed excellent correlation, with a correlation coefficient of 0.954. Further analysis showed that the data from as few as eight pharmacies result in a correlation coefficient of 0.9. These results demonstrate the feasibility of such a system and that pharmacy prescription data are a very useful indicator of sentinel surveillance for influenza.

In Japan, the sentinel reporting of clinical cases of influenza-like illness is mandatory as part of the National Epidemiological Surveillance of Infectious Diseases (NESID); the data are officially published 2 weeks later (1). Oseltamivir and zanamivir are approved for influenza A and B, and amantadine is approved for influenza A. The prescription rate for these medications was estimated at approximately 60-80% in 2004/2005 and 2005/2006 (2-4). Approximately 60% of outpatients receive prescribed medications at pharmacies outside of hospitals or clinics in Japan (5). Many pharmacies convert prescriptions to electronic data to calculate medical bills and for daily inventory control. If these data can be used for influenza surveillance, a daily reporting system would be possible. The objective of this study is to evaluate the possibility of performing influenza surveillance using prescription data for oseltamivir and zanamivir. We investigated the acceptance of this method by pharmacies and also determined the feasibility of designing a surveillance system using available data.

This is a retrospective study using questionnaires mailed to all pharmacies in Sakai City, Osaka, Japan on 15 October 2007. The questionnaires evaluated the capacity of the pharmacies, including the total number of prescriptions received per day, the existence of an internet-based system and the use of an electronic billing system. The number of prescriptions filled for oseltamivir and zanamivir per week between 4 December 2006 and 29 April 2007 was requested. We excluded amantadine from this study because of the difficulty of distinguishing its use for Parkinsonism from its use for influenza A based on prescription data.

The number of prescriptions for oseltamivir and zanamivir was compared with the number of influenza cases reported to the sentinel surveillance system in Sakai during the investiga-

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This study demonstrates the feasibility of such a system and that prescription data can be a useful indicator for seasonal influenza surveillance. Most of the pharmacies that participated in this study access the internet and use a computerized medical billing system. Approximately 80% of the pharmacies processed oseltamivir or zanamivir prescriptions, which were distributed throughout the study area.

The results also show an excellent correlation with the number of influenza cases reported to the Health Department, so surveillance is likely to be sensitive and representative of influenza patients who seek medical care. Determining the number of pharmacies required to obtain useful surveillance data is an important consideration. Despite the varied size of the pharmacies in this study, we found that the minimum number of pharmacies needed to obtain a correlation greater than 0.9 with the number of influenza cases averaged eight, which represents about 3% of all pharmacies in the study area.

One limitation of the study is that we adopted the NESID data as the standard. We used the percentage of prescriptions based on the total number of prescriptions in Japan as the percentage of influenza medicine prescriptions for Sakai because there was no official information available. The response rate for the questionnaires was only 57.9% in spite of a reminder letter sent by the Sakai City Pharmaceutical Association. We have no information about pharmacies that did not respond to the survey. The usual treatment course with oseltamivir or zanamivir for influenza is 5 days, and we assumed that the number of prescriptions was equal to the number of cases. In January 2009, the National Institute of Infectious Diseases (NIID) reported that more than 98% of tested H1N1 influenza virus was resistant to oseltamivir (8). The number of prescriptions of oseltamivir might be influenced by such an environmental change. These limitations will be addressed in future research on the development of a surveillance system.

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REFERENCES