Identifying a Meningitis Case through Syndromic Surveillance: An Example of Detecting Events of Public Health Importance and Improving Situational Awareness

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OBJECTIVE

The purpose of this paper is to describe the use of the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) and its ability to use hospital emergency room data for situational awareness.

BACKGROUND

Surveillance of syndromes at the pre-diagnostic level, instead of specific diagnoses reported after laboratory or other diagnostic procedures, may greatly lessen the time it takes to determine that an outbreak is occurring. While a goal of syndromic surveillance is early event detection, these data may be used to enhance traditional surveillance activities to increase situational awareness of individual events of public health importance. For example, surveillance of meningitis, particularly bacterial meningitis, is important due to its severity and rapidity of disease progression. Early detection of cases and chemoprophylaxis are keys of public health interventions for meningitis [1].

METHODS

The Electronic Surveillance System for the Early Notification of community-based Epidemics (ESSENCE) is a cross-jurisdictional electronic syndromic surveillance system which analyzes multiple traditional (such as emergency room visits, private provider visits) and non-traditional (such as over-the-counter drug sales, school absenteeism) surveillance data sources for purposes of detecting and tracking potential public health emergencies. The system is monitored daily at the Maryland Department of Health and Mental Hygiene (DHMH) and at partner jurisdictions for anomalies in syndrome counts, specific chief complaints through free text queries, and spatial clustering.

RESULTS

On a weekend day in March 2006, ESSENCE identified a neurological syndrome anomaly for the Maryland region: ESSENCE data revealed 18 coded visits associated with neurological disease compared to 5.679 expected visits. Further assessment of details identified 9 visits (all residents of the same county), who received meningococcal meningitis prophylaxis at Hospital A. The case patient was seen at the ED of Hospital A on the previous day, and subsequently admitted. Testing at the state reference laboratory ultimately confirmed *N. meningitidis*, serogroup Y by culture, however, even before culture confirmation, Hospital A provided chemoprophylaxis to 9 appropriate close household contacts (the same 9 visits recognized through review of syndromic surveillance data). Although any suspected case of meningococcal meningitis is required by the Code of Maryland, Annotated Regulations (COMAR) to immediately be reported via phone to the appropriate county health department, there were no such notifications from the hospital to the local or state health departments. While no additional close contacts requiring chemoprophylaxis were ultimately identified, the recognition of the case patient by public health was initially accomplished through an electronic syndromic surveillance system, not by traditional surveillance.

CONCLUSIONS AND RECOMMENDATIONS

A recognized limitation for the use of electronic syndromic surveillance systems is the need for frequent monitoring and review of data in order to detect events early. This specific event did reveal:

- The need for standardized protocols for response to syndromic surveillance data that should be disseminated to local level
- The need for reinforce reporting mechanisms for infectious diseases of public health significance from provider, to local, to state level
- That electronic syndromic surveillance systems may provide, on a very granular level, additional patient details to make decisions about further epidemiologic investigations

As a tool for situational awareness, ESSENCE may be a useful in detecting cases of public health significance, not instead of traditional surveillance systems, but rather, by augmenting existing systems to decrease time to intervention and enhance response measures.

REFERENCES

[1] CDC. Control and prevention of meningococcal disease and Control and prevention of serogroup C meningococcal disease: evaluation and management of suspected outbreaks. MMWR 1997; 46(No. RR-5).

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