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Very Rare Gastrointestinal Anthrax in a Pregnant Woman

AQ1 *Alireza Akrami, Msc,* Mostafa Laale Dolatabad, MD,* Fatemeh Tashrifi, Msc,* Abdolmajid Gholizadeh, PhD,† and Bagher Moradi, PhD‡*

Abstract: Anthrax is an acute infectious disease caused by *Bacillus anthracic*. Gastrointestinal anthrax is considered as a rare condition in pregnancy, and there are few reports describing its complication and treatment procedure. Meanwhile, there is no article reporting successful treatment of a pregnant woman; however, we have reported a successful treatment of gastrointestinal anthrax in a pregnant woman. In this study, we reported a 38-year-old pregnant woman who was referred to the hospital with abdominal pain and persistent hemorrhagic diarrhea. Suzerain operation was also used, and laparotomy showed necrotic gangrene in colon. After the first surgery, the patient showed left lower quadrant abdominal pain (left lower quadrant collection), and drainage was performed during the second surgery. Finally, after 20 days, the patient was recovered and discharged from the hospital in a very good condition. Gastrointestinal anthrax during pregnancy is a very rare condition. In this study, we reported a patient with gastrointestinal anthrax who was recovered by a suitable treatment.

Key Words: anthrax, intestines, women, *Bacillus anthracis*

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Anthrax is an infectious disease described as a zoonotic infection and can affect humans in contact with livestock and contaminated products.[1] *Bacillus anthracis* bacteria produce spores after maximum growth, transmitted through dermal contact, inhalation, as well as eating milk and meat polluted with spores.[2] Since anthrax can be seen more commonly in farmers and ranchers than others, it is considered as an occupational disease.[3] Anthrax has 3 forms of illness, including cutaneous, respiratory, and intestinal anthrax, which have 95%, 5%, and 1% prevalence, respectively.[4] Because of the immune system being weakened during pregnancy, anthrax may endanger the health of pregnant women and their children. Therefore, anthrax in the pregnancy period needs a special strategy in diagnosis and treatment.[5] Maternal and neonatal complications have also been reported after bacterial infection,[6] so that the diagnosis is made based on the patient's history, clinical findings, and microscopic examination. In the cutaneous type, it is performed according to the clinical evaluation and microscopic examinations. Cutaneous anthrax has been reported more than other forms, which bolds via surrounding edema and necrotic-black pustules. These sores are seen almost in the hands and face, which could be treated with antibiotics.[7] The symptoms of respiratory anthrax in pregnant women are not known yet, and only a few studies have reported respiratory anthrax form based on the autopsy findings, and unfortunately, its treatment is impossible.[5] Moreover, there are even fewer studies related to gastrointestinal anthrax in pregnant women. This form of anthrax has symptoms, such as vomiting and hemorrhagic diarrhea, and its treatment is challenging, and there is no successful treatment.[8] However, in this study, we reported the first pregnant woman affected by gastrointestinal anthrax who received successful treatment.

CASE REPORT

The patient was a 38-year-old pregnant woman who was referred to the hospital emergency with abdominal pain, cramps, and hemorrhagic diarrhea. After examining the patient's history, it was revealed that she had eaten the undercooked sheep liver 4 days ago. Physical examination showed that the temperature was 36.5°C, blood pressure was 10/60 mm Hg, and heart rate was 90, so the patient received supportive treatment, but the primary symptoms persisted yet. Then, hematology tests showed WBC, HGB, PLT, and FDP values as 18.400, 13.7, 136,000, **AQ2** and 2750, respectively. Accordingly, these indexes can be considered as abnormal results. Because of continued abdominal pain, sonography was done, and it was cleared that there were severe ascites on the lower left side of abdominal tract. The fetus was also investigated by sonography, and the results were as follows: normal amount of amniotic, 28-week-old fetus without a heart rate, and the fetal weight of 1327 g. After the diagnosis of early intrauterine fetal death, Suzerain operation and laparotomy were performed. During surgery, necrotic gangrene in the colon was detected. To confirmation of diagnosis, culture and gram stain examination were done and gram positive bacilli, *B. anthraces*, was isolated and identified by gram staining. However, a few days after the necrotic tissue debridement, the patient had left lower abdominal quadriceps pain (left lower quadrant collection). Thus, during the second operation, drainage was performed. It should be mentioned that preoperative antibiotic therapy was included, ciprofloxacin dose was 400 mg intravenous (IV) once, starting within 120 minutes; vancomycin dose was 1000 mg IV once, starting within 60 minutes. Also, postoperative antibiotic therapy **AQ3** were conduct during 5 days, using 1000 mg, meropenem IV, every 8 hours and 500 mg vancomycin IV, every 12 hours. Finally, 30 days after the operation, the patient recovered and was discharged from the hospital in a very good condition.

DISCUSSION

We described a very rare gastrointestinal anthrax in a pregnant woman who was successfully treated, and according to the study of related literature, she was the first pregnant woman affected by gastrointestinal anthrax that survived. We know that anthrax was described in many studies as a zoonotic infection in humans.[1,9] Patients with gastrointestinal disorders usually show several symptoms after eating meat or visceral tissue of livestock, such as sheep or cow.[10] In this study, the examination of the patient's history showed that she had eaten undercooked sheep liver, and her major symptoms were as follows: abdominal pain, cramps, nausea, and hemorrhagic diarrhea.

Because of the defect of the immune system during pregnancy, it is necessary to diagnose anthrax and treat properly.[5] There are only 3 documented studies regarding gastrointestinal anthrax in pregnant women.[5] The first one was described by Marchand's report, who **AQ4**

From the *Department of Health Sciences, Esfarayen Faculty of Medical Sciences, Esfarayen; †Department of Environmental Health Sciences, North Khorasan University of Medical Sciences, Bojnord; and ‡ Department of Basic Sciences, Esfarayen Faculty of Medical Sciences, Esfarayen, Iran.
Correspondence to: Bagher Moradi, PhD, Department of Basic Sciences, Esfarayen faculty of medical sciences, Esfarayen, Iran.
E-mail: moradib901@gmail.com.
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explained a pregnant woman exposed to horse hair with bloated abdomen and abdominal pain. Finally, the patient died without any treatment, and also a neonatal death was reported 4 days after birth.[5] However, in our study, undercooked sheep liver was the source of infection, so the treatment was performed. The second gastrointestinal anthrax report in a pregnant woman was reported by Handjani. Clinical manifestations were as follows: abdominal pain, edema of vulva, shock, hypotension, and ascites. Treatment was begun by penicillin and streptomycin. However, because of edema and ascites in the abdominal tract, surgery was proposed and performed. Unfortunately, unlike the present study, antibiotic therapy and surgery were unsuccessful, and maternal death 8 hours after surgery and fetal death during laparotomy were noted.[5]

The third study, conducted by Sujatha, explained anthrax in a pregnant woman who had eaten undercooked beef and her clinical symptoms, including vomiting, abdominal pain, hemorrhagic diarrhea, and abdominal distension were appeared 4 days later. Treatment was directed by cefotaxime and metronidazole; however, maternal and fetal death occurred.[8] The situation of the third patient was similar to our patient, but unlike the present study, the performed treatment was only antibiotic therapy, which was unsuccessful. After reviewing the documentary reports, we found that there was no study conducted on gastrointestinal anthrax of pregnant woman who was successfully treated. However, in the present study, we reported the first pregnant woman with gastrointestinal anthrax to be successfully treated. Also, the diagnosis was confirmed by microscopic examination of maternal peritoneal fluid or blood specimens and neonatal blood specimens. Because of the importance of paraclinical diagnostic tests in primary diagnosis, it is recommended that these tests should be performed for the patient, and laparotomy can also be considered as an appropriate method for treatment with antibiotic therapy using ciprofloxacin, meropenem, and vancomycin.

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