

VIRGINIA EPIDEMIOLOGY BULLETIN

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Shigellosis on the Rise in Virginia

Recent Trends

A steady increase in the number of cases reported to the Virginia Department of Health has occurred since 1984 (see Figure). The greatest recent increase has occurred among nonwhite children less than age 5, with rates rising from 12 cases/100,000 population in 1987 to 75 cases/100,000 in 1988. A lesser increase in rate has occurred in the nonwhite population between ages 6 and 10 and in the nonwhite population between the ages of 25 and 40. The rates for whites of all ages are essentially unchanged.

The number of reported cases of *Shigella* infections has also been increasing nationwide. Cases caused by the *Shigella sonnei* have shown the most notable increase, with approximately 7,000 cases reported to the Centers for Disease Control (CDC) in 1986, and 11,000 in 1987. There does not appear to be a change in the epidemiology of the disease, since the distribution by age, sex and season have remained stable. A secular trend is suggested by a similar increase which occurred from 1969 to 1974, when the number

of cases tripled, then returned to a baseline level of between 5,000 to 7,000 cases reported each year.¹

Clinical Manifestations

Shigellosis is caused by any of four gram negative bacterial species: *S. dysenteriae*, *S. flexneri*, *S. boydii* and *S. sonnei*. The most common isolate in the U.S. is *S. sonnei*, which is also the least pathogenic.

Symptoms range from mild infection to classic life-threatening dysentery. The latter begins with fever, abdominal cramps, tenesmus, and voluminous watery diarrhea, followed by a decrease in fever and an increase in the number of stools of smaller volume mixed with blood and mucus.² Severity of illness is a function of the host (young age and malnutrition are risk factors), the size of the infecting dose, the species (*S. dysenteriae* is the most pathogenic and is most commonly isolated from travelers returning from developing countries), and plasmid-associated virulence factors. In the U.S., the most common syndrome consists of fever accompanied by abdominal cramps and watery diarrhea without passage of blood or mucous. Some patients are asymptomatic.

Sequelae of shigellosis include hemolytic-uremic syndrome and Reiter's Syndrome (occurring in less than 10% of cases). Well nourished individuals have self-limited disease that lasts typically for 7-10 days.

Diagnosis

The diagnosis is suggested by a history of febrile diarrhea and the

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finding of fecal leukocytes on microscopic examination of a stool or rectal mucus specimen stained with methylene blue. Confirmation is by isolation of the organism from stool or rectal swab.

Treatment

Treatment of *Shigella* infection consists of support for symptoms, rehydration, electrolyte replacement, and may or may not include antibiotic therapy. Those at highest risk for sequelae, the elderly, malnourished, and those infected by the more pathogenic species, should be treated with antibiotics. In other cases, most of which are self-limited, the benefits of treatment, shorter duration of illness and shorter period of excretion, need to be balanced against the risk of developing multiply resistant strains of *Shigella*. The drug of choice for sensitive strains is ampicillin (amoxicillin is ineffective) or tetracycline (for patients nine years old or older). Approximately half the strains isolated are now resistant to ampicillin. Trimethoprim-sulphamethoxazole (TMP-SMZ) is the preferred treatment for infection by *Shigella* when drug sensitivity is unknown.³ An alternative drug is ciprofloxacin,⁴ a new quinolone antimicrobial, which is particularly useful for the rare organism found to be resistant to TMP-SMZ, but it is not recommended for children or pregnant women (see package insert). Anti-motility drugs are contraindicated.

General Control Measures

Spread of disease is via the fecal-oral route, and the only reservoir for the organism is man (plus a few non-human primate species). Evidence suggests that the increase in number of cases in Virginia is due to person-to-person spread and not a result of contamination of a food or water supply. Personal hygiene, i.e. hand-washing, remains the most effective method of prevention. This is especially important in families with children less than 5 years old.

Persons known or suspected to be infected with *Shigella* should not continue working as foodhandlers or providing care to children or patients until two to three successive stool samples or rectal swabs, collected \geq 24 hours apart (but not sooner than two days after discontinuing antibi-

otics), have been found to be negative for *Shigella* on culture.

Control in Daycare Centers

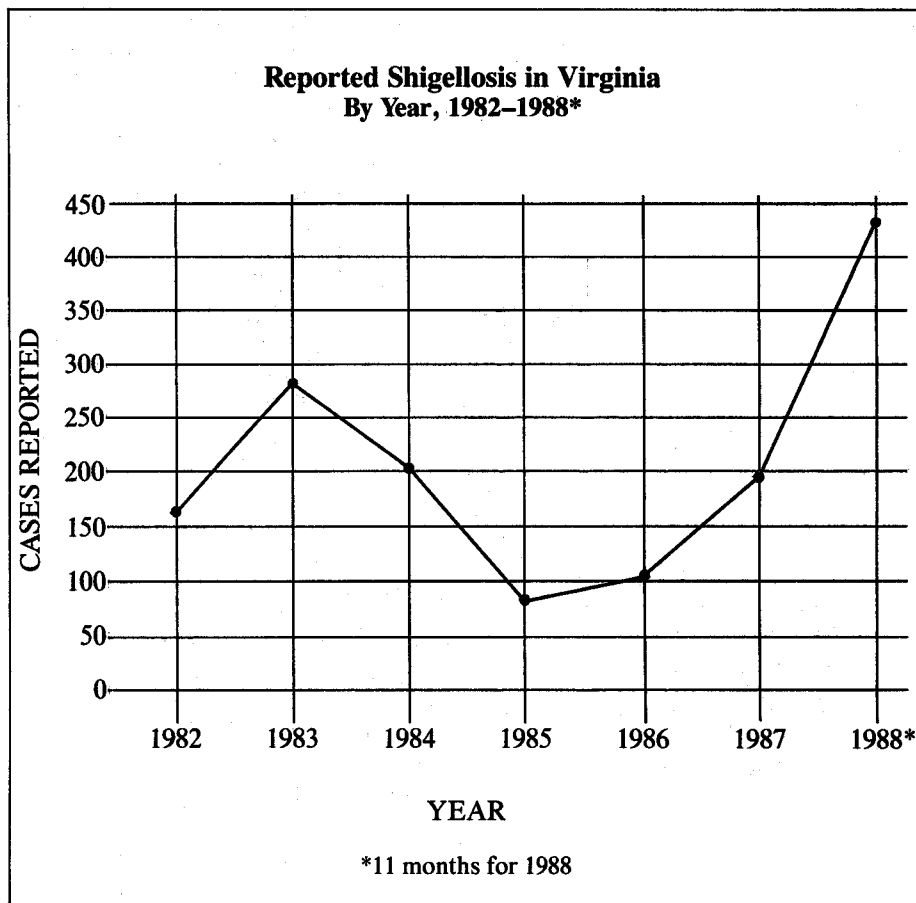
Daycare centers provide settings where transmission may be facilitated and implementation of controls difficult. This results from children's natural tendency to explore their environment with frequent person-to-person, hand-to-mouth or object-to-mouth contact, early or nonexistent toilet training, undeveloped personal hygiene, and the need for hands-on care by center staff. These factors are especially important in light of the very small infectious dose (\leq 200 organisms) needed for transmission of shigellosis.⁵

Of the three major options for control, namely exclusion of ill or infected children from the center, closing the center, and cohorting of infected children, none is without drawbacks. The first two may facilitate community transmission by resulting in a parent placing an infected child in another, uninvolved center. The last option, cohorting, requires sufficient space, personnel, and training.

Although controlled studies are

needed to document the effectiveness of these and other suggested measures to reduce transmission, a number of recommendations have been made:⁶

- Reinforce education of staff in basic hygiene.
- Clean diaper-changing surface after each use.
- Avoid having staff who care for diapered children prepare food.
- Exclude children with active diarrhea.
- Consider culturing all children and staff and cohorting infected and noninfected persons into separate groups, or excluding infected persons until culture-negative on two to three specimens (see above).
- Consider treating all culture-positive individuals (whether asymptomatic attendees or those temporarily excluded) with antimicrobial therapy to shorten the duration of excretion.



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Reported by Lynne Penberthy, MD, MPH, and Carl W. Armstrong, MD, Office of Epidemiology, VDH.

Recommendations of the Immunization Practices Advisory Committee of the U.S. Public Health Service

Cholera Vaccine

Introduction

Historically, endemic and epidemic cholera commonly has occurred in parts of southern and southeastern Asia. Since 1961, cholera caused by the EI Tor biotype has been epidemic throughout much of Asia, the Middle East, and Africa and in certain parts of Europe. Infection is acquired primarily by consuming contaminated water or food; person-to-person transmission is rare. Travelers who follow the usual tourist itinerary and who use standard accommodations in countries affected by cholera are at virtually no risk of infection.

Cholera Vaccine

Cholera vaccines*, whether prepared from Classic or EI Tor strains, are of limited usefulness. In field trials conducted in areas with endemic cholera, vaccines have been only about 50% effective in reducing the incidence of clinical illness for 3-6 months. They do not prevent transmission of infection. Therefore, the Public Health Service no longer requires cholera vaccination for travelers coming to the United States from cholera-infected areas, and the World Health Organization (WHO) no longer recommends cholera vaccination for travel to or from cholera-infected areas. Surveillance and treatment are sufficient to prevent spread of the disease if it were introduced into the United States.

Vaccine available in the United States is prepared from a combination of phenol-inactivated suspensions of classic Inaba and Ogawa strains of *Vibrio cholerae* grown on agar or in broth.

*Official name: Cholera Vaccine.

Vaccine Usage

General Recommendations

Vaccine should not be used to manage contacts of persons with imported cases or to control the spread of infection. Repeated vaccination is required or advised sometimes for laboratory workers and airline and ship crews. However, such groups are unlikely to acquire or transmit cholera. Because information on the long-term safety of repeated vaccination is limited, such practices should be discontinued for airline and ship crews except when resolutely demanded by some countries for international travel.

Vaccine is not recommended for infants <6 months of age and is not required for travel by most countries.

Vaccination for International Travel

The risk of cholera to U.S. travelers is so low that the vaccine is not likely to benefit most U.S. travelers. Persons using standard tourist accommodations in countries affected by cholera are at virtually no risk of infection. The traveler's best protection against cholera, as well as against many other enteric diseases, is to avoid food and water that might be contaminated.

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However, many countries affected or threatened by cholera require evidence of cholera vaccination for entry. One dose of vaccine will usually satisfy entry requirements for persons who anticipate travel to such countries and who will be vaccinated in the United States.

With the threat or occurrence of epidemic cholera, health authorities of some countries may require evidence of a complete primary series of two doses or a booster dose within 6 months before arrival. The complete primary series is otherwise suggested only for special high-risk groups that work and live in highly endemic areas under less than sanitary conditions (Table 1).

Vaccination requirements published by WHO are regularly updated and summarized for travelers by the Public Health Service and distributed to state and local health departments, airlines, travel agents, many physicians, and others. Physicians and travelers should seek information on requirements from these sources.

Physicians administering vaccine to travelers should emphasize that an International Certificate of Vaccination against cholera must be validated for it to be acceptable to quarantine authorities. Validation can be obtained at most city, county, and state health departments as well as many private clinics and physicians' offices. Failure to secure validation may cause travelers to be revaccinated or quarantined. A properly documented certificate is valid for 6 months, beginning 6 days after vaccination or beginning on the date of revaccination if this revaccination is within 6 months of a previous injection.

Data have indicated that persons given yellow fever and cholera vaccines simultaneously or 1-3 weeks apart had initially lower-titered antibody responses to both vaccines. However, seroconversion rates were unaffected, and the clinical importance of these data are unknown. In view of these data, yellow fever and cholera vaccines ideally should be given at least 3 weeks apart. If that is not possible, and both vaccines must be given, then they can be given simultaneously or at any time within the 3-week interval, although

Table 1. Recommended doses, by volume, for immunization against cholera

Dose no.	Route and age			
	Intradermal*	Subcutaneous or intramuscular		
	≥5 yrs.	6 mos-4 yrs	5-10 yrs	>10 yrs
1 and 2	0.2 mL	0.2 mL	0.3 mL	0.5 mL
Boosters	0.2 mL	0.2 mL	0.3 mL	0.5 mL

*Higher levels of protection (antibody) may be achieved in children <5 years old by the subcutaneous or intramuscular routes.

a delay in expected yellow fever protection may occur.

Primary Immunization

Complete primary immunization consists of two doses of vaccine given at least 1 week apart. The intradermal route is satisfactory for persons ≥5 years of age (Table 1).

Booster Doses

Booster doses may be given every 6 months if necessary for travel or for residence in highly endemic, unsanitary areas. In areas where cholera occurs in a 2-3 month season, protection is best if the booster dose is given at the beginning of the season. The primary series does not need to be repeated for booster doses to be effective.

Precautions and Contraindications

Reactions

Vaccination often results in 1-2 days of pain, erythema, and induration at the site of injection. The local reaction may be accompanied by fever, malaise, and headache.

Serious reactions following cholera vaccination are extremely rare. If a person has had a serious reaction to the vaccine, revaccination is not advised. Most governments will permit an unvaccinated traveler to proceed if he/she carries a physician's statement of medical contraindication. However, some countries may quarantine such unvaccinated persons or place them under surveillance if they come from areas with cholera.

Pregnancy

No specific information exists on the safety of cholera vaccine during pregnancy. Its use should be individualized to reflect actual need.

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Letter To The Editor: Availability of Pasteurized Eggs

To the Editor: I am writing to you regarding an article in the *Epidemiology Bulletin* of October 1988, entitled "Egg-Associated Salmonellosis." On page 2 you state "Food recipes that call for raw eggs should substitute pasteurized eggs." Using this information I have received numerous requests regarding the obtaining of pasteurized eggs. I would appreciate any help you can give me concerning this. Specifically, where can the average individual obtain such pasteurized eggs for making his holiday eggnog?

David L. Warren, MD
Richmond, VA

In Reply: In response to this and other inquiries regarding the availability of pasteurized egg products, we learned that there are indeed only a very limited number of manufacturers of pasteurized egg products in the eastern half of the United States, and even fewer who sell in quantities practical for noncommercial users. The following are companies* which provide pasteurized egg products that are of practical value for the noncommercial user:

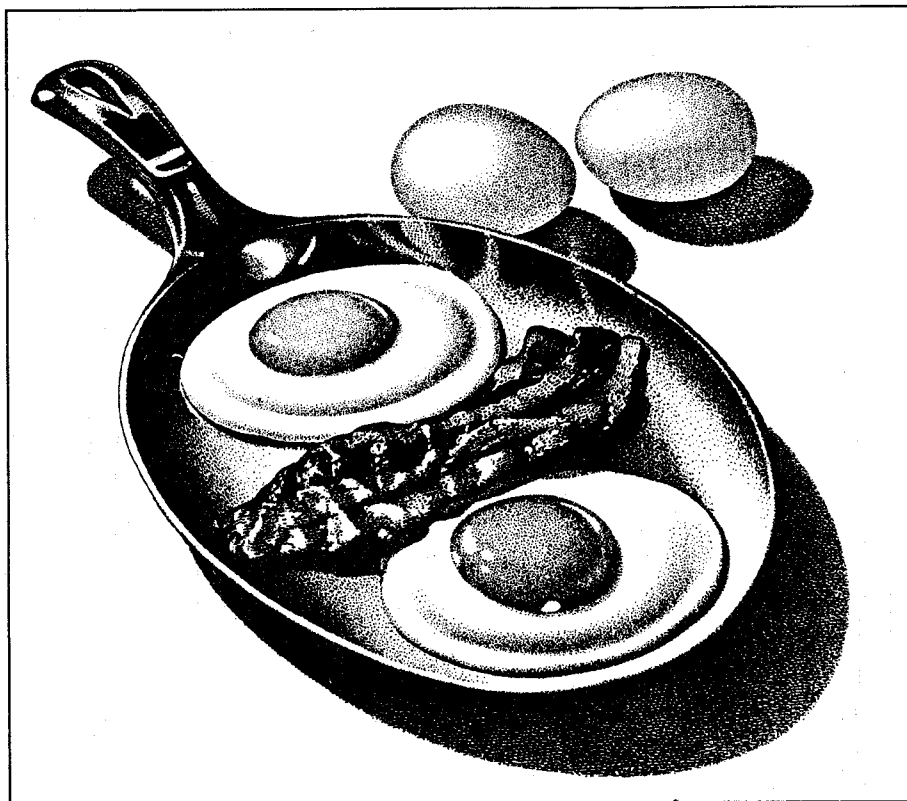
1. **Easy Eggs:** These are pasteurized and homogenized whole eggs. They are available in one liter containers, equaling approximately 22 whole eggs. They are the only whole egg product (liquid) that can be stored in the refrigerator for up to 6 weeks. This product can be used in any recipe calling for whole eggs. The manufacturer is:
Morning Glory Eggs Inc.
P.O. Box 373
Richfield, NC 28137

This product is not available in the supermarket, but can be purchased from restaurant supply stores. There are currently three supply houses in Virginia which carry Morning Glory Products:

Richmond Restaurant Service
in Richmond

*The use of trade names is for identification only and does not imply endorsement by the Virginia Department of Health or the Commonwealth of Virginia.

Epidemiology Bulletin



Sandler Foods in Virginia
Beach
Frigid Freeze in Roanoke.

In addition to Easy Eggs, this company will soon be producing a commercially available decholesterolized (93% cholesterol free) liquid whole egg product. It will be available in mid-1990.

2. **Dehydrated eggs** which have been pasteurized are available in packets weighing approximately six ounces. This product contains whole egg, dehydrated milk and oil. It can be used in baking or scrambling, but is probably not suitable for use in recipes which call for raw eggs. The packets come in cartons of 30, and may be stored for up to one year. They may be ordered for \$19.80 (plus shipping charge) from:
Sonstegard Food Co.
707 E. 41st St. Suite 222
Sioux Falls, SD 57105

3. **Egg Beaters** is the only pasteurized egg product we were able to find in the refrigerator sec-

tion of most grocery stores. This product contains only the egg white portion of the egg, with no yolk. It may be used in many recipes which call for raw eggs, with reportedly little difference in taste. An additional advantage of Egg Beaters is that it contains no cholesterol.

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Have an Idea for the *Bulletin*?

The editor welcomes any reports of cases, outbreaks, or public health problems of interest to the *Bulletin's* readers. Such accounts and any other comments or suggestions regarding the *Bulletin* should be addressed to: Editor, *Epidemiology Bulletin*, Office of Epidemiology, Room 700, 109 Governor Street, Richmond, Virginia 23219.

Cases of selected notifiable diseases, Virginia, for the period December 1, through December 31, 1988.

Disease	State					Regions				
	This Month	Last Month	Total to Date		Mean 5 Year To Date	This Month				
			1987	1988		N.W.	N.	S.W.	C.	E.
Measles	19	20	1	239	23	0	0	18	1	0
Mumps	3	2	88	139	48	0	3	0	0	0
Pertussis	6	2	58	29	41	2	1	0	1	2
Rubella	0	0	1	11	1	0	0	0	0	0
Meningitis—Aseptic	13	45	281	210	322	0		0	4	9
*Bacterial	22	24	185	185	229	4	3	4	6	5
Hepatitis A (Infectious)	21	15	244	362	164	2	4	0	2	13
B (Serum)	37	33	448	343	519	2	4	10	6	15
Non-A, Non-B	4	6	51	77	82	2	0	0	0	2
Salmonellosis	88	129	1830	1733	1533	11	18	15	20	24
Shigellosis	64	39	247	497	184	4	11	2	33	14
Campylobacter Infections	66	87	639	731	646	10	18	15	14	9
Tuberculosis	34	39	458	406	471	2	7	5	7	13
Syphilis (Primary & Secondary)	50	36	318	449	385	0	6	9	18	17
Gonorrhea	1507	1014	14353	14464	18707	—	—	—	—	—
Rocky Mountain Spotted Fever	0	0	22	18	41	0	0	0	0	0
Rabies in Animals	28	30	363	366	315	4	1	4	8	11
Meningococcal Infections	5	8	72	59	71	2	1	1	1	0
Influenza	23	21	1284	2509	1855	0	0	0	8	15
Toxic Shock Syndrome	1	0	1	2	7	0	0	0	0	1
Reye Syndrome	0	0	0	0	3	0	0	0	0	0
Legionellosis	0	1	12	11	25	0	0	0	0	0
Kawasaki's Disease	1	1	31	14	29	0	0	0	0	1
Acquired Immunodeficiency Syndrome	31	31	270	376	—	2	14	1	9	5

Counties Reporting Animal Rabies: Albemarle 1 fox; Amelia 1 skunk; Botetourt 1 skunk; Charles City 1 raccoon; Chesterfield 1 goat; Clarke 1 raccoon; Henrico 1 bat, 3 raccoons; James City 1 cat, 1 fox, 5 raccoons, 1 skunk; Loudoun 1 skunk; Louisa 1 raccoon; Page 1 skunk; Richmond City 1 raccoon; Scott 1 skunk; Washington 2 skunks; Williamsburg 2 raccoons; York 1 raccoon.

Occupational Illnesses: Asbestosis 15; Carpal Tunnel Syndrome 15; Loss of Hearing 10; Mesothelioma 1; Pneumoconioses 30.

*other than meningococcal

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