Erythema nodosum associated with Shigella colitis in a 7-year-old boy

There are only three reported cases of erythema nodosum being caused by Shigella infections in the literature and only one of these occurred in a pediatric patient. We report the first pediatric case of post-infective erythema nodosum due to Shigella flexneri in Europe and in the youngest known patient to date.

A 7-year-old boy was admitted with a five-day history of vomiting and watery diarrhea. Over the previous few days fresh blood and mucus was noted in the stool. The frequency of stool passage was 2–3 stools/hour and was associated with both perianal and abdominal pain. The rest of the family remained well and there was no history of recent travel, uncooked meat, or infectious contacts. The patient was an immunocompetent child who was growing and developing normally. There was history of fatigue but no fever.

He was afebrile and well hydrated with normal examination. Initial sodium was 131 mmol/l, potassium 3.7 mmol/l, urea 8.0 mmol/l, creatinine 58 μmol/l, and C-reactive protein 69 mg/l. The total white blood cell count was 5.35 × 10⁹/l, neutrophil count 3.28 × 10⁹/l with normal liver function tests and coagulation. Stool cultures were positive for Shigella flexneri.

Supportive management with oral rehydration fluid and analgesia commenced. Six days later, the patient complained of itchy eyes. However eye and joint examination were normal and he was discharged home on day six when abdominal pains had ceased.

On day 16, the family raised concerns regarding a rash on the extensor areas of both upper and lower limbs. Examination revealed florid erythema nodosum with discrete macular-papular, erythematous, warm and tender nodules. The nodules were bilaterally distributed ranging from 1 to 5 cm in diameter. They lasted a couple of weeks and were treated symptomatically with non-steroidal anti-inflammatory medication. They did not recur.

Shigella is a global human health problem particularly in developing countries. In Europe, children in day-care centers or of migrant families are most at risk. The predominant mode of transport is fecal—oral contact and low infectious inoculums (as few as 10 organisms) makes it highly contagious. The organism generally survives poorly in the environment.

S. flexneri is the hyperendemic species in developing countries and is responsible for approximately 10% of all diarrheal episodes among young children. The species is highly fragile and may be missed unless care is taken in collection and handling.

The infection commences with fever, fatigue, malaise, and anorexia and progresses to watery diarrhea before dysentery. Persistent diarrhea and malnutrition are the most common sequelae. A rare post-infectious complication seen mainly in adults is reactive inflammatory arthritis or in combination with conjunctivitis and urethritis (Reiter’s syndrome). Erythema nodosum has an acute onset, characterized by erythematous, tender, warm nodules, and raised plaques usually located on the shins, ankles, and knees. Initially nodules are bright red but within days become livid red or purplish and finally turn to yellow/green. The list of etiological factors is varied. Inflammatory bowel disease, Yersinia enterocolitica, Salmonella typhimurium, and Campylobacter jejuni gastroenteritis have all been described in an etiological relationship with the development of post-infective erythema nodosum. In this case the chronicologic correlation between the appearance of S. flexneri and that of erythema nodosum makes it likely that the two were etiologically related with no evidence of other precipitants present. Resolution is spontaneous within a few weeks and non-steroidal anti-inflammatory medication is helpful.

Shigella infection in the European pediatric population is uncommon. The species is fragile and this may explain why there is limited literature proposing the link between the infection and erythema nodosum. This case provides further evidence to support this association.

Conflict of interest: No conflict of interest to declare.

References

Food poisoning due to Jimson weed mimicking Bacillus cereus food intoxication in Austria, 2006

On 31 October 2006, a group of employees fell ill with vomiting and nausea within 2 hours of eating lunch in a factory canteen. All eight of these persons reportedly affected with gastrointestinal disorders were said to have consumed balls of millet-carrots (total number of vegetarian meals served that day: 8). One of the eight persons was said to have been hospitalized 12 hours after the incriminated meal because of hallucinations.

The local health authorities authorized AGES (the Austrian Agency for Health and Food Safety) to perform an epidemiological investigation into this cluster of suspected Bacillus cereus food intoxications. Bacillus cereus food intoxication is characterized by the sudden onset of nausea and vomiting or by colic and diarrhea. The first type is caused by a heat-stable emetic toxin, cereulide, and is produced in food when B. cereus levels reach $10^5$ colony-forming units/gram of food.$^1$ The incubation period ranges from 0.5 to 6 hours in cases where vomiting is the predominant symptom.

A questionnaire was designed to obtain demographic data and information on clinical signs and symptoms, onset and duration of illness, hospitalization, and outcome. Preliminary questioning revealed the already-known food exposure (based on a list of lunch meals pre-ordered by each of the 52 employees). Eight persons had consumed the incriminated vegetarian menu — the balls of millet-carrots, one serving (i.e., approx. 120 g) each. Seven of these people fell ill between 15 and 120 min (median 45 min) following consumption. The eighth person having consumed this vegetarian meal did not confirm the occurrence of any symptoms. The age of the seven patients ranged from 19 to 55 years (median 29 years), three patients were female. Six of the seven affected persons reported nausea (four of them with dry mouth), and five of these were among the six persons who sustained projectile emesis. A 29-year-old female patient having suffered from emesis but not from nausea also reported a globus feeling (the feeling of a lump in the throat). The 40-year-old employee, who suffered nausea with ‘inability to vomit’ (30 min following lunch), also reported abdominal cramps, vertigo, mydriasis, anxiety and brief unconsciousness, followed by auditory hallucinations which occurred in the very early hours of the morning of the following day (approximately 12 hours after the incident in the canteen). The patient’s husband observed this episode of ‘unconsciousness’. This particular patient was hospitalized and diagnosed with a suspected gastrointestinal infection; neurological symptoms were not visible. The patient was released the same day, after administration of intravenous fluids and sedatives. In all patients, symptoms ceased spontaneously within 24 hours (range 2–24 h; median 4 h).

On 2 November, leftovers from the balls of millet-carrots (approx. 120 g) and from the dough (approx. 200 g) were obtained for microbiological investigations. Both specimens tested negative for salmonella, campylobacter, Yersinia spp, Escherichia coli, Listeria spp, B. cereus and Clostridium perfringens. The balls yielded Staphylococcus aureus after enrichment only (isolate not available for testing for enterotoxin). Stool samples gained from six of the seven patients on 20 November, tested negative for salmonella, campylobacter, Shigella spp, Yersinia spp, enterohemorrhagic E. coli and norovirus. The millet left over from the preparation of the millet-carrots balls was provided for testing. Examination of the remaining 195.5 g whole millet grain at the AGES laboratory on 3 November revealed eight Datura stramonium (Jimson weed) seeds (i.e., 50 seeds/kg of grain).

The ingestion of Jimson weed, which contains the anticholinergics atropine, hyoscyamine and scopolamine, can cause serious illness or death.$^1$ Sporadic incidents of intentional misuse have been reported repeatedly, with the ingestion of 50 D. stramonium seeds being able to cause hallucinations for 36 hours in an 18-year-old.$^2$–$^4$ Assuming an ingestion of 120 g (i.e., including approx. 60 g millet) per patient case in the current incident, the average intake would have been three D. stramonium seeds per person. One hundred seeds contain approximately 6 mg of atropine.$^2$ A dose of atropine exceeding 10 mg is regarded as potentially lethal.$^2$

The symptoms of tropane alkaloid toxicity typically occur 5–30 min after ingestion: dry mouth, hot red skin, mydriasis and blurred vision, tachycardia, urinary retention, ataxia, speech disturbance, disorientation, and visual hallucinations.$^5$ In Slovenia in 2003, contamination of buckwheat flour with 190 D. stramonium seeds/kg of grain recently caused mass poisoning with these typical symptoms.$^6$ A dose of only three D. stramonium seeds per serving (as assumed in the current cluster) is rather small to cause severe toxicity in an otherwise healthy adult. Nausea and particularly vomiting were the two dominant symptoms in the Austrian food poisoning cluster; scopolamine, especially, has an antiemetic effect, but there are literature references distinctly citing nausea as the dominant symptom of tropane alkaloid toxicity (intentional misuse of Brugmansia spp.).$^7$ A time-lag of 12 hours between lunch intake and clinical onset of unconsciousness and auditory...