

CASE REPORT

Open Access

Human infections due to *Salmonella* Blockley, a rare serotype in South Africa: a case report

Thandubuhle Gonose^{1,6*}, Anthony M Smith^{1,2}, Karen H Keddy^{1,2}, Arvinda Sooka¹, Victoria Howell³, Charlene Ann Jacobs⁴, Sumayya Haffejee³ and Premi Govender⁵

Abstract

Background: Infections due to nontyphoidal *Salmonella* have increased worldwide over the last couple of decades. *Salmonella enterica* serotype Blockley (*Salmonella* Blockley) infections is associated with chickens and is a rarely isolated serotype in human infections in most countries.

Case presentation: We report a case of human infections due to *Salmonella* Blockley in KwaZulu-Natal, South Africa in 2011. Three African males (aged 4, 14 and 16) presented to a clinic with diarrhoea, stomach cramps and headache. They started experiencing signs of illness a day after they consumed a common meal, consisting of meat, rice and potatoes. Stool specimens from the patients cultured *Salmonella* Blockley. The strains showed an indistinguishable pulsed-field gel electrophoresis pattern.

Conclusion: This is the first recorded case of human infections due to *Salmonella* Blockley in South Africa.

Keywords: Human infections, *Salmonella* Blockley, Rare serotype

Background

Human infections due to *Salmonella* is a public health problem both in developed and in developing countries [1]. Annually, 1.6 million cases of typhoid fever, 1.3 billion cases of gastroenteritis and 3 million deaths due to *Salmonella* are reported worldwide [2]. Infections due to nontyphoidal *Salmonella* have increased worldwide over the last couple of decades and are the cause of acute gastrointestinal illness which is characterised by diarrhoea, stomach cramps and fever [3].

Salmonella enterica serotype Blockley (*Salmonella* Blockley) is a rarely isolated serotype in most countries. However, *Salmonella* Blockley was among the twenty most frequently isolated serotypes in 17 European countries over the period 1998 to 2002 [3]. Single outbreaks of *Salmonella* Blockley have been reported in the United States of America and Greece, while several sporadic cases have been reported in Europe [4,5]. In South

Africa, only nine cases of *Salmonella* Blockley were identified by the Centre for Enteric Diseases (CED) of the National Institute for Communicable Diseases (NICD) over the period 2003 to 2011. We now report a case of human infections caused by *Salmonella* Blockley in KwaZulu-Natal, South Africa.

Case presentation

Three African males from the same family (aged 4, 14 and 16 years) became ill after eating a meal on 23 September 2011. They presented to a clinic with diarrhoea, stomach cramps and headache on 24 September 2011, a day after consuming the meal. The meal consisted of meat, rice and potatoes. The meat was obtained from a cow that died on 22 September 2011; the cow died after it consumed an unspecified plastic material. The cow was subsequently slaughtered and the meat was shared among the villagers for consumption. According to the mother of the three children, the meat was prepared and boiled on the day of slaughter (22 September 2011), but they only warmed it up the following day when the children ate it. No other village members reported any symptoms of illness. On arrival at the clinic, the three patient's temperature was checked and it was normal for the three of them. Stool samples were taken from the

* Correspondence: thandubuhleg@nicd.ac.za

¹Centre for Enteric Diseases (CED), National Institute for Communicable Diseases (NICD) of the National Health Laboratory Service (NHLS), Johannesburg, South Africa

⁶Centre for Enteric Diseases, National Institute for Communicable Diseases, Private Bag X4, 2131 Gauteng, Sandringham, South Africa
Full list of author information is available at the end of the article

three patients and sent for laboratory for analysis. The patients were sent home with medication.

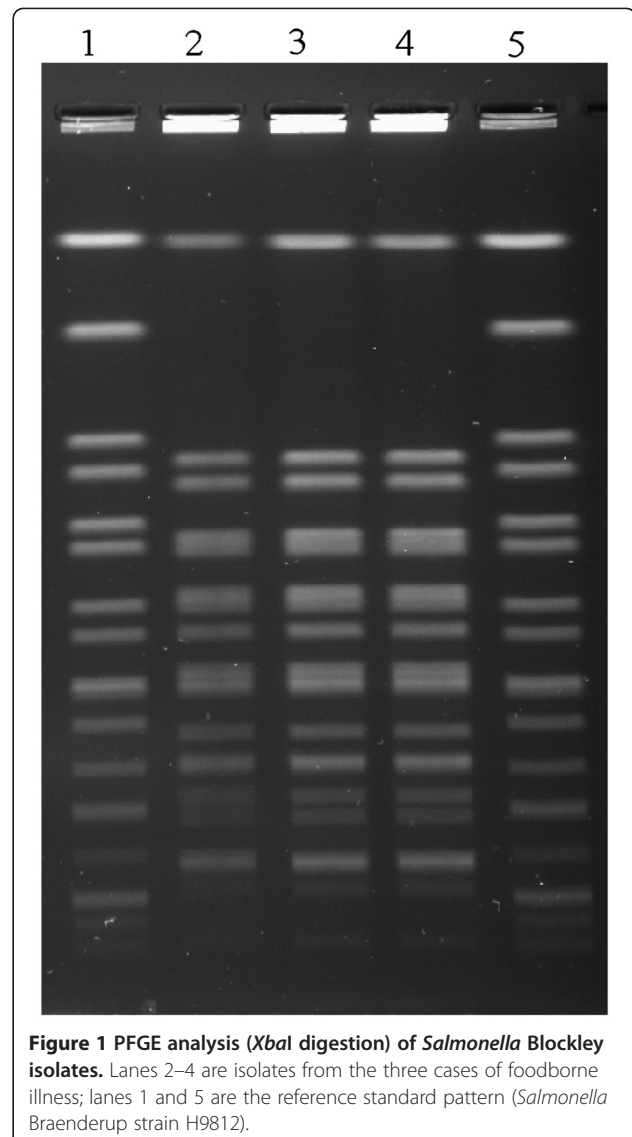
Identification of the isolates was done using VITEK-2 Compact (bioMérieux, Inc Durham NC, United States of America) and confirmed by serotyping using specific antisera (Mast Assure, Mast Group Ltd., Merseyside, United Kingdom), according to the Kauffman-White scheme. Antimicrobial susceptibility to ampicillin, augmentin, trimethoprim, sulphamethoxazole, chloramphenicol, nalixidic acid, ciprofloxacin, kanamycin, streptomycin, ceftriaxone, cefepime, imipenim and tetracycline was determined by Etest (bioMérieux, Marcy-l'Etoile, France). The genetic relatedness of the isolates was determined using pulsed-field gel electrophoresis (PFGE) analysis of *Xba*I-digested genomic DNA on a CHEF-DR III electrophoresis system (Bio-Rad Laboratories, Hercules, USA), using PulseNet protocol [6]. The patterns were analysed using BioNumeric (version 6.01) software (Applied Maths, Sint-Martens-Latem, Belgium).

Laboratory examination isolated *Salmonella* Blockley from the three stool samples. All the isolates were susceptible to ampicillin, chloramphenicol, streptomycin, sulphamethoxazole, trimethoprim, nalixidic acid; and all were resistant to tetracycline. PFGE restriction fragment patterns were identical for all three isolates (Figure 1). The identity in antibiotic susceptibility and PFGE patterns among the three *Salmonella* Blockley strains indicated that the source of infection was common. Unfortunately there were no food samples taken for analysis, therefore the source of infection remains unknown. Although chickens are the major source of *Salmonella* Blockley, previous studies have indicated that this serotype can be obtained from different sources such as eggs, smoked eel and vegetables [4,5]. Moreover, other factors such as food storage, unhygienic behavior of food handlers, poor food preparation and poor food serving can increase the risk of cross contaminations [4,5].

There are few reported cases of infections due to *Salmonella* Blockley. According to a PubMed literature search, the first reported cases date back to 1966 [5]. In 1989, the first isolation of *Salmonella* Blockley in Thailand from animal feed and chicken feathers was reported [7]. Recently, *Salmonella* Blockley isolation has been noted in other countries such as Europe and United States of America. However, it remains a rarely isolated serotype in human infections in South Africa and in most countries. Despite its low frequency of isolation, *Salmonella* Blockley has shown high rates of multidrug resistance among *Salmonella* isolates in Greece [8].

Conclusions

To the best of our knowledge, this is the first documented case of human infections due to *Salmonella* Blockley



in South Africa. Just like any other reported case of human infection due to *Salmonella* species, we emphasize that more awareness on hygiene, sanitation and proper preparation of food should be increased. Fortunately, the disease in this particular case was mild with no mortality occurring. Given the emergence of *Salmonella* Blockley in most countries, reported cases can be very useful in identifying the similarities between strains from different countries.

Consent

Written informed consent was obtained from the patient's parent/ legal guardian for publication of this Case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

Abbreviations

DNA: Deoxyribonucleic acid; CHEF: Contour-clamped homogeneous electric fields; PFGE: Pulse-field gel electrophoresis.

Competing interests

The authors declare that they have no competing interest.

Authors' contributions

TG, VH, SH carried out laboratory test for the identification of isolates. CAJ, PG participated in obtaining the information from family regarding food they ate and communicated it to laboratories. TG, AMS, KHK, AS participated in drafting the manuscript. All authors read and approved the final manuscript.

Authors' information

AMS – BSc (honours), PhD Microbiology; senior medical scientist at CED.
TG – BSc (honours) Microbiology; Intern medical scientist at CED.

Acknowledgements

We thank investigators which were involved in this study; affiliated with the following institutions: KwaZulu-Natal Department of Health; Division of Surveillance, Outbreak Response and Travel Health, NICD. We thank staff from various microbiology laboratories for submitting isolates to the CED.

Author details

¹Centre for Enteric Diseases (CED), National Institute for Communicable Diseases (NICD) of the National Health Laboratory Service (NHLS), Johannesburg, South Africa. ²Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa. ³Department of Microbiology, Greys Pathology Laboratory, NHLS, Pietermaritzburg, South Africa. ⁴Division of Surveillance, Outbreak Response and Travel Health, NICD, NHLS, Johannesburg, South Africa. ⁵KwaZulu Natal Department of Health, Pietermaritzburg, South Africa. ⁶Centre for Enteric Diseases, National Institute for Communicable Diseases, Private Bag X4, 2131 Gauteng, Sandringham, South Africa.

Received: 21 May 2012 Accepted: 21 September 2012

Published: 10 October 2012

References

1. Niehaus JA, Apalata T, Coovadia MY, Smith MA, Moodley P: **An outbreak of foodborne Salmonellosis in rural Kwazulu-Natal South Africa.** *Foodborne pathogens diseases* 2011, **8**:693–697.
2. Pui CF, Wong WC, Chai LC, Tunung R, Jeyaletchumi P, Noor Hidayah MS, *et al*: **Salmonella: A foodborne pathogen.** *Int Food Research J* 2011, **18**:465–473.
3. Kåre M, Olsen JE, Wegener HC: **Salmonella infections.** In *Foodborne infections*. Third edition. Edited by Riemann HP, Cliver DO. California, USA: Elsevier Academic Press Publishers; 2006:57–115.
4. Fell G, Hamouda O, Lindner R, Rehmet S, Liesegang A, Prager R, *et al*: **An outbreak of Salmonella blockley infections following smoked eel consumption in Germany.** *Epidemiol Infect* 2000, **125**:9–12.
5. Morse LJ, Rubenstein AD: **A food-borne institutional outbreak of enteritis due to Salmonella blockley.** *J Am Med Assoc* 1967, **202**:939–940.
6. Ribot EM, Fair MA, Gautom R, Cameron DN, Hunter SB, Swaminathan B, *et al*: **Standardisation of pulse-field gel electrophoresis protocols for subtyping of Escherichia coli O157:H7, Salmonella, Shigella for PulseNet.** *Foodborne Pathog Dis* 2006, **3**:59–67.
7. Bangtrakulnonth A, Suthienkul O, Kitjakara A, Pornrungwong S, Siripanichgon K: **First isolation of Salmonella Blockley in Thailand.** *Southeast Asian J Trop Med Public Health* 1994, **25**:668–692.
8. Tassios PT, Chadjichristodoulou C, Lambiri M, Kansouzidou-Kanakoudi A, Sarandopoulou Z, Kourea-Kremastinou J, *et al*: **Molecular typing of multidrug-resistant Salmonella Blockley outbreak isolates from Greece.** *Emerg Infect Dis* 2000, **6**:60–64.

doi:10.1186/1756-0500-5-562

Cite this article as: Gonose *et al*: Human infections due to *Salmonella* Blockley, a rare serotype in South Africa: a case report. *BMC Research Notes* 2012 **5**:592.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

