A *Shigella* outbreak in Barshash

In April 1993 the Ministry of Health identified an outbreak of *Shigella dysenteriae* type 1 resistant to ampicillin, tetracycline, chloramphenicol and trimethoprim sulfamethoxidate and sensitive to nalidixic acid. All health regions were asked to report isolations of *S. dysenteriae* type 1. The Eastern Province responded with a report of two isolations of multiply resistant *S. dysenteriae* type 1 in visitors from Barshash, a village near Najran city. They were Yemenis and said that many of their relatives in Barshash had bloody diarrhea.

Beginning in week 19 of 1993, monthly case reports and admission, laboratory, emergency room and physician logbooks at King Khalid Hospital, the Barshash primary health care center (PHCC) and six other PHCCs were reviewed to find dysentery cases. During the next two weeks the Barshash PHCC began recording every bloody diarrhea case and interviewing patients and their families and visiting their homes with a control team.

During weeks 22 and 23, the control team began chlorinating all water tanks. We conducted a case-control study in Barshash by comparing risk factors between 31 houses with one or more persons with bloody diarrhea and 31 houses with no bloody diarrhea from January to June 1993.

We detected 859 cases of dysentery in Barshash from January to June 1993 (attack rate/1,000=151.2). Six developed HUS. The number of dysentery cases reported per week rose from 18 in February to 160 in May. Sixty percent of the cases were male, and the median age was 6 years (SD=15.4). Multiply resistant *S. dysenteriae* type 1 was isolated from four cases.

Families with bloody diarrhea reused washing water in the latrine more frequently than families in control houses (odds ratio [OR]=5.9; 95% confidence interval [CI] 1.3-31). Houses with bloody diarrhea cases also had stool in the yard around the toilet more often than control houses (OR=10; 95% CI 1.2-239).

The mother's presence in homes during the illness of a child was more common in houses with only primary cases than in homes with secondary cases (OR=12; 95% CI 1.1-298). Among individuals in the houses, handwashing after defecation was protective (OR=0.3; 95% CI 0.1-0.7), but handwashing from the same container used for perianal cleaning was associated with dysentery (OR=2.9; 95% CI 1.1-8).

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Editorial note: *Shigella*, a gram-negative bacillus that occurs exclusively in humans and subhuman primates, is very susceptible to high ambient temperatures and to desiccation; and survives longer in a cooler humid environment, especially *S. sonnei*[1]. A two-year study at King Khalid University Teaching Hospital found that shigellosis is responsible for the etiology of 1% of all childhood gastroenteritis in Riyadh[2].

It is necessary, especially during outbreaks of shigellosis, to promote handwashing practices and use of soap after defecation, changing diapers and before eating in order to interrupt transmission. Emphasizing personal hygiene was found to be an effective and practical method for interrupting shigellosis; it markedly reduced secondary infection and case rate except in cases of *S. dysenteriae* type 1.

Failure in *S. dysenteriae* type 1 might be due to its greater virulence and smaller dose requirement for infection[3]. However, interventions to change people's behavior and improve their personal hygiene levels are quite difficult. The reported study identified local unhygienic practices involved in perpetuation of the outbreak and thence suggested avenues for control measures.

The danger of presumptive treatment for bloody diarrhea and the vital role of surveillance system in controlling outbreaks of shigellosis have been discussed in a previous issue of this bulletin; inappropriate use of antibiotics has been implicated as the cause of hemolytic uremic syndrome in children under 11 years of age in southern Saudi Arabia[4].

References

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Figure 1: Gastroenteritis and dysentery by date of onset