Case Report

Septicemia: As a result of erroneous parenteral administration of probiotic

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ABSTRACT

Probiotics are formulations of live microbial cells that are administered orally to contribute to intestinal microbial balance. *Bacillus clausii* is one such aerobic, spore-forming bacterium that is able to survive in the acidic environment of the stomach and is used as a probiotic. In the past few years, probiotic use has increased to a greater extent. However, there is growing global evidence that the use of probiotics in patients with organ failure, the immunocompromised state can cause infections, but it is extremely rare in immunocompetent persons when given through peroral route. However, it can cause severe sepsis in even immunocompetent individuals when given intravenously inadvertently. This case report shows the importance of establishing safety guidelines for probiotic use and particularly for dispensing probiotics in liquid formulations.

Key words: *Bacillus clausii*, Parenteral, Probiotics, Septicemia

CASE REPORT

A 4-year-old male child presented to the pediatric emergency department of our hospital with complaints of generalized body swelling, high-grade fever, acute vomiting (multiple episodes), and lethargy for the past 2 days. There was a history of fever and loose stools 4 days back and was managed by oral rehydration solutions and oral antibiotics by the medical practitioner elsewhere. On day 3rd of the illness, the parents noticed frank blood in stool and took the child to a nearby hospital where he was treated with IV fluids, vitamin K, and probiotics.

On admission, the patient was tachypneic with a respiratory rate of 42 breaths/min, heart rate of around 112 beats/min, and blood pressure recorded from the right upper limb was 76/50 mm Hg which was less than the third centile.

On detailed history, the parents revealed accidental IV administration of probiotic suspension (Fig. 1a) containing 2 billion spores of *B. clausii* in 5 ml by paramedical staff (Fig. 1b). High-grade fever, vomiting, and generalized edema started on the 4th day of illness, and the patient was brought to our hospital. Baseline investigations were repeated on admission, which showed a drastic change from reports done before this accidental administration of probiotics. Along with the drastic rise in total leucocyte count, there was a fall in Hb, platelet counts, and the associated rise in C-reactive protein (CRP) (Q) was noted along with mildly increased serum glutamic pyruvic transaminase to 60 U/L (Table 1). Ultrasound whole abdomen revealed mild gallbladder wall edema and cortical echogenicity of the kidney.
Before IV probiotic administration reported an accidental IV probiotic injection overall and first in the pediatric demographic. To our greatest knowledge, this is the second reported case of sepsis caused by IV probiotics. Previous reports also confirmed sepsis caused by IV probiotics. A serious challenge in treating B. clausii sepsis is due to the limited therapeutic options as it is known to carry multiple drug-resistant genes. Initiation of an appropriate antibiotic inadequate dosage was another positive aspect of our case which resulted in better patient outcome. This emphasizes the importance of thorough knowledge of resistance patterns in handling infections caused by exotic/unusual organisms. As good bacteria carry drug-resistant genes, they can turn dangerous in some situations, due to which they might not respond to the primary line therapy that necessitates the use of high-end antibiotic therapy. Bacterial strains used as probiotics can become virulent and establish themselves as pathogens in some situations. Further, research is necessary on this issue as the mechanism of virulence of these bacterial strains remains questionable, especially in normal individuals. Here in this case, in spite of highly positive CRP values suggesting sepsis, the blood culture came out to be sterile as the patient received antibiotics before the sample was sent for culture. A drastic change in CRP quantitative values within a day is more in favor of probiotic administration-related septicemia.

CONCLUSION

Although probiotics are shown to profit the majority of patients on treatment, the risks may outweigh the advantages in immunosuppressed cases as evident in the literature. To date, there is insufficient standardization of safety and administration protocols for probiotics. Due to the paucity of data regarding the mechanism through which probiotics act, appropriate administrative regimens, and probiotic interaction, this issue continues to thrive among scientists around the world. This responsibility should be concomitant with the establishment of the latest safety standards in this area. This case report can, thus, be taken as a warning call for creating judicious use of probiotics and special measures should be taken in dispensing probiotics in liquid formulations to avoid accidental IV administration.

REFERENCES


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