

6. Demisie A, Ayres RC. Chickenpox in the elderly. *Br J Clin Pract* 1989;43: 422–424.
7. GlaxoSmithKline. Diseases: Varicella-Disease [on-line]. Available at [www.worldwidevaccines.com/varicella/disease.asp](http://www.worldwidevaccines.com/varicella/disease.asp) Accessed February 26, 2005.
8. Varicella [on-line]. Available at [www.cdc.gov/nip/publications/pink/varicella.rtf](http://www.cdc.gov/nip/publications/pink/varicella.rtf) Accessed June 15, 2005.
9. Koskiniemi M, Piiparinen H, Rantalaiho T et al. Acute central nervous system complications in varicella zoster virus infections. *J Clin Virol* 2002;25: 293–301.
10. Liu HC, Tsai TC, Chang PY et al. Varicella orchitis: Report of two cases and review of the literature. *Pediatr Infect Dis J* 1994;13:748–750.

## NASCHER AND FRAILTY

*To the Editor:* Frailty is a state encountered in older patients in which there is vulnerability to stressors.<sup>1</sup> It has a short history as a coherent concept in geriatrics, although analogous states can be found in older literature.<sup>2</sup> I. L. Nascher coined “geriatrics” as a term. His 1914 book on the topic is considered an important early work, providing a comprehensive review of what was then thought about aging and the clinical care of the aged.<sup>3</sup> Did he describe what we would recognize as frailty? If so, what did he think was its cause, and what did he advise for therapy?

Nascher divided the conditions encountered in older patients into primary senile diseases (that represent “an increase, decrease or perversion” of the normal changes encountered with aging), secondary senile diseases, modified diseases of old age, preferential diseases, and diseases uninfluenced by age.<sup>3</sup> He placed what would be most akin to frailty in the primary category. The first condition he described as a primary senile disease was “senile cachexia” or “senile debility.” He also discussed “senile muscular degeneration,”<sup>3</sup> but this letter will focus on senile cachexia/senile debility.

Nascher wrote that senile debility represented the “vitiated condition of the senile organism.”<sup>3</sup> The section on its pathology dealt primarily with the blood. Nascher felt that “undoubtedly some change in the character of the blood of the aged” existed. The blood of the aged retained “the products of defective metabolism,” had a lowered “nutritive value,” and was more “viscid . . . [which] favors coagulability.”<sup>3</sup>

He held that the “underlying causes of senile cachexia are the underlying causes of ageing” and that it “is no more a pathological condition than is the weakness of the infant.”<sup>3</sup> He noted “a remarkable similarity . . . [to] the cachexia of unsanitary life,” suggesting to him the importance of nutrition, air quality, and sunshine as etiological factors.<sup>3</sup> Nascher also commented on psychic factors. He was unsure whether they were “causative or resultant,” but “in either case . . . [they] exaggerate the objective and subjective manifestations of this condition.”<sup>3</sup> He felt that, in “every case, . . . physical and psychic factors are involved, the latter playing but an insignificant part in some cases, while in others it may be the major etiological factor” and in “almost every case where senile debility occurs early and proceeds rapidly the psychic factor is the main cause.”<sup>3</sup>

The manifestations of senile debility were those of the “senile state” and included “general physical weakness,” “waste of tissue,” and “impairment of the special senses, mental impairment, intensified emotions, especially fear, minor physical defects, as broken-down arches, hypersensitiveness, etc.”<sup>3</sup> With senile debility, fatigue occurred

“more rapidly, is more profound, and recovery takes longer.”<sup>3</sup> He dealt at length with the typical posture (the “senile stoop”) that arose from anatomical changes and its differentiation from the “senile slouch,” which occurred from psychic factors.<sup>3</sup> “Senile tremor and senile dementia” could complicate senile cachexia.<sup>3</sup> In the differential for the state, he listed a number of conditions, emphasizing tuberculosis.

For its management, he felt that medicinal, psychic, and hygienic measures should be used. He recommended phosphorous, strychnine, arsenic, and coffee or caffeine as effective medicinal agents. For joint stiffness (which he called “senile arthrosclerosis”), he said that “salicylates . . . are absolutely useless,” although sometimes psychic measures, hydrotherapy, or drugs could be effective.<sup>3</sup> He held that psychic measures were “most important” and suggested flattery, “especially from a young person of the opposite sex,” and “relief from worry.”<sup>3</sup> He felt that associating “with younger persons . . . (and) especially marriage will do more to dispel the feeling of mental and physical debility than any medical measure.”<sup>3</sup> Hygienic measures he advocated included mental stimulation, adequate nutrition, exercise, cleanliness, proper clothing, fresh air, and regular toileting.<sup>3</sup>

Although not an exact match, the concept of senile cachexia/senile disability has parallels to frailty. I believe that he would view the state of frailty as tightly coupled to aging and include neuropsychiatric manifestations as cardinal features. His speculation about some factor or factors in the blood underlying the condition is fascinating. Finally, his multifaceted approach to management, if not his specific therapeutics, represents useful advice.

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## REFERENCES

1. Fried LP, Walston J. Frailty and failure to thrive. In: Hazzard WR, Blass JP, Ettinger WH Jr et al., eds. *Principles of Geriatric Medicine and Gerontology*, 5th Ed. New York: McGraw-Hill, 2003, pp 1487–1502.
2. Hogan DB, MacKnight C, Bergman H. Models, definitions and criteria for frailty. *Aging Clin Exp Res* 2003;15(Suppl 3):3–29.
3. Nascher IL. *Geriatrics—the Diseases of Old Age and Their Treatment Including Physiological Old Age, Home and Institutional Care, and Medico-Legal Relations*. Philadelphia: P Blakiston's Son & Co., 1914.

## RISK FACTORS FOR *SALMONELLA* ORANIENBURG OUTBREAK IN A NURSING HOME IN MICHIGAN

*To the Editor:* *Salmonella* Oranienburg is a relatively uncommon serotype, ranking ninth in frequency in 2003 in the United States.<sup>1</sup> It has been associated with outbreaks in

several countries.<sup>2</sup> Besides gastroenteritis, it can cause vertebral osteomyelitis and paravertebral abscess,<sup>3</sup> soft tissue and cartilage infection,<sup>4</sup> and retroperitoneal abscess.<sup>5</sup> This letter describes a *S. Oranienburg* outbreak in a Michigan nursing home and describes the resident-level risk factors.

From June to September 1994, 13 laboratory-confirmed cases of *S. Oranienburg* were detected. Twelve (92%) of the cases were in women. Patients ranged in age from 76 to 97. The symptoms included diarrhea (69%), fever (53%), vomiting (30%), and nausea (15%). Three cases (23%) were asymptomatic. In November, two more cases were detected.

In 1995, five cases were detected in January, 20 in February (5 symptomatic cases and 15 from stool culturing), 34 in March (all from stool culturing), one in April, three in May (all from stool culturing), two in June, two in July, four in August, two in September, and two in October. Four culture-confirmed diagnoses occurred in the nursing home staff. Inspection of the food service facilities by a certified food service sanitarian revealed that the kitchen was well run, and no *Salmonella* was isolated from foods.

A case-control study was conducted to determine resident-level risk factors for the infection. Cases were residents of the nursing home who had diarrhea, and *S. Oranienburg* was isolated from their stool samples between June 1994 and October 1995. Controls were residents who were asymptomatic and stool-culture negative for *Salmonella*. Information about cases and controls (demographic data, use of antimicrobial agents, gastrointestinal symptoms, results of laboratory cultures, underlying illnesses, and routine medication) was abstracted from their medical records. The Mann-Whitney *U* test was used to compare group means for nonparametric data. Chi-square or Fisher exact tests were used to compare differences in proportions between cases and controls. Odds ratios (ORs) with 95% confidence intervals (CIs) were determined. Variables addressing comorbidities and routine medications with ORs greater than 1 were evaluated for the effect of confounding using logistic regression analysis. Variables with ORs greater than 1 using logistic regression analysis were further evaluated in the final model. EpiInfo 2004 (version 3.3, Centers for Disease Control and Prevention, Atlanta, GA) was used for all calculations.

Eighteen cases were compared with 22 controls. The cases did not differ significantly from the controls with respect to sex (78% vs 68% female; OR = 1.63, 95% CI = 0.39–6.81), race (89% vs 91% white; OR = 1.25, 95% CI = 0.16–9.88), and mean age (85 vs 80, *P* = .17). After adjusting for the analgesic used, arthritis, diabetes mellitus, gastrointestinal disorder, hip fracture, and other mental disorder, dementia remained significantly associated with infection (OR = 41.9, 95% CI = 4.0–439.6) (Table 1).

This study found that residents of the nursing home with dementia were at higher risk for *S. Oranienburg* infections than controls without dementia. This may be because residents with dementia are less able to observe their basic self-care and hygiene. As in many *Salmonella* outbreaks in nursing homes,<sup>6,7</sup> the food vehicles or sources for *S. Oranienburg* infection in this outbreak could not be identified. The infrequently distributed number of cases over time indicates that transmission may have been person

**Table 1. Logistic Regression Analysis of Characteristics of Cases with *Salmonella* Oranienburg Infection and Controls in a Nursing Home, Michigan, June 1994 to October 1995**

Characteristic	Odds Ratio (95% Confidence Interval)	<i>P</i> -value
<b>Underlying diseases</b>		
Arthritis	5.0 (0.5–50.6)	.18
Dementia	41.9 (4.0–439.6)	.002
Diabetes mellitus	7.2 (0.5–99.9)	.14
Gastrointestinal tract disorder*	3.7 (0.2–58.6)	.36
Hip fracture	2.2 (0.04–112.4)	.67
Other neurological disorder†	6.4 (0.7–61.8)	.11
Routine medication: analgesic used	3.9 (0.6–24.4)	.14

\*Colitis, chronic diarrhea, diverticulitis, esophagitis, gastroesophageal reflux disease, hiatal hernia, pancreatic cancer, peptic ulcer disease, retroperitoneal abscess, or chronic liver failure.

†Alzheimer's disease, anxiety, ataxia, brain tumor, depression, multiple sclerosis, peripheral neuropathy, Parkinson's disease, or seizure.

to person. Person-to-person spread by asymptomatic residents may be possible, because three cases that were detected from June to September 1994 were asymptomatic, although the index case could not be ascertained. The nursing home staff also may have played a role in the transmission of *S. Oranienburg* to susceptible residents, because four asymptomatic staff members were also detected. Even though the food vehicle could not be identified, it is conceivable that contaminated raw food or vegetables may have been the source of the infection directly or through cross-contamination from raw food items (e.g., in blender or meat grinder) or contamination from asymptomatic food handlers.<sup>8,9</sup> In conclusion, nursing home residents with dementia were at higher risk of contracting *Salmonella* infection in this Michigan outbreak. Therefore, this group needs an elevated level of attention to prevent exposure to *Salmonella*.

The importance of the presence of uncommon *Salmonella* serotypes in nursing homes should not be underestimated, because it can cause severe infection in residents with compromised immune function, diminished physiological functions, decreased gastric acidity, and treatments involving antimicrobial agents.<sup>10</sup> Therefore, foods that are known to be vehicles for *Salmonella*, such as foods of animal origin and fresh produce, should be offered with caution to residents of nursing homes.

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## REFERENCES

1. Salmonella Surveillance: Annual Summary, 2003 [on-line]. Atlanta, GA: U.S. Department of Health and Human Services, CDC. Available at [www.cdc.gov/ncidod/dbmd/phlisdata/salmonella.htm](http://www.cdc.gov/ncidod/dbmd/phlisdata/salmonella.htm) Accessed December 7, 2004.
2. Kumao T, Ba-Thein W, Hayashi H. Molecular subtyping methods for detection of *Salmonella* enterica serovar Oranienburg outbreaks. *J Clin Microbiol* 2002;40:2057–2061.
3. Akiba T, Arai T, Ota T et al. Vertebral osteomyelitis and paravertebral abscess due to *Salmonella* Oranienburg in a child. *Pediatr Int* 2001;43:81–83.
4. Porcalla AR, Rodriguez WJ. Soft tissue and cartilage infection by *Salmonella* Oranienburg in a healthy girl. *South Med J* 2001;94:435–437.
5. Katsuno S, Ando H, Seo T et al. A case of retroperitoneal abscess caused by *Salmonella* Oranienburg. *J Pediatr Surg* 2003;38:1693–1695.
6. Taylor JL, Dwyer DM, Groves C et al. Simultaneous outbreak of *Salmonella* enteritidis and *Salmonella* schwarzengrund in a nursing home: Association of *S. enteritidis* with bacteremia and hospitalization. *J Infect Dis* 1993;167:781–782.
7. Choi M, Yoshikawa TT, Bridge J et al. *Salmonella* outbreak in a nursing home. *J Am Geriatr Soc* 1990;38:531–534.
8. Matsui T, Suzuki S, Takahashi H et al. *Salmonella* enteritidis outbreak associated with a school-lunch dessert: Cross-contamination and a long incubation period, Japan, 2001. *Epidemiol Infect* 2004;32:873–879.
9. Dryden MS, Keyworth N, Gabb R et al. Asymptomatic foodhandlers as the source of nosocomial salmonellosis. *J Hosp Infect* 1994;28:195–208.
10. Smith JL. Foodborne illness in the elderly. *J Food Protect* 1998;61:1229–1239.

## BODY WEIGHT–SUPPORTED TREADMILL IN THE PHYSICAL REHABILITATION OF SEVERELY DEMENTED SUBJECTS AFTER HIP FRACTURE: A CASE REPORT

*To the Editor:* Hip fracture (HF) is common in older individuals and often results in functional and walking disabili-

ties.<sup>1</sup> In HF patients, the prevalence of cognitive impairment is high, ranging from 31% to 88%, according to different studies.<sup>2</sup> Although recent evidence suggests that cognitive impairment is not per se a barrier to functional recovery,<sup>3</sup> the rehabilitation of HF patients with severe dementia remains a problem, associated with worse clinical and functional outcomes.<sup>4,5</sup>

This topic has recently been approached with the body weight–supported treadmill (BWST), a new “technique” that has been evaluated in the rehabilitation of patients with various clinical conditions but has never been attempted in subjects with severe dementia. BWST training involves stepping on a motorized treadmill while unloading a percentage of a person’s body weight using a counterweight harness system. Manual assistance is provided as necessary to promote upright posture and lower-extremity trajectories associated with human normal gait.<sup>6</sup>

The case of an 82-year-old woman with Alzheimer’s disease who underwent BWST rehabilitation after cemented arthroplasty for femoral neck fracture is reported here. The patient was admitted to the Rehabilitation and Aged Care Unit, “Ancelle della Carità” Hospital, Cremona, Italy, 4 days after surgical intervention. Severe anemia that required blood transfusions complicated the postsurgical course. The patient had been hypertensive for about 5 years and had been receiving galantamine 8 mg twice a day for 2 years. One month before fracture, her Barthel Index was 68/100, and her Mini-Mental State Examination (MMSE) score, as scored by a neurologist, was 9/30.

On admission, the patient was confused and agitated, trying continuously to get up from bed; her daughter reported that these symptoms, previously observed at home, worsened significantly after surgery. On clinical examination, the patient was hypokinetic, able to maintain balance when sitting but not while standing and walking. Blood pressure was normal (120/80 mmHg), and hemoglobin level was 11 g/dL. When a geriatric multidimensional assessment was administered her Barthel Index score was 4/100 and Tinetti scale 1/28,<sup>7</sup> denoting severe functional impairment. Pharmacological treatment for pain (paracetamol 500 mg three times per day) and deep venous thromboprophylaxis (nadroparin 0.4 mL per day) was continued according to orthopedic prescription.

During the first 4 days, the patient did not participate actively in rehabilitation; specifically, she did not respond to the team’s encouragement and was unable to maintain attention to external stimuli. From the 5th day, there was a slight clinical improvement, but although she accepted passive mobilization, she refused to stand up. On the 12th day, clinical conditions further improved, and her cognitive performance regained its prefracture status, with a MMSE score of 9/30, although she continued to be resistive to the physiotherapist encouragement, refusing to walk. Therefore, it was decided to change rehabilitative strategy, using the BWST. Since the first days of treatment, the patient seemed to enjoy BWST training, progressively increasing her endurance and the length of daily sessions in the following days. According to functional improvement, the body-weight suspension was progressively reduced. After the 18th day, she was able to walk for about 40 minutes daily on the treadmill without body-weight support. On the 29th day, she was able to get up autonomously from a chair,