

CASE REPORT

Reactive Arthritis Associated with *Shigella dysenteriae* type 1 Infection

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SUMMARY

Shigella dysenteriae type 1 causes the most severe form of bacillary dysentery. The spectrum of illness ranges from mild watery diarrhoea to severe bloody diarrhoea. Shigellosis is often associated with intestinal complications, including intestinal perforation, intestinal obstruction, toxic dilatation of the colon, and prolapse of the rectum; systemic complications include septicaemia, hyponatraemia, hypoglycaemia, seizure, encephalopathy, haemolytic-uraemic syndrome, and malnutrition. Arthritis and conjunctivitis are rare extra-intestinal complications of shigellosis. Annually, about 110,000 patients receive treatment in the Dhaka Hospital of the International Centre for Diarrhoeal Disease Research, Bangladesh for diarrhoea and diarrhoea-associated illnesses, of which 11% are due to shigellosis. However, arthritis associated with shigellosis has not been reported from this population. Arthritis has been reported in association with infection due to *S. flexneri* and *S. sonnei* from other places. We are unaware of any reported case of arthritis in association with *S. dysenteriae* type 1 infections. In this report, we describe the clinical and laboratory features of a young woman who developed arthritis following *S. dysenteriae* type 1 infection.

Key words: Dysentery, Bacillary; Arthritis; *Shigella dysenteriae*; *Shigella flexneri*; *Shigella sonnei*

CASE REPORT

A woman aged 16 years was admitted to the Dhaka Hospital of the ICDDR,B with a history of bloody and mucoid diarrhoea, fever, and anorexia for 15 days. She had noticed a progressive swelling of her left elbow joint 12 days after the onset of her illness (3 days before hospitalisation). On admission, she was not dehydrated and was mildly febrile (oral temperature 38 ° C). Her systemic examination did not reveal any abnormality, except a swollen left elbow joint that was red, hot, and painful, with both active and passive movements being restricted. Before reporting to the hospital, she had been treated with inadequate doses of ampicillin, amoxicillin and furazolidone. The day following admission, she developed a painful swelling of her right ankle joint with limitations of movements. On the 4th hospital day, her left knee was similarly affected (Fig. 1 and 2). She did not have any history of joint swelling or joint pain before.

After admission, patient was treated with oral ampicillin (500 mg every 6 hours) for 48 hours. Within 48 hours of her admission *S. dysenteriae* type 1 was isolated from her stool specimen. The isolate was susceptible to nalidixic acid and mecillinam, but resistant to ampicillin, amoxicillin, furazolidone, and trimethoprim-sulphamethoxazole, as determined by disc diffusion method (1). Accordingly, ampicillin was discontinued and nalidixic acid was started (1 g every 6 hours). In addition, acetyl salicylic acid was started orally in a dose of 300 mg every 6 hours. After 5 days of therapy the swelling of the affected joints regressed and the mobility improved.



Fig. 1: Shigella-associated arthritis involving right ankle joint

Table: Results of the laboratory tests	
Test	Result
Stool	
Nos. pus cells / HPF *	15-20
Nos. RBC / HPF	20-30
Ova, Parasite	Not found
Culture	<i>S. dysenteriae</i> 1
Haematology	
Haematocrit (%)	33
Total WBC/mm ³	14,000
Neutrophil	88 %
Lymphocyte	10%
Eosinophil	1%
Monocyte	1%
ESR (Wintrobe's) in 1st hour	18 mm
Serum	
ASO titre, IU	50
VDRL	Negative
Rheumatoid factor	Negative
Antinuclear antibody	Negative
Glucose (Random), mmol/L	6.3
Urea, mmol/L	1.4
Creatinine, mol/L	65
Protein, g/L	67
Na ⁺ , mmol/L	140
Cl ⁻ , mmol/L	102
K ⁺ , mmol/L	3.8
HCO ₃ ⁻ , mmol/L	26
Urine	
Protein, g/L	Trace
Nos. pus cell / HPF	8-10
Nos. RBC / HPF	1-2
Culture	No growth
Joint aspirate	
Pus cell/HPF	Occasional
Protein, g/L	39.4
Glucose, mmol/L	3.22
Culture	No growth

*HPF = high power field

Microscopic examination of three consecutive stool specimens did not reveal any ova or parasites. Other than mild anaemia, the haematological values were within normal limits (Table). The erythrocyte sedimentation rate (Wintrobe's method) was 18 mm in the first hour. The serum antistreptolysin O titre (ASO) was 50 IU, and rheumatoid arthritis (RA) factor and antinuclear antibody and VDRL tests were negative. Plasma glucose, and serum concentrations urea, creatinine, total protein, sodium, potassium, chloride, and bicarbonate were within normal limits. Trace amounts of albumin, a few pus cells, and erythrocytes were found on microscopic examination of the urine, but urine culture did not grow any organism. Chest radiograph was normal, and radiographs of her involved joints did not disclose any abnormality except soft tissue swelling. A left knee joint aspirate was straw-coloured, with normal protein and glucose concentrations. Microscopic examination of the joint aspirate showed occasional pus cells, and culture of the fluid did not grow any organisms. Colonoscopy demonstrated extensive exudation, focal areas of haemorrhages, and marked oedema of the colonic mucosa (Fig. 3) (2).



Fig. 2: Shigella-associated arthritis involving left knee joint. Notes the swelling (arrow)

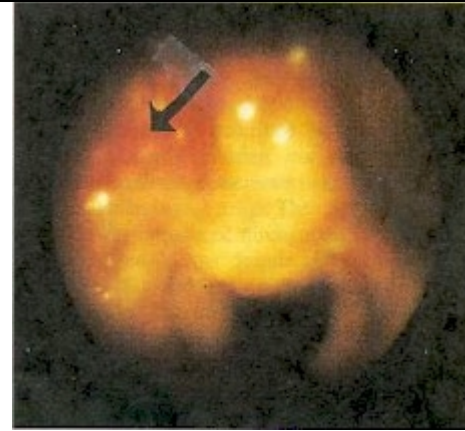


Fig. 3: Shigella-associated colitis with marked oedema and erythema (arrow)

DISCUSSION

Shigellosis is a major public health problem in developing countries (3). Among the diarrhoeal diseases, shigellosis is associated with a high death rate and is an important cause of malnutrition (4). Moreover, it is also associated with many complications that are not usually seen in other diarrhoeal diseases. Complications occur frequently with *S. dysentery* type 1 infection (5). Reactive arthritis, a rare complication of shigellosis, has been reported in association with *S. flexneri* and *S. sonnei* infections (6,7). This complication usually occurs on the second week of illness. However, to our knowledge this is the first case of arthritis seen in association with *S. dysentery* type 1 infection. The monoarticular or migratory arthritis in shigellosis usually affects large joints. It is characterised by sudden onset painful swelling of one or several joints. There is, however, no local redness or rise of temperature. The articular fluid is straw-coloured, without signs of bacterial infection. The joint fluid of this patient was similar to that described earlier with *S. sonnei* and *S. flexneri* infections. The affected joints in this patient were swollen, erythematous with a local rise in temperature. Reiter's syndrome may present with migratory joint pain, but conjunctivitis and urethritis are usually present (8). Both these signs were absent in this patient. Although the pathogenesis of arthritis in shigellosis remains unclear, it is considered to be reactive in nature. Why arthritis is seen with some serotypes of *Shigella* (arthritisogenic strains) and not with others is unclear. It has been suggested that structural similarities between host cells and *S. species* may trigger the process of reactive arthritis (9). This may also be true for *S. dysenteriae* type 1. It has also been suggested that *Shigella* endotoxin may trigger prostaglandin-E mediated synovial inflammation (10).

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