

Case Report

Rare case report of accidental intravenous injection of oral probiotic

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ABSTRACT

Oral probiotics containing spores of *Bacillus clausii* are given to the patients who have undergone major surgery or are on long term antibiotic course, to restore intestinal microbial flora. We are reporting a rare case where the oral probiotic suspension was injected intravenously by mistake. We shall be discussing in detail the reactionary changes caused by erroneous injection of oral probiotics in the body, its effects, complications and treatment of the reactionary changes.

Keywords: Probiotic, *Bacillus clausii*, Reactionary change

INTRODUCTION

Spores of *Bacillus clausii* are used as probiotics mainly because of their antimicrobial and immune-modulatory properties.¹ They are prescribed to patients who need long hospital stay after a major surgery to restore equilibrium of intestinal flora which might have been changed during the course of antibiotics.¹ Probiotics also play a crucial role in boosting immunity and reducing the healing time. *Bacillus clausii* is available as 5 ml oral suspension, containing 2 billion spores.²

CASE REPORT

A 14-year-old boy presented with left sided nasal block for one month. On computerized tomography (CT), a mass was seen filling the left maxillary sinus. Endoscopic total maxillectomy for excision of mass with reconstruction using temporalis muscle myofascial flap was performed under general anesthesia. Post-operative period was uneventful and histopathology was reported as osteofibroma with all margins free of tumor. Patient was discharged on seventh post-operative day with a well healing flap and a total leukocyte count (TLC) of 6600 per cubic millimeter. The same evening, the patient was brought to casualty with complaints of shivering, vomiting and fever of 101 Fahrenheit (F). On examination, the

operative site was healthy with no signs of local infection. On further probing, it was found that the oral probiotic prescribed to patient on discharge, was erroneously administered intravenously by a local nurse.

The patient was admitted, and injectable corticosteroid was started as emergency treatment. While his vitals were stable, his blood workup showed a TLC of 38,600/mm³. He was immediately shifted to Intensive care unit and injectable broad-spectrum antibiotics were started. Repeat blood samples showed a rise in TLC to 46,600 mm³. Over the course of treatment, fever and TLC charts were maintained as shown in Figure 1 and Table 1. Injection cefoperazone and sulbactam 1.5 gram, and teicoplanin 400 milligram were administered for the first 2 days and then teicoplanin 400 mg for the next 7 days.

Blood culture came positive for *Bacillus clausii* which was identified on MALDI-ToF (Figure 3). Two cultures were drawn for each collection from two separate insertion sites. This was done to distinguish true blood stream infection (both specimens will be positive with the same organism) vs positive results from contamination (only one specimen will be positive).³ We sent total 7 sets (14 samples) of blood culture out of which 5 were positive for the *Bacillus clausii* and the last 2 sample were negative, where no colonies were grown on agar medium.

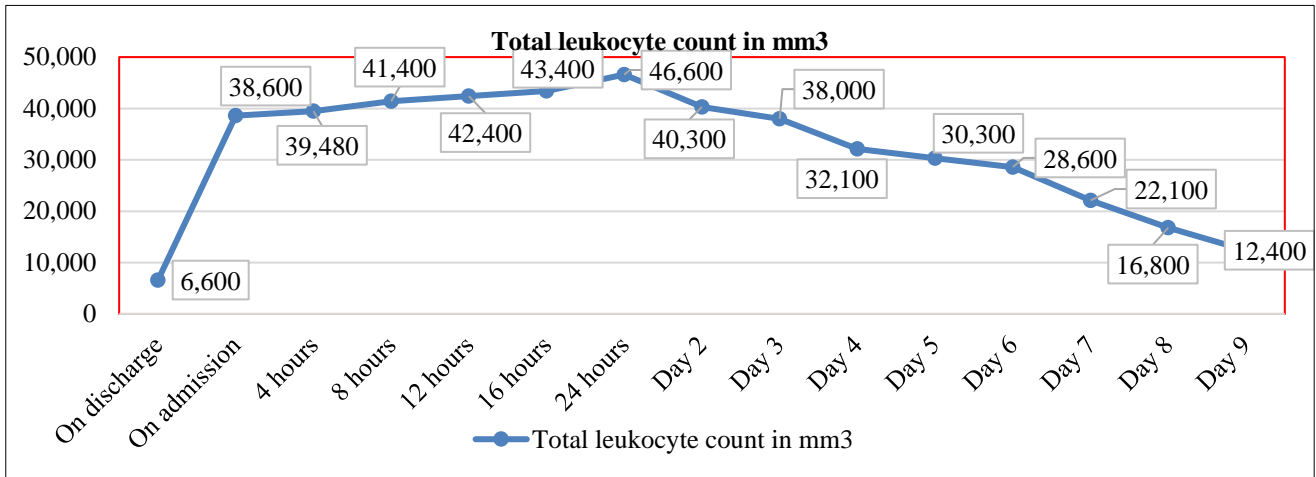


Figure 1: TLC trend over course of admission.

Table 1: TLC from admission onwards.

On discharge	On admission	4 hours	8 hours	12 hours	16 hours	24 hours	Day 6	Day 7	Day 8	Day 9
6,600	38,600	39,480	41,400	42,400	43,400	46,600	28,600	22,100	16,800	12,400

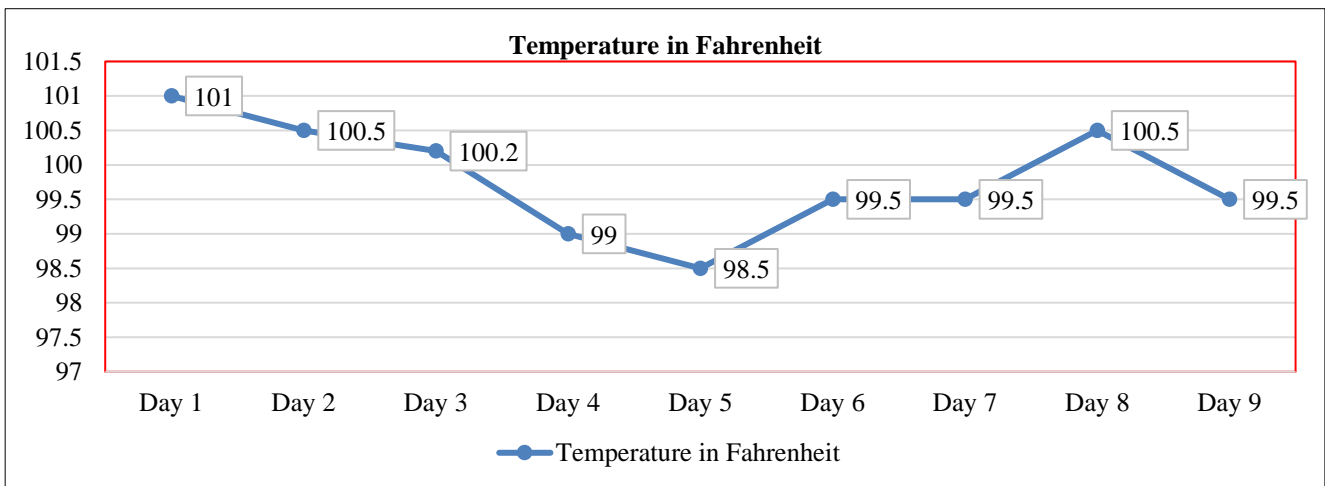


Figure 2: Temperature trend over course of admission.

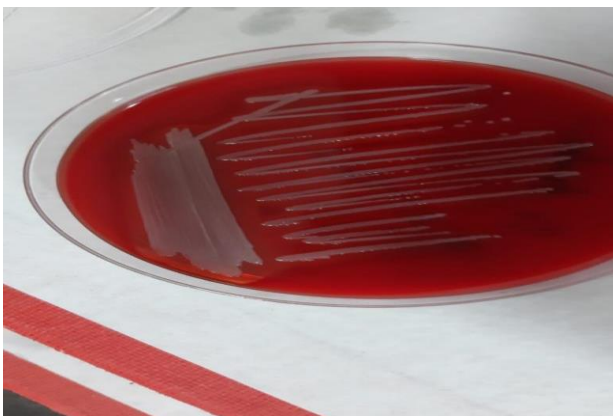


Figure 3: MALDI-ToF culture plate showing colonies of *Bacillus clausii*.

Other investigations like arterial blood gas (ABG), HRCT thorax and abdomen were found to be normal. Contrast enhanced CT face showed no signs of infective foci in the surgical field and flap. Parenteral antibiotics were continued for 9 days followed by oral antibiotics (tab ciprofloxacin) till 2 consecutive reports of blood culture came negative for *Bacillus clausii*.

DISCUSSION

Bacillus clausii are rod-shaped motile spore forming bacterium that when ingested survive in acidic medium of stomach, and colonize in the large intestine even in presence of antibiotics.⁴ The probiotic preparation, Enterogermina consists of a mixture of spores of four antibiotics resistant *Bacillus clausii* strains.⁴ These if

administered intravenously may disturb homeostasis of the body.

Till date, only 18 cases of erroneous intravenous injection of probiotics have been reported all over the world. Amongst these, 2 cases were of anaphylaxis, 2 of hypotensive reaction and 2 of respiratory distress. No case of fatality has been recorded yet in literature due to erroneous iv administration.² In our case there was no anaphylactic reaction seen despite rapid rise in total leukocyte count.

Antibiotic cefoperazone and sulbactam is a broad-spectrum antibiotic that covers both gram positive and gram-negative bacteria.⁵ The antibiotic teicoplanin is specifically used against gram positive bacteria.⁶ As our blood culture, showed growth of only gram positive bacteria we stopped cefoperazone and sulbactam and continued with teicoplanin alone. Other antibiotics that used were ciprofloxacin and vancomycin, which are also susceptible against gram positive bacilli.

CONCLUSION

After detailed monitoring we could not find that there was any morbid change seen in our patient after administering probiotic intravenously. Only change was seen in blood culture and TLC. This is the first case to be reported from India of injecting oral suspension probiotic intravenously with our best knowledge.

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REFERENCES

1. Lee NK, Kim WS, Paik HD. Bacillus strains as human probiotics: characterization, safety, microbiome, and probiotic carrier. Food Sci Biotechnol. 2019;28(5):1297-305.
2. Monnerat N, Lambert AC, Genné D. What happens after an accidental intravenous probiotic injection? Clin Microbiol Infect. 2020;26(4):517-8.
3. Isaacman DJ, Karasic RB, Reynolds EA, Kost SI. Effect of number of blood cultures and volume of blood on detection of bacteremia in children. J Pediatr. 1996;128(2):190-5.
4. Ghelardi E, Celandroni F, Salvetti S, Gueye SA, Lupetti A, Senesi S. Survival and persistence of Bacillus clausii in the human gastrointestinal tract following oral administration as spore-based probiotic formulation. J Appl Microbiol. 2015;119(2):552-9.
5. Ku Y-H, Yu W-L. Cefoperazone/sulbactam: New composites against multiresistant gram negative bacteria? Infect Genet Evol. 2021;88:104707.
6. Shea KW, Cunha BA. Teicoplanin. Med Clin North Am. 1995;79(4):833-44.

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