Syndromic Surveillance of Norovirus Using Sales of Non-Prescription Medications for Gastroenteritis

Victoria Edge[1,2], PhD, Frank Pollari[1], PhD, Lai King Ng[1], PhD, Pascal Michel[1], PhD, Scott McEwen[2], PhD, Jeff Wilson[1,2], PhD, Michael Jerrett[3], PhD, Paul Sockett[1], PhD, Wayne Martin[2], PhD

[1]Public Health Agency of Canada, [2]University of Guelph, [3]University of Southern California

Objective

To assess if over the counter (OTC) sales of gastrointestinal illness (GI) related medications are associated with temporal trends of reportable community viral, bacterial and parasitic infections.

Background

Syndromic surveillance using OTC sales has been shown to provide earlier signals of diarrheal [1] and respiratory disease [2] outbreaks than hospital diagnoses. Under normal circumstances, sales patterns of OTC sales related to GI are high in the winter and low in the summer [3]. The Canadian laboratory-based surveillance system that provides weekly counts of reportable bacterial, parasitic and viral isolates by province, has shown that bacterial and parasitic infections tend to be higher in summer and early fall, whereas viral infections (particularly Norovirus and Rotavirus) appear to peak in winter and spring [4]. This suggests that the OTC sales reflect underlying community viral infections rather than bacterial or parasitic infections. If OTC sales are to be considered for use in syndromic surveillance of community GI, the nature of this relationship needs to be clarified. The main objective of this study was to compare temporal distributions of GI-related OTC sales to laboratory-isolate patterns of bacterial, parasitic and viral cases of human GI infections.

Methods

The temporal patterns in weekly and seasonal sales of non-prescription products related to GI were compared to those of reportable viral, bacterial and parasitic infections in a Canadian province.

Results

Temporal patterns in OTC sales and Norovirus activity were similar (Figure 1), both having highest activity in winter months. In contrast, GI cases from both bacterial and parasitic agents were highest from late spring through early fall.

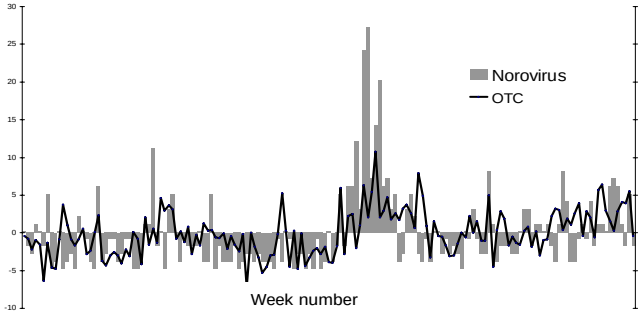

Figure 1. Weekly counts of Norovirus infections from April 2001 to April 2004, compared with OTC sales (January 2001-April 2004), each presented as a difference from their overall mean, in a Canadian province.

Conclusions

Non-prescription sales of anti-diarrheal and anti-nauseant products are a good predictor of community Norovirus activity. Syndromic surveillance through monitoring of OTC sales could be useful as an early indicator of the Norovirus season, allowing for appropriate interventions to reduce the number of infections.

References

[1] Hogan WR, Tsui FC, Ivanov O, et al. Detection of pediatric respiratory and diarrheal outbreaks from sales of over-the-counter electrolyte products. *J Am Med Inform Assoc* 2003; 10:555-62.

[2] Davies GR, Finch RG. Sales of over-the-counter remedies as an early warning system for winter bed crises. *Clin Micro Infect* 2003; 9: 858-863.

[3] Edge VL. Comparing Trends in Syndromic Data Sources For Surveillance Of Acute Gastrointestinal Illness in A Canadian Community. 2006; PhD thesis, Chapter 3. University of Guelph.

[4] Bowman C, Flint, J, Pollari F. Canadian Integrated Surveillance Report. *Salmonella*, Campylobacter pathogenic *E.coli* and *Shigella*, from 1996 to 1999. CCDR 2003; 29S1 http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/03vol29/29s1/index.html accessed: Jan 7 2006

Further Information:
Victoria Edge, Victoria_Edge@phac-aspc.gc.ca