

Short Communication

Long-Term Post-Salmonella Reactive Arthritis due to *Salmonella* Blockley

Ian G. Wilson* and Esme Whitehead¹

Northern Ireland Public Health Laboratory, Bacteriology Department, Belfast City Hospital, Belfast and
¹Rheumatology Department, Antrim Area Hospital, Antrim, UK

(Received March 12, 2004. Accepted May 10, 2004)

SUMMARY: We describe the case of a patient who became ill with *Salmonella* Blockley food poisoning while working in Cyprus in August 1994. As his diarrhea resolved he began to suffer from lower limb joint pains which were diagnosed as acute salmonella reactive arthritis. His condition deteriorated, then improved somewhat over a period of 2 years, but he continued to suffer symptoms over 5 years after infection. This case predates other reported cases of *S. Blockley* infection in Cyprus by 4 years. *S. Blockley* is associated with chickens, and the chicken meal is the probable source of his infection. This case is of interest since it demonstrates the emergence of the serovar outside Southeast Asia where it is common, and shows that information on the incidence and duration of reactive arthritis caused by serovars other than *S. Enteritidis* and *S. Typhimurium* is limited.

Reactive arthritis (RA), and Reiter's syndrome, a triad consisting of RA, urethritis, and conjunctivitis, are the most common causes of inflammatory polyarthritis in young men. Over two-thirds of such patients have the HLA-B27 genotype which is a predisposing factor (1) that may promote invasion of the intestinal epithelial cells and correlates with a poorer outcome (2,3). Genitourinary infection with *Chlamydia trachomatis* is the most common cause of RA, but pathogens causing enteric infections are also frequently responsible (4-6). In some patients, symptoms resolve within months, but in others they may persist for years. Information on the prevalence of RA after salmonellosis has been limited, but reports from outbreaks range from <1% (7) through 10% (8), reaching higher levels of 18 (9) and 29% (10) in certain studies.

Salmonella Blockley has been common in agriculture and clinical cases in Southeast Asia and is emerging in the Western world. The arthritogenicity of *Salmonella* serovars has been reported to be similar (8); however, our patient suffered long-term disability and there have not been enough cases reported to associate *S. Blockley* or other less common serovars with RA that is unusually persistent.

The patient was a fit male aged 20 years. While working in Cyprus in September 1994 he suffered from vomiting and severe diarrhea with no blood or mucus. He recounted having eaten a chicken meal the day before in a canteen run by his employer and had not recently eaten elsewhere. A soft fecal specimen yielded *Salmonella* which was sensitive to ciprofloxacin, amoxicillin, and tetracycline. The organism was not isolated from two subsequent specimens. Around 4 days after the onset of gastro-intestinal symptoms he began to develop pain and swelling in his toes and feet, spreading to his ankles, and was admitted to hospital. He was febrile, described no upper limb involvement, and found a wheelchair necessary for mobility. Straw-colored fluid was aspirated from his knee on multiple occasions and showed

no bacterial growth. After 2-4 weeks of illness he was transferred to a hospital in England. He was diagnosed and treated for acute salmonella RA. Initial treatment was symptomatic with anti-inflammatory drugs and intermittent steroid injections to the joints as required. The fecal isolate was identified as *S. Blockley* I 6,8:k:1,5 in November 1994, and the patient's tissue type was HLA B27. *C. trachomatis* infection was not detected. The seronegative arthritis continued, affecting mainly his feet and knees. After 15 and 18 months he was re-examined. Synovitis was found in both knees and there was tenderness, particularly in the second and third metatarsophalangeal (MTP) joints of the left foot. The right foot was less badly affected. Treatment was with sulfasalazine (salazosulfapyridine), an anti-inflammatory drug that is normally used in acute ongoing rheumatoid arthritis, the non-steroidal anti-inflammatory drug (NSAID), diclofenac, and the H₂ receptor antagonist, ranitidine. Twenty-one months after infection his condition had improved, he had less foot pain, sulfasalazine had been discontinued, and he could occasionally omit the NSAID without increasing pain. X-rays revealed erosive changes in the small toe joints of the left foot, and involvement of the sacroiliac joints. The patient suffered 6-8 episodes of anterior uveitis/iritis, beginning 4 years post-infection. Together with distal arthritis this indicates incomplete Reiter's syndrome which is common with post-*Salmonella* RA (11). The patient continued to experience pain and limited mobility, and was discharged by his employer on medical grounds 3 years after contracting the infection. Over 5 years after the infection he continued to suffer intermittent swelling and pain in his knee and swelling in his ankles and feet which suggests ongoing activity rather than damage from previous arthritis. There was continual pain and ongoing chronic deformity of the toes of the left foot which is likely to lead to further deterioration due to secondary osteoarthritic changes.

Environmental health inspections of the canteen premises were conducted. These revealed that the food storage, cooking, and dining areas suffered from long-standing problems of pest infestation, defective drains, temperature control, poor layout, and general disrepair. Six months before the patient was infected, environmental health inspectors had investi-

*Corresponding author: Mailing address: Northern Ireland Public Health Laboratory, Bacteriology Department, Belfast City Hospital, Lisburn Road, Belfast BT9 7AD, UK. Tel: +44-28-90263553, Fax: +44-28-90263991. E-mail: ian.wilson@bll.n-i.nhs.uk

gated foul odors from floor drains and identified numerous areas for improvement in the canteen run by his employer. No immediate cause was found but it was recognized that the condition of the drains breached regulations. A program of clearing, regular cleaning, and disinfestation was recommended, and follow-up inspections took place. The problems identified included deterioration of water purification equipment, holes giving access and harborage to pests, cockroach infestation, absence of fly screens on windows, excessive ambient air temperatures, and condensation in part of the kitchen. Eleven months after the illness the kitchen was judged to remain in a condition where a prohibition notice should be considered, despite some remedial treatments. There was no evidence that Hazard Analysis Critical Control Point (HACCP) was practised. The monitoring of cooking conditions and prevention of cross-contamination should have been used to control the risk of food-borne illness. Purchase records were not available to establish the country of origin of the chicken, so production in Southeast Asia where *S. Blockley* is common is only speculative and could not be confirmed.

S. Blockley was first isolated from animal feed and chicken feathers in Thailand in 1989 (12). Thailand is a major exporter of chicken products that are generally of high microbiological quality. The serovar has also been isolated in other countries in Southeast Asia, and more recently in Spain, Portugal, Greece, Cyprus, Germany, England and Wales, Austria, Belgium, Sweden, Finland, USA, and Canada (13).

This report identifies an early case of *S. Blockley* infection in Europe that had serious long-term arthritic sequelae. Hannu et al. (8) have suggested that there is little variation in the frequency of RA with different *Salmonella* serovars. Mäki-Ikola and Granfors (14) reviewed single and outbreak cases associated with various salmonellas and reported that 90% of arthritogenic serovars shared identical O antigens (groups B and D, including *S. Typhimurium* and *S. Enteritidis*). However, data are limited since large outbreaks are infrequent and most reports of post-salmonella RA involve *S. Enteritidis* or *S. Typhimurium* which are by far the dominant serovars in many countries. Clinicians should continue to be observant for the possibility that certain salmonellas may be associated with long-term disability since there is little evidence regarding less common serovars.

REFERENCES

1. Barth, W. F. and Segal, K. (1999): Reactive arthritis (Reiter's syndrome). *Am. Fam. Physician*, 60, 499-503, 507.
2. Leirisalo-Repo, M., Helenius, P., Hannu, T., Lehtinen, A., Kreula, J., Taavitsainen, M. and Koskimies, S. (1997): Long-term prognosis of reactive salmonella arthritis. *Ann. Rheum. Dis.*, 56, 516-520.
3. Ekman, P., Kirveskari, J. and Granfors, K. (2000): Modification of disease outcome in *Salmonella*-infected patients by HLA-B27. *Arthritis Rheum.*, 43, 1527-1534.
4. Thomson, G. T., Alfa, M., Orr, K., Thomson, B. R. and Olson, N. (1994): Serologic testing for reactive arthritis. *Clin. Invest. Med.*, 17, 212-217.
5. Mattila, L., Leirisalo-Repo, M., Pelkonen, P., Koskimies, S., Granfors, K. and Siitonen, A. (1998): Reactive arthritis following an outbreak of *Salmonella* Bovismorbificans infection. *J. Infect.*, 36, 289-295.
6. Kanakoudi-Tsakalidou, F., Pardalos, G., Pratsidou-Gertsis, P., Kansouzidou-Kanakoudi, A. and Tsangaropoulou-Stinga, H. (1998): Persistent or severe course of reactive arthritis following *Salmonella enteritidis* infection. A prospective study of 9 cases. *Scand. J. Rheumatol.*, 27, 431-434.
7. Urfer, E., Rossier, P., Mean, F., Krending, M. J., Burnens, A., Bille, J., Francioli, P. and Zwahlen, A. (2000): Outbreak of *Salmonella braenderup* gastroenteritis due to contaminated meat pies: clinical and molecular epidemiology. *Clin. Microbiol. Infect.*, 6, 536-542.
8. Hannu, T., Mattila, L., Siitonen, A. and Leirisalo-Repo, M. (2002): Reactive arthritis following an outbreak of *Salmonella typhimurium* phage type 193 infection. *Ann. Rheum. Dis.*, 61, 264-266.
9. Locht, H., Molbak, K. and Krogfelt, K. A. (2002): High frequency of reactive joint symptoms after an outbreak of *Salmonella enteritidis*. *J. Rheumatol.*, 29, 767-771.
10. Dworkin, M. S., Shoemaker, P. C., Goldoft, M. J. and Kobayashi, J. M. (2001): Reactive arthritis and Reiter's syndrome following an outbreak of gastroenteritis caused by *Salmonella enteritidis*. *Clin. Infect. Dis.*, 33, 1010-1014.
11. Samuel, M. P., Zwillich, S. H., Thomson, G. T., Alfa, M., Orr, K. B., Brittain, D. C., Miller, J. R. and Phillips, P. E. (1995): Fast food arthritis - a clinico-pathologic study of post-*Salmonella* reactive arthritis. *J. Rheumatol.*, 22, 1947-1952.
12. Bangtrakulnonth, A., Suthienkul, O., Kitjakara, A., Pornrungwong, S. and Siripanichgon, K. (1994): First isolation of *Salmonella blockley* in Thailand. *Southeast Asian J. Trop. Med. Public Health*, 25, 688-692.
13. Fisher, I. (2000): *Salmonella* in Europe - Enter-net report, April-June 2000. *Eurosurveillance Wkly.*, 4(7 September), 1-3.
14. Mäki-Ikola, O. and Granfors, K. (1992): *Salmonella*-triggered reactive arthritis. *Scand. J. Rheumatol.*, 21, 265-270.