Describing the Prevalence of Salmonella in Children 0-19 in Select Florida Counties

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ABSTRACT

Purpose: To describe trends in Salmonella in children among six Florida counties to see if an education program tailored to a specific group is needed.

Methods: Data from the surveillance system "Merlin" was used and demographic variables such as gender, race, ethnicity, and age. Data analysis were based on cases within the last five years (2/2012-2/2017). Salmonella rates between counties were compared, along with disease trends per year. Population demographics for each county were assessed as well, including gender, race, ethnicity, and age. This study used secondary data from the surveillance system "Merlin". Statistical Package for Social Sciences (SPSS) v23 (IBM, Inc.) was used for all analysis. Study population demographics were characterized by occupational group. Salmonella rates per county were analyzed using four different variables. Categorical variables analyzed in this study include gender, race, and ethnicity. Age was treated as an ordinal variable as it had been converted into age groups. The Salmonella cases analyzed in this study included all serotypes and were classified as either confirmed or probable. The case definition for a confirmed case of Salmonella is "a person with confirmatory laboratory evidence, and when available, O and H antigen serotype characterization should be reported" and a probable case is defined as "a clinically compatible illness (diarrhea must be present) in a person who is epidemiologically linked to a probable case".

RESULTS

A combined total of 8,984 confirmed and probable Salmonella cases among children 0-19 years of age in six Florida counties were reported during February 2012-February 2017. Escambia County had the overall highest rates of Salmonella (31.4 per 100,000 persons) followed by Pinellas County (20.8 per 100,000). As seen in Table 1, 1.5-year disease trend shows steady Salmonella rates in most counties, with increases in Palm Beach and Broward counties, and a decrease in Orange County, specifically from 2015 to 2016, as seen in Table 2. Rates were highest among white, non-Hispanic females, aged 1-4 in all counties. Broward County had 492 confirmed cases, highest rates were found among ages 1-4 years (27.4%), Whites (66.7%), non-Hispanics (83.5%) and, were equally distributed among males and females. Escambia County had 91 confirmed cases, highest rates were found among ages 1-4 years (23.4%), Whites (76.6%), non-Hispanics (90.4%), and females (51%). Hillsborough County had 290 confirmed Salmonella cases, highest rates were found among ages 1-4 years (20.3%), Whites (65%), non-Hispanics (71%), and females (54%). Orange County had 269 confirmed Salmonella cases, highest rates were found among ages 1-4 years (21%), Whites (61%), non-Hispanics (66%), and females (53%). Palm Beach County had 392 confirmed Salmonella cases, highest rates were found among children 1-4 years old (24%), Whites (71.4%), non-Hispanics (73.2%), and cases were equally distributed among males and females. Pinellas County had 188 confirmed Salmonella cases, highest rates found among children 1-4 years old (16.6%), Whites (84.5%), non-Hispanics (89.5%), and females (53.8%).

DISCUSSION

In this study the groups at most risk were consistent in all counties, which included the following: white non-Hispanic females aged 1-4 years old. These results are consistent with the CDC (2014) study in which children under 5 years old were shown to be at higher risk for Salmonella, as well as the study by Younus, Wilkins, Ashraf, Rahbar & Saeed (2006) which showed children less than 1 year and 1-4 years old had highest Salmonella rates. Olsen et al. (2001) found the highest rates in infants, particularly during the second month of life. These results could be due to infants and children's unique exposure ways, including pollutants that pass through breastmilk and their hand-to-mouth and object-to-mouth behaviors. Younus, Wilkins, Ashraf, Rahbar & Saeed (2006) showed no general trends in the prevalence in the United States. The study by Vugia et al (2004) showed Salmonella infection rates were higher among blacks, Asians, and Hispanics than among whites. These results are similar to Quinlan (2013) study which showed African American and Hispanic populations are positively associated with incidence of salmonellosis. This conflicting evidence may exist due to differences in data sources and better access to healthcare by some racial and ethnic groups. The highest Salmonella rates found in Escambia County could be due to the existence of an outbreak, or better reporting by the consumers and providers. The steady Salmonella rates over the last 5 years in all the counties could be due to a lack of food safety and lack of education among consumers, particularly in households with young children about cross contamination issues. This study has several limitations, including its cross-sectional study designs and the inclusion of both confirmed and probable Salmonella cases, there's a chance that the “probable” cases were not indeed Salmonella.

CONCLUSIONS

The purpose of this study is to describe trends in Salmonella prevalence among children in six Florida counties to see if an education program tailored to a specific group is needed. The steady Salmonella rates over the last 5 years show that this infection is a statewide problem and an education program is needed. This data, in compliance with previous literature shows that Salmonella rates are highest in children under 5 years of age, who are more likely to get sick from it; therefore education programs should be tailored towards this group. Research on Salmonella prevalence could continue in several directions. More research on Salmonella prevalence specific to gender, race, and ethnicity would help clear up conflicting evidence. More detailed research on children 0-5 years old and the specific route of Salmonella transmission would help in developing education programs on Salmonella prevention. More information about the use of Salmonella rapid test and screening tests, including culture techniques, immunomagnetic separation, ELISA and ELISA, and molecular techniques using PCR-based assays is needed in Florida in order to produce results in 48 hours or less.

REFERENCES


Kennedy, M., Wilar, R., Vugia, D.J., RabatseY-Ehr, T., Farley, M.M., Pasci, A., et al. (2015). Younus, Wilkins, Rahbar & Saeed (2006) study showed no gender differences because of the existence of an outbreak, or better reporting by the consumers and providers. This steady Salmonella rates over the last 5 years in all the counties could be due to a lack of food safety and lack of education among consumers, particularly in households with young children about cross contamination issues. This study has several limitations, including its cross-sectional study designs and the inclusion of both confirmed and probable Salmonella cases, there's a chance that the “probable” cases were not indeed Salmonella.

