Correspondence

Bifidobacterium Species Bacteremia: Risk Factors in Adults and Infants

To the Editor—We read with great interest the article by Bertelli et al [1], which reported 2 cases of *Bifidobacterium* species bacteremia in newborns receiving probiotics. Recently, we managed an adult case of *Bifidobacterium longum* bacteremia in a 74-year-old man treated by chemotherapy, hormonotherapy, and radiotherapy for an active polymetastatic prostatic adenocarcinoma. He had a medical history of diabetes mellitus and obesity (body mass index of 32 kg/m^2). He was admitted to our hospital for anorexia and spasmodic abdominal pain of 1 month. His temperature was 39°C, and physical examination revealed no abnormalities. Laboratory findings were C-reactive protein 166 mg/L, and white blood cell count of 5 Giga/L. Blood cultures grew *B. longum*. The identification was performed using matrix-assisted laser desorption-ionization–time of flight mass spectrometry (MALDI-TOF MS) (Bruker Daltonik Bremen, Germany) with a score >2. Our patient did not report any probiotic treatment or excessive consumption of dairy products. A treatment with intravenous amoxicillin-clavulanic acid 1000 mg 3 times daily was given for 15 days with a good outcome.

To deal with this emerging species, we performed a literature review up to March 2015 using the PubMed database, retrieving only 21 cases of human bacteremia due to *Bifidobacterium* species [1–8]. These cases are summarized in Table 1. The species most frequently reported were *B. longum* and *Bifidobacterium eriksonii* reclassified as *Bifidobacterium dentium* [9]. Most cases had abdominal symptoms as reported in our case. As described in Table 1, *Bifidobacterium* species grew from blood cultures in 1–10 days. Among these 22 cases, including ours, 7 were pediatric cases [1, 5–7]. All received probiotics to prevent necrotizing enterocolitis, as reported by Bertelli et al [1]. In preterm infants, *Bifidobacterium* species bacteremia is therefore related to the administration of probiotics, as strains from blood and probiotics have been found to be genetically similar [1].

By contrast, in adults, the role of probiotic administration remains largely unknown. Indeed, in our review, none of the reports described the use of probiotics in the 15 adult cases (Table 1). Nonetheless, 5 patients were immunocompromised (prostatic cancer, n = 2; rectal cancer, n = 1; systematic lupus erythematous, n = 2), and 4 cases were related to pregnancy (3 occurring postpartum, 1 during pregnancy). Prognosis of treated *Bifidobacterium* species infections is usually good (Table 1), and 16 of 22 patients recovered (73%).

Bifidobacterium species bacteremia seems to be a rare event, but its true incidence could be underestimated. Indeed, *Bifidobacterium* species could be considered as nonpathogenic bacteria, as these anaerobic, nonsporulating, gram-positive rods are part of the physiological oral, vaginal, and intestinal flora. Besides bacteremia, urinary, pleuropulmonary, obstetric, and gynecologic infections and dental caries have been reported [9]. Traditional culture techniques for the detection, quantification, and identification of *Bifidobacterium* species are now being complemented by MALDI-TOF MS and molecular techniques [10], improving detection and diagnosis of these bacteria. Bacteremia due to *Bifidobacterium* species is an emerging entity, and the role of probiotics should be better investigated in cases occurring in adults, as already studied in preterm infants.

Note

Potential conflicts of interest. All authors: No reported conflicts.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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Table 1. Characteristics of Published Cases of *Bifidobacterium* Species Bacteremia

Reference	Sex, Age, y, Underlying Conditions	Clinical Description	*Bifidobacterium* Species	Delay of Isolation in Blood Cultures	Treatment	Outcome	Probiotic Use
[1]	F, 0, low birthweight, prematurity	Sepsis and ileus (3 episodes)	*B. infantis*	NA	Ceftazidime, vancomycin 7 d then imipenem 7 d	Recovered, surgical resection (intestinal necrosis)	Yes
	F, 0, low birthweight, prematurity	Septic shock, coagulopathy, ileus	*B. infantis*	NA	Ceftazidime, amikacin, metronidazole	Recovered, surgical resection (intestinal necrosis, jejunal perforation)	Yes
[2]	M, 41, none	Urinary infection	*B. adolescentis*	NA	Chloramphenicol 10 d	Recovered	NA
[3]	F, 19, recent partial laminectomy	Fever, chills, vomiting, diarrhea, and hepatomegaly	*B. longum*	2 d	Ticarcillin, metronidazole	Recovered	NA
[4]	NA, prostate cancer	Transient bacteremia secondary to ileal resection	*B. breve*	NA	NA	NA	NA
	NA, decubitus ulcer, frequent urinary tract infections	NA	*B. breve*	NA	NA	NA	NA
	NA	Peritonitis	*B. breve*	NA	NA	NA	NA
[5]	F, 0, low birthweight, prematurity, omphalocele	Post–omphalocele surgery, bilious gastric fluid	*B. breve*	4 d	Ampicillin-sulbactam, meropenem	Recovered	Yes
[6]	ND, 0, low birthweight, prematurity	Sepsis, distended abdomen	*B. infantis, B. longum*	3 d	Cefotaxime, vancomycin	Recovered	Yes
[7]	F, 0, prematurity, respiratory assistance first days	Periumbilical redness with pus then marbled, pale skin and distended abdomen	*B. longum*	3 d	Flucloxacillin, gentamicin	Recovered	Yes
	M, 0, prematurity, respiratory assistance first days	Suspected nosocomial infection	*B. longum*	3 d	Amoxicillin, gentamicin	Recovered	Yes
	F, 0, prematurity, respiratory assistance first days	Acute necrotizing enterocolitis	*B. longum*	3 d	Amoxicillin-clavulanic acid, gentamicin	Complications post– surgical resection requiring serial laparotomy	Yes
[8]	F, 24, none	Delivery, fever	*Bifidobacterium* spp	3–5 d of incubation	None	Recovered	NA
	M, 58, rectal cancer	Bowel obstruction, chills without fever	*B. eriksonii*	3–5 d of incubation	Ampicillin, kanamycin, cephalothin	Died	NA
	F, 39, none	Cholecystectomy, fever at day 1	*B. eriksonii*	3–5 d of incubation	None	Recovered	NA
	F, 35, none	Uterine fibroid section, fever	*B. eriksonii*	3–5 d of incubation	Ampicillin	Recovered	NA
	F, 29, none	Postpartum, septic shock, chills, and fever	*B. eriksonii*	3–5 d of incubation	Ampicillin, kanamycin	Recovered	NA
	F, 21, none	Pregnancy, chills, and fever	*B. eriksonii*	3–5 d of incubation	Ampicillin, kanamycin	Recovered	NA
	F, 31, none	Postpartum, fever at day 2	*Bifidobacterium* spp	3–5 d of incubation	Ampicillin, gentamicin	Recovered	NA
	F, 34, SLE	Multiple staphylococcal abscesses, subacute endocarditis	*Bifidobacterium* spp	3–5 d of incubation	Oxacillin	Recovered	NA
	F, 60, SLE	Peritonitis due to diverticulosis, fever	*B. adolescentis*	3–5 d of incubation	Ampicillin, gentamicin, cephalothin	Died	NA
Present case	M, 74, prostate cancer with colorectal invasion, diabetes mellitus	Fever, abdominal pain	*B. longum*	26 h	Amoxicillin-clavulanic acid	Recovered	No

Abbreviations: NA, not available; ND, not disclosed; SLE, systematic lupus erythematous.

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