

Evaluation of the Connecticut hospital emergency department syndromic surveillance system for monitoring of community gastrointestinal illness

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Objective

To evaluate the utility of the Connecticut hospital emergency department syndromic surveillance system (HEDSS) to monitor gastrointestinal (GI) illness in the community.

Introduction

The HEDSS system was implemented in 2004 to monitor disease activity (1). Twenty of 32 emergency departments (ED) and 1 urgent care clinic provide data. Chief complaints are routinely categorized into 8 syndromes.

Although previous studies have shown that ED syndromic surveillance is not useful for early detection of GI outbreaks (2), it has demonstrated utility in monitoring trends in seasonal norovirus activity (3). An evaluation to assess the utility of HEDSS to characterize endemic and outbreak levels of GI illness has not been previously conducted in Connecticut.

Methods

In Connecticut, *Campylobacter*, *Cryptosporidium*, *Cyclospora*, shiga toxin-producing *Escherichia coli* (STEC), *Giardia*, *Listeria*, *Salmonella*, *Shigella*, *Vibrio* and *Yersinia* are laboratory reportable findings. Aggregate hospital admissions data are reported daily by all hospitals. Facility and community GI outbreaks are also reportable events. Weekly percentage of HEDSS GI syndrome visits (combined GI, vomiting, diarrhea and bloody diarrhea) were compared to the number of GI hospital admissions, number of facility and community GI outbreaks and reportable enteric diseases using correlation coefficients. GI syndrome ED visits were also examined by geographical region and age.

Results

Vomiting and diarrhea were each highly correlated with the combined GI syndrome ($r=0.99$, $p<0.0001$; $r=0.93$, $p<0.001$, respectively), although vomiting has a greater magnitude than diarrhea. ED GI visits were correlated with GI hospital admissions ($r=0.73$, $p<0.0001$). Similar results were also seen when comparing HEDSS GI data to the number of total reported outbreaks ($r=0.76$, $p<0.0001$) and facility outbreaks ($r=0.71$, $p<0.0001$) but not community outbreaks alone ($r=0.09$, $p=0.23$). The combined GI syndrome was inversely correlated with laboratory confirmed cases of *Giardia* ($r=-0.18$, $p=0.02$), *Campylobacter* ($r=-0.45$, $p<0.0001$), STEC ($r=-0.32$, $p<0.0001$), *Listeria* ($r=-0.23$, $p=0.004$), *Salmonella* ($r=-0.41$, $p<0.0001$), *Shigella* ($r=-0.19$, $p=0.01$), *Vibrio* ($r=-0.36$, $p<0.0001$). No significant positive correlations were detected when controlling for seasonality or using

a narrower syndrome definition. There was no significant geographic variation in GI illness by region. Children younger than 5 years had a proportion of ED visits for GI illness that was consistently higher than all other age groups.

Conclusions

There is a strong and consistent association between ED visits for GI illness and facility outbreaks, the majority of which are suspected to be caused by norovirus (4,5). The strength of observed associations was similar when using a vomiting, diarrhea or combined GI syndromes; no significant correlations were observed when using the narrow bloody diarrhea syndrome. HEDSS GI syndromes were inversely correlated with illness caused by bacterial enteric pathogens, even when using the bloody diarrhea syndrome to identify more severe illness or controlling for seasonality. The HEDSS system is a critical tool for situational awareness of community gastrointestinal illness, particularly that which is caused by norovirus. Since norovirus is not a reportable condition in Connecticut, this system is used as the primary source of monitoring community GI illness.

Keywords

Syndromic surveillance; gastrointestinal; public health practice; evaluation

References

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