



# *Salmonella* Group B and Gastroenteritis Linked to Consumption of Raw Vegetables: A Case Report

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Published Online February 27, 2018

Keywords: *Salmonella*, Gastroenteritis, Alborz



## Abstract

We present a case of gastroenteritis caused by *Salmonella* due to the consumption of raw vegetables and water in a farm. A 62-year-old female from north of Iran was travelling to Karaj. In the way to Karaj, the patient consumed raw unwashed vegetables from a farm. After a few hours she complained of gastrointestinal disturbances. She was admitted to the emergency department for evaluation of frequent severe watery diarrhea. Stool culture was performed at admission which was found positive for *Salmonella* group B. This bacterium is sensitive to ceftriaxon, amikacin, co-trimoxazole, nalidoxoc acid, nitrofurantoin, piperacillin and ciprofloxacin. Therefore, treatment was initiated with metronidazole and ciprofloxacin resulting in rapid improvement of the patient's symptoms. The patient was discharged from the hospital after 3 days. She remained well without evidence of recurrence of symptoms during a 2-month follow-up period.

Received November 7, 2017; Revised January 27, 2018; Accepted January 29, 2018

## Background

Diarrhea has a major burden on health care centers all over the world particularly in developing countries.<sup>1</sup> Most dysentery cases are caused by *Shigella*, and *Salmonella*. Actually, *Salmonella* is responsible for a spectrum of diseases in humans with diverse clinical manifestations.<sup>2</sup> Antimicrobial resistance among these kinds of bacteria has been associated with adverse clinical outcomes.<sup>3</sup> The antimicrobial agents used to treat severe infections caused by *Salmonella* spp. include ceftriaxone, ciprofloxacin, and ampicillin.<sup>4,5</sup> We document a case of gastroenteritis caused by *Salmonella* group B due to the consumption of water and unwashed vegetables.

## Case Presentation

A 62-year-old female from north of Iran was travelling to Karaj. In the way to Karaj, the patient consumed water and raw unwashed vegetables from a farm. After a few hours she complained of gastrointestinal disturbances. She was admitted to the emergency department for evaluation of frequent severe watery diarrhea. The medical history revealed hypertension and hyperlipidemia and nervous discomfort due to diarrhea, fever and chills, nausea from the last 3-4 days. She was not under any medication. On clinical examination, her temperature was 38.7°C. Her blood pressure was 100/60 mm Hg and her pulse rate was

102 beats per minute.

Laboratory values revealed: hematocrit 40.8%, hemoglobin 13.1 g/dL, mean corpuscular volume 84.3 fl, mean corpuscular hemoglobin 27 pg, mean corpuscular hemoglobin concentration 32 g/dL, white blood count 8500 m<sup>3</sup> (75% neutrophils, 7% lymphocytes, 17% monocytes), and normal platelets. The erythrocyte sedimentation rate was accelerated and C-reactive protein was elevated. Sodium, potassium, calcium, phosphorus, and lactate dehydrogenase were 130, 3.2, 9.6 mg/dL, 3.5 mg/dL, and 325 U/L, respectively. Other blood chemistry results, including glucose, aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase,  $\alpha$ -glutamyl-transferase, bilirubin, triglycerides, serum amylase, and uric acid were normal. She was treated by fluid, antibiotic and electrolyte therapy.

Stool culture was performed at admission which was found positive for *Salmonella* group B. This bacterium is sensitive to ceftriaxon, amikacin, co-trimoxazole, nalidoxoc acid, nitrofurantoin, piperacillin and ciprofloxacin. Therefore, treatment was initiated with metronidazole and ciprofloxacin resulting in rapid improvement of the patient's symptoms. The patient was discharged. She remained well without evidence of recurrence of symptoms during a 2-month follow-up period.

## Discussion

*Salmonella* infections are an important health problem and represent a very frequent cause of foodborne diseases like gastroenteritis. Although typical gastroenteritis is self-limited, many cases are sufficiently severe to cause hospitalization or even death.<sup>6</sup> The Centers for Disease Control and Prevention (CDC) has previously reported regional differences in the prevalence of various *Salmonella* spp.<sup>7</sup>

In our case, *Salmonella* group B was isolated and identified, although it has been known to cause typical gastroenteritis with diarrhea, vomiting, and fever. Our results are consistent with other reports from Iran.<sup>7</sup> Similarly, in Iran, it has long been known that raw vegetables can be a good source of *Salmonella*.<sup>8</sup> In our laboratory, by setting a disk diffusion method, antimicrobial resistance of this strain was determined and all the antibiotics used for the susceptibility testing showed excellent activity against the target culture. We believe these results must be confirmed by MIC (minimum inhibitory concentration) determination. Multidrug-resistant *Salmonella* spp., defined as resistant to ampicillin, SXT, and chloramphenicol, are common in even developed countries.<sup>9,10</sup>

The cultural diversity in Iran affords ample opportunities to eat raw vegetables which may cause *Salmonella* gastroenteritis. Therefore, all persons should be reminded to thoroughly wash the vegetables and adhere to safe food handling practices.

## Authors' Contributions

EK, AEH and PF found the case and performed the work. MHD designed and wrote the manuscript. The experiments were approved by rest of the authors.

## Ethical Approval

The report of the case was approved by Alborz University Ethics Committee, Karaj (Abzums.Rec.1396,166).

## Conflict of Interest Disclosures

The authors declare that they have no conflict of interests.

## Financial Support

This work did not receive any specific grant from any funding agency.

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