Chart review of laboratory-confirmed *Salmonella* Enteritidis cases in a local food borne outbreak linked to mung bean sprouts

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OBJECTIVE

A retrospective chart review was performed to examine chief complaint, syndrome classification and discharge diagnoses of laboratory confirmed *Salmonella* Enteritidis phage type (PT) 13 cases who visited the Emergency Departments (ED) of two local hospitals during a province-wide outbreak in Ontario in the fall of 2005. This assessment was used to assess the sensitivity of the ED syndromic surveillance system to detect a local foodborne outbreak, and to modify syndrome classification.

BACKGROUND

Kingston, Frontenac and Lennox & Addington (KFL&A) Public Health, located in Kingston, Ontario has been conducting Emergency Department (ED) Syndromic Surveillance since August 2005 funded by the Ontario Ministry of Health and Long-Term Care Public Health Division. The RODS-based system captures real-time ED visits from 7 area hospitals and real-time admissions from 3 area hospitals. The primary goal of the system is to provide early warning of gastrointestinal (GI) or respiratory outbreaks.

In November 2005, a local outbreak of *S.* Enteritidis occurred in Kingston consistent with a province-wide outbreak associated with mung bean sprouts. *Salmonella* is reportable by law in Ontario under the Health Protection and Promotion Act (HPPA). Salmonellosis is commonly manifested by acute enterocolitis, with sudden onset of headache, abdominal pain, diarrhea, nausea and sometimes vomiting (*1*). Several ill persons visited the 2 Kingston EDs with chief complaints of diarrhea +/- other symptoms. Identification of this cluster and subsequent alerting to ED physicians led to identification of the cause of the provincial outbreak.

METHODS

Chart Review: All hospital charts were reviewed for laboratory confirmed cases of *S.* Enteritidis PT 13 who visited the ED at 2 local Kingston hospitals in November 2005. A comparison was made between the chief complaint, syndrome classification and discharge diagnosis. Public health laboratory confirmed cases were obtained from the integrated Public Health Information System (iPHIS) database.

Syndrome Definition & Anomaly Detection: The sensitivity of the ED syndromic surveillance system to detect a local foodborne outbreak using RODS GI syndrome classification was documented by the existing system. A modified GI syndrome was created to reflect gastroenteritis symptoms (diarrhea and/or vomiting). The CDC's EARS tool was used to test the sensitivity of the modified gastroenteritis or GI syndrome.

RESULTS

Of the 26 cases reported to public health in KFL&A, 10 patients visited the ED for medical assessment and two were hospitalized due to severity of illness. Nine out of ten cases (90%) were classified as Gastroenteritis syndrome. All the discharge diagnoses would be classified as GI using a free-text medical diagnosis classifier. The chief complaints and discharge diagnoses were as follows (Figure 1):

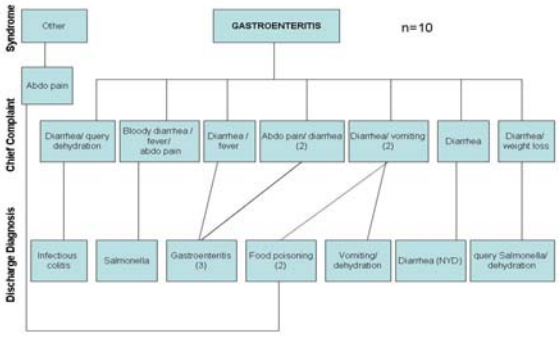

Figure 1 – *Salmonella* Enteritidis-confirmed cases associated with an outbreak who visited the ED of 2 local Kingston hospitals, Nov. 2005

The RODS GI syndrome correctly classified 9 out of 10 chief complaints, however the system did not alert due to a larger level of baseline 'noise' in the data eg. chief complaints of abdominal pain that may not be true gastroenteritis illness. The more specific modified gastroenteritis syndrome (diarrhea and/or vomiting +/- other symptoms) also classified 9/10 correctly using the EARS system, but as a result of the decreased level of 'noise' within the GI syndrome, an alert was triggered on the day the initial cluster of patients presented to the ED. Based on this finding and the emphasis on the mandate of local public health to detect infectious disease events or outbreaks, the syndrome classification was modified accordingly to reflect gastroenteritis-related events.

CONCLUSIONS

Although small numbers, the results of this chart review are encouraging and hold promise for the ability of an ED syndromic system to detect localized GI outbreaks. In a more severe GI outbreak such as this where a subset of patients require hospitalization, people are likely to seek medical attention at the ED (in this case slightly less than half). A more specific gastroenteritis syndrome definition resulted in less 'noise' and system alerts on the initial day patients presented to the ED thus supporting the need to modify syndromes to more effectively capture infectious disease events of interest to public health.

REFERENCES

[1] Heymann DL. Control of Communicable Diseases Manual 18th Edition. American Public Health Association. 2004.

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