"An Emergency Department Based Syndromic Surveillance System for Meningitis and Encephalitis, Maricopa County, AZ 2004"

Nelson Arboleda MD, MPH[1]; Aaron T Fleischauer PhD MPH[1]; Jim Sejvar, MD[1]; Alisa Diggs MPH[2]; Mare Schumacher MS[2]; Sarah Santana MPH[2]; David Engelthaler MS[3]; Ken Komatsu MPH[3]; Seyra Hughes MPH[3]; Greg Jones[1]; Lori Hutwagner MS[1].

[1]Centers for Disease Control and Prevention, Atlanta, GA; [2]Maricopa County Department of Public Health, Phoenix, AZ; [3]Infectious Disease Epidemiology Section, Arizona Department of Health Services, Phoenix, AZ.

OBJECTIVE

We developed, implemented and evaluated Meningitis and Encephalitis (M/E) syndrome case definitions based on electronic Emergency Department (ED) chief complaint data; and assessed their ability to detect aberrations that correspond with M/E outbreaks.

BACKGROUND

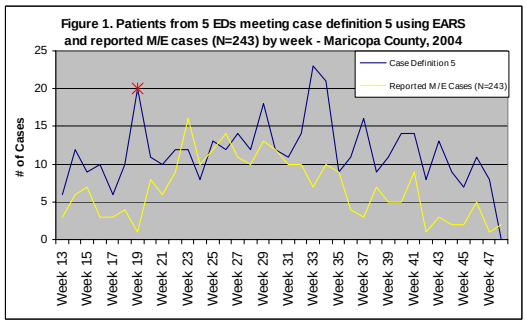
Evaluations of syndromic surveillance have typically assessed the validity of respiratory and gastrointestinal syndrome case definitions [1-3]; while rare syndrome categories such as neuro-infectious illnesses have not been thoroughly validated [4].

METHODS

Demographic information was collected from 948 M/E cases reported (e.g., aseptic meningitis, West Nile virus) to the Maricopa County Department of Public Health between April 1 and November 30, 2004. Medical records were reviewed for 570 (70%) of these cases. Abstracted data included ED visit date and time, age, gender, chief complaint and discharge diagnosis. Five increasingly restrictive M/E case definitions were created based on record reviews. Daily electronic ED data was received from 5 Maricopa County EDs for this time period. Aberration detection using the Early Aberration Reporting System (EARS) was performed for each case definition.

RESULTS

A total of 243 (26%) reported M/E cases visited the 5 hospitals for which electronic data was available. For 5 case definitions, sensitivity ranged from 18% to 71%. Specificity was high (98% to 99%) for all case definitions except for the least restrictive case definition (87%). The PPV ranged from 1% to 10%. Only the most restrictive case definition with 18% sensitivity and 99% specificity produced a signal prior to the increase in M/E reports (Figure 1).



CONCLUSIONS

Aberration detection was performed on a series of increasingly sensitive case definitions in order to retrospectively detect an aseptic meningitis and West Nile virus outbreak. While one case definition may have produced a meaningful and timely signal, this case definition was the least sensitive, but with the highest positive predictive value. Meningitis and encephalitis are rare events; case definitions for a neurological syndrome must balance sensitivity with positive predictive value.

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