

Invasive listeriosis in Southern Switzerland: a local problem that is actually global

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Background *Listeria monocytogenes* is primarily transmitted through consumption of contaminated food. Though invasive listeriosis is rare, symptoms are typically severe with bacteriemia and meningitis leading to a mortality > 30%, especially in immunocompromised individuals.

Methods We describe here an outbreak of invasive *Listeria monocytogenes* infections in Ticino region, a small canton of approximately 350.000 inhabitants located in the South of Switzerland, close to the Italian border. This area is served by four main hospitals located in Lugano, Bellinzona, Mendrisio and Locarno. In this context, we observed 6 cases of invasive listeriosis hospitalized from July to September 2022: one epidural abscess, one bacteraemia and 4 meningitis.

Results Table 1 describes demographic and clinical characteristics of the patients. Though most subjects had several co-morbidities, only one received chronic immune-suppressive treatment for a previous kidney transplantation. Tests on *Listeria monocytogenes* specimens showed that 4 patients had serotype 4b (3 meningitis and one epidural abscess) and 2 had serotipe 1/2b, suggesting that the cases had at least two different origins. Some weeks before this outbreak, a similar event occurred in Italy; two patients, both infected with serotype 4b, revealed that they had bought fresh cheese in Italy from the same grocery store. No significant exposure for other patients was identified; they denied assumption of cheese or pork derivates in the weeks before hospitalization and co-habitants did not refer symptoms possibly correlated with listeriosis. Antibiotic treatment with amoxicillin and gentamycin was highly effective and no death was observed. Only one patient stopped gentamycin prematurely due to acute kidney failure.



Evolution of subdural empyema by *Listeria monocytogenes* (patient 3)

- The patient did not experience a relapse of symptoms or signs of infection at follow-up visits, until six months after stopping antibiotic treatment.
- C-reactive protein normalized during out-patient follow-up, as renal and liver tests.
- MRI showed a complete resolution of spondylodiscitis findings at the end of treatment.

Table 1: Demographic and clinical characteristics of patients with invasive listeriosis diagnosed between July - September 2022.

	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6
Gender	M	M	M	F	M	M
Age	73	73	69	68	78	82
Co-morbidities	Cardiac failure Diabetes Anemia Liver failure Chronic renal failure	Coronaropathy Atrial fibrillation Chronic renal failure with dyalisis	Cardiac failure Atrial fibrillation COPD	Atrial fibrillation Kidney transplantation COPD	Coronaropathy Lung cancer	Cardiac amyloidosis
Clinical diagnosis	Bacteremia	Meningitis	Subdural empyema	Meningitis and colecystitis	Meningitis	Meningitis
Serotype	4b	1/2b	4b	4b	4b	1/2b
Cause of contagion	Unknown	Unknown	Contaminated cheese from Italy	Contaminated cheese from Italy	Unknown	Unknown
Treatment, duration	Amoxicillin + Gentamycin, 21 days (gentamycin stopped after 4 days for acute kidney failure)	Amoxicillin + Gentamycin, 14 days	Amoxicillin + Gentamycin for 2 weeks; then Amoxicillin + TMP/SMX for 4 weeks; then Amoxicillin for 6 weeks	Amoxicillin + Gentamycin for 2 weeks; then Amoxicillin for 4 weeks	Amoxicillin + Gentamycin for 2 weeks; then Amoxicillin for 4 weeks	Amoxicillin + Gentamycin for 2 weeks; then Amoxicillin for 4 weeks
Outcome	Alive	Alive	Alive	Alive	Alive	Alive

Conclusions Sporadic outbreak of *Listeria monocytogenes* are periodically reported. A more effective tracking of the products could be implemented and a thorough analysis of each patient’s environment should be carried out, especially when the cases occurred in border regions. Microbiological assessment of the likely involved food could be scheduled as soon as one case is reported. This intervention, together with a detailed questioning should be performed to identify any possible source of infection. Epidemiological studies should be carried out as most accurately as possible and, finally, the joint effort between local microbiological laboratories and hospitals could be mandatory to better deal with new outbreaks. A cooperative intervention also between different Countries should be performed for these events.