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 Bacillus cereus levels reach $10^5$ colony-forming units/gram of food.\footnote{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.\footnote{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.\footnote{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.\footnote{2} A dose of atropine exceeding 10 mg is regarded as potentially lethal.\footnote{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.\footnote{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.\footnote{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).\footnote{5,7} A time-lag of 12 hours between lunch intake and clinical onset of unconsciousness and auditory

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hallucinations is unusual for intoxication with atropine or scopolamine, but could be explained by delayed digestion of non-ground Jimson weed seeds. Postprandial 'inability to vomit', followed by unconsciousness and auditory hallucinations, as reported by this patient, clearly is consistent with tropane alkaloid poisoning, and, together with laboratory results (50 seeds D. stramonium/kg of grain), confirm contamination by Jimson weed to be the cause of this event.

Foodborne disease outbreaks are recognized by the occurrence of illness within a variable but usually short time period after a meal, among individuals who have consumed foods in common. Prompt and thorough laboratory evaluation of cases and implicated foods is essential. Food poisoning due to Jimson weed may mimic B. cereus food intoxication and therefore should be considered as a differential diagnosis. The increasing propagation of organic farming with the refusal to use pesticides may increase the occurrence of food poisoning due to Jimson weed in the future.

Conflicts of interest: No conflict of interest to declare.

References


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**Antimicrobial resistance among urinary tract Escherichia coli isolates from inpatients and outpatients in a tertiary care center in São Paulo, Brazil**

Urinary tract infections (UTIs) having pathogenic Escherichia coli as the etiologic agent, remain a common and troublesome health problem in many countries, resulting in considerable morbidity and costs. Non-complicated infections, particularly in women, account for the highest number of UTIs. Women diagnosed with acute uncomplicated cystitis are usually treated as outpatients; the microbiologic characteristics of this infection are highly predictable even in otherwise healthy subjects. Physicians have therefore been advised that empirical antimicrobial treatment not requiring culture is appropriate in such cases. This empiric therapy has been widely employed and fewer UTI germs are now routinely cultured. However, increasing antibiotic resistance of uropathogens causing both community- and nosocomially-acquired UTIs has been clearly demonstrated.

Different levels of population treatment exist within the health system in Brazil. ‘Primary care’ takes place at the municipal health center (essentially a doctor’s office), ‘secondary care’ is performed at the municipal hospitals, and the ‘tertiary care’ system essentially takes place at university teaching hospitals. Within these systems, updated knowledge of causal bacteria and their susceptibility patterns is important for the proper selection and use of antibiotics, as well as for an appropriate prescribing policy. We conducted a study to verify the antimicrobial resistance of E. coli among UTI isolates from the ‘primary care’ and ‘tertiary care’ systems in Ribeirão Preto, São Paulo, Brazil.

The antimicrobial resistance profile infection data obtained from the Clinical Hospital of the School of Medicine of Ribeirão Preto (HCFMRP), a university teaching hospital, and from municipal health centers, concerning E. coli isolated from UTI patients, were monitored and analyzed. Isolates were collected between July 2000 and July 2003. A total of 67 strains of E. coli isolated from HCFMRP and 78 strains from the municipal health centers were analyzed. The isolation and identification of E. coli strains was performed by minimal standard bacteriological tests using conventional biochemical markers; one isolate per patient was evaluated. Antimicrobial susceptibility was determined by the Kirby–Bauer disk diffusion method following the definitions of the National Committee for Clinical Laboratory Standards (NCCLS) for agar diffusion tests using antibiotic-containing disks (CEFAR Diagnostica Ltd, São Paulo, Brazil). Quality control was performed using E. coli ATCC 25922.

Tests on the susceptibility of E. coli isolates to antimicrobial drugs showed that the highest rates of resistance were found among those from the hospital patients, with resistances at least twice as high as those of the isolates...