



# Shigellosis in a Newborn---An Uncommon Case

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**Abstract:** A new born baby was admitted to the Glocal hospital, Krishnanagore, and presented with loose stools mixed with blood and mucous and abdominal distension for last five days. The baby was crying all through the day; presumably, he had severe tenesmus (a feeling of incomplete sense of defecation with rectal pain). He was diagnosed, clinically, to be suffering from shigellosis, which was confirmed by isolation of *Shigella* spp; by stool culture. The baby recovered with antibiotic treatment. It is an uncommon case of shigellosis in new born babies. Hand washing practices are recommended to prevent transmission of shigellosis and other diseases as well. Shigellae vaccines are attractive disease prevention strategy. Shigellosis caused by *S. flexneri* type 2 and *S. dysenteriae* type 1 are the two most common and important serotype candidates against which vaccine development are currently being directed.

**Keywords:** Shigellosis, Antimicrobial Resistance, Gut Involvement, Culture, New Born

## 1. Introduction

Shigellosis is a serious public health problem in the under developed countries. Shigellosis is characterized by fever with chills, frequent loose stools mixed with blood and mucous, abdominal cramps and tenesmus (a sense of incomplete defecation with rectal pain) [1-3]. Shigellosis is caused by *Shigella* spp. There are four serotypes of *shigellae* -*S. sonnei*, *S. boydii*, *S. flexneri* and *S. dysenteriae*. Each consists of a number of subtypes. *S. sonnei* and *S. boydii* cause mild dysentery which is usually self-limiting and mostly seen in developed countries [4-5]. *S. dysenteriae* type 1 is a multi-drug resistant strain and notorious for causing severe epidemic dysentery and even pandemics (epidemic worldwide) [6-9].

*S. dysenteriae* type 1 [10-21]. Shigellosis is known to be associated with many complications, e.g. febrile convulsions, arthralgia, arthritis, leukemoid reaction (WBC count > 50,000/cmm<sup>3</sup>), colitis, rectal prolapse, toxic mega colon, pneumonitis, skin rashes and occasionally Hemolytic Uremic Syndrome (HUS). HUS is characterized by a triad of hemolytic anaemia, thrombocytopenia and renal failure. Renal failure may be fatal.

The disease occurs in situations like poor sanitation, poverty

and in refugee camps. It can occur as sporadic cases and in endemic and epidemic forms. It is well known to cause severe epidemics worldwide (pandemic). Often, it is confused with amoebic dysentery. Actually, an epidemic of dysentery which started in Guatemala was initially thought to be an amoebic dysentery epidemic in Latin America. As major epidemics are usually caused by *S. dysenteriae* type 1, this is often multi-drug resistant and poses a tremendous therapeutic challenge to the treating clinicians. A large number of complications were reported in association the epidemic shigellosis in Andaman & Nicobar Islands than during the same epidemic in Kolkata. *S. dysenteriae* type 1 related cases were earlier reported from Bangladesh and other places. The complications often kill the patient rather than the disease. The disease usually affects children as well as adults, spares generally the newborns since they are unlikely to come into contact with apparent cases or those who are excreting the bacteria. In this communication, we report an unusual and rare case of shigellosis affecting a new born baby.

## 2. Material and Methods

The baby admitted to the department of pediatrics, Glocal

hospital, Krishnanagore, is the subject of this report. Routine stool examination and culture were performed using standard procedure. Antimicrobial susceptibility pattern was determined by Kirby-bauer disc diffusion technique. The stool frequency was monitored to see the progress of treatment.

### 3. Results

A new born baby was admitted to the Glocal hospital with loose stools, mucous and abdominal distension for five days. Initially, the stools were watery but afterwards the stools became bloody. Besides, she had mild fever and was crying excessively, presumably from pain due to tenesmus.

Routine stool examination showed that there were plenty of pus cells on microscopic examination and culture revealed a pure growth of *Shigella* spp. The antimicrobial susceptibility pattern demonstrated resistance to commonly used antibiotics e.g.; ampicillin, co-trimoxazole, tetracycline, chloramphenicol and streptomycin; however, the strain was sensitive to Piperacillin+ Tazobactam and the baby was treated with the drug. Along with antibiotic treatment, the baby also received oral rehydration salt solution (ORS) recommended by World Health Organization. There were no complications and the baby recovered in a few days. Because of the rapid development of drug resistance in *Shigella*, it is essential to know the drug resistance pattern of isolates circulating in the area.

### 4. Discussion

Shigellosis is essentially a disease of poverty, poor sanitation, hygiene and overcrowding. Clinically, the disease (Shigellosis) can manifest from mild diarrhea to severe life-threatening dysentery (frequent passage of loose stools mixed with blood, mucous and tenesmus). *Shigella* strains are often multi-drug-resistant, particularly *Shigella dysenteriae* type 1. Multi-drug resistant strains may cause epidemics and even pandemics. Treatment of dehydration, if present, should be corrected by giving oral rehydration salt solution (ORS) along with suitable antibiotic to which strains are sensitive. Upon recovery, nutrition should be given top priority.

In 1961, a pandemic started in Guatemala and spread widely. Initially, it was thought to be caused by *Entamoeba histolytica*. Subsequently, it proved to be due to multiply drug-resistant *S. dysenteriae* type 1. An epidemic of multi-drug resistant *S. dysenteriae* type 1 also swept through Calcutta (now known as Kolkata) and neighboring states in 1984. The circulating strains were resistant to ampicillin, tetracycline, co-trimoxazole and chloramphenicol; however, the strains were sensitive to Nalidixic acid. This drug saved many lives. Subsequently, fluoroquinolones became available; it was found that these generations of drugs were highly effective in the treatment of this multi-drug resistant *S. dysenteriae* type 1. A single-dose treatment of ciprofloxacin was tried and was found effective except for *S. dysenteriae* type 1. Amoxicillin is ineffective for treating shigellosis

cases. The epidemic spread to Andaman & Nicobar Islands causing a serious public health problem. Shigellosis associated complications were seen more in Andaman & Nicobar Islands than in the mainland. *Shigellae* produce a toxin known as "shiga toxin". In the pathogenesis of shigellosis, there are two phases of action; it is biphasic. The first phase consists of liberation of an enterotoxin in the small intestine, which produces watery stools and in the second phase, when it colonizes in the large intestine, it produces bloody diarrhea (dysentery). Hemolytic Uremic syndrome (HUS), a triad of hemolytic anaemia, thrombocytopenia and renal failure, is one of the many complications of shigellosis which may be fatal.

Hand washing practices are recommended to person to person transmission prevent shigellosis and other diseases as well. *Shigellae* are attractive disease prevention strategy. Shigellosis caused by *S. flexneri* type 2 and *S. dysenteriae* type 1 are the two most common and important serotypes candidates against which vaccine development are currently being directed [22-23].

### 5. Conclusion

Shigellosis is an important cause of morbidity and mortality in many developing countries. The *Shigellae* are prevalent in areas where sanitation is poor, safe water is not available and hygiene is bad. Shigellosis usually affects young children and adults. Here we report a case of shigellosis in a Newborn. This is rare and less than 20 cases have been reported worldwide. Any neonate passing stool with blood and mucous should be treated keeping in mind shigellosis and culture of the stool is essential.

### References

- [1] S. K. Bhattacharya, D. Sur, "Shigellosis". International Encyclopedia of Public Health, Second Edition, vol. 2, pp. 499-501, 2017.
- [2] S. K. Bhattacharya, D. Sur, D. Mahalanabis, Public health significance of shigellosis. Indian Pediatr, vol. 49, pp. 269-70, 2012.
- [3] S. K. Bhattacharya, D. Sur, Shigellosis. Expert Opin Pharmacotherapy, vol. 4 (8): pp. 1315-1320, 2003.
- [4] S. Dutta S, K. Rajendran, S. Roy, A. Chatterjee, P. Dutta, G. B. Nair, "Shifting serotypes, plasmid profile analysis and antimicrobial resistance pattern of shigellae strains isolated from Kolkata, India during 1995-2000". Epidemiol Infect, vol. 129 (2), pp. 235-237, 2012.
- [5] R. Ranjbar, M. Bolandian, P. Behzadi, "Virulotyping of *Shigella* spp. isolated from pediatric patients in Tehran, Iran", Acta Microbiol Immunol Hung, vol. 64 (1), pp. 71-80, 2017.
- [6] G. P. Pazhani, B. Sarkar, T. Ramamurthy, S. K. Bhattacharya, Y. Takeda, S. K. Niyogi, "Clonal multidrug-resistant *Shigella dysenteriae* type 1 strains associated with epidemic and sporadic dysenteries in eastern India". Antimicrob Agents Chemotherapy, vol. 48 (2), pp. 681-684, 2004.

- [7] G. P. Pazhani, T. Ramamurthy, U. Mitra, S. K. Bhattacharya, S. K. Niyogi, G. P. Pazhani, "Species diversity and antimicrobial resistance of *Shigella* spp. isolated between 2001 and 2004 from hospitalized children with diarrhoea in Kolkata (Calcutta), India". *Epidemiol Infect*, vol. 133 (6), pp. 1089-1095, 2005.
- [8] S. K. Niyogi, K. Sarkar, P. Lalmalsawma, N. Pallai, S. K. Bhattacharya, "An outbreak of bacillary dysentery caused by quinolone-resistant *Shigella dysenteriae* type 1 in a northeastern state of India", *J Health Popul Nutr*, vol. 22 (1), pp. 97, 2004.
- [9] G. P. Pazhani, Sarkar, T. Ramamurthy, S. K. Bhattacharya, Y. Takeda, S. K. Niyogi, "Clonal multidrug-resistant *Shigella dysenteriae* type 1 strains associated with epidemic and sporadic dysenteries in eastern India". *Antimicrob Agents Chemother*, vol. 48 (2), pp. 681-668, 2004.
- [10] S. K. Niyogi, S. Sarkar, P. Lalmalsawma, N. Pallai, S. K. Bhattacharya, "An outbreak of bacillary dysentery caused by quinolone-resistant *Shigella dysenteriae* type 1 in a northeastern state of India". *J Health Popul Nutr*, vol. 22 (1), pp. 97, 2004.
- [11] S. Dutta, S. Dutta, P. Dutta, S. Matsushita, S. K. Bhattacharya, S. Yoshida. "*Shigella dysenteriae* serotype 1, Kolkata, India". *Emerg Infect Dis*, Vol.9 (11), pp. 1471-1474, 2003.
- [12] S. Dutta, A. Ghosh, K. Ghosh, D. Dutta, S. K. Bhattacharya, G. B. Nair, Yoshida S, "Newly emerged multiple-antibiotic-resistant *Shigella dysenteriae* type 1 strains in and around Kolkata, India, are Clonal". *J Clin Microbiol*, vol. 41 (12): 5833-5834, 2003.
- [13] S. K. Bhattacharya, K. Sarkar, G. Balakrish Nair, A. S. Faruque, D. A. Sack. "Multidrug-resistant *Shigella dysenteriae* type 1 in south Asia", *Lancet Infect Dis*, vol.3 (12), 755, 2003.
- [14] D. Sur, S. K. Niyogi, D. Sur, K. K. Datta, Y. Takeda, G. B. Nair, S. K. Bhattacharya, "Multidrug-resistant *Shigella dysenteriae* type 1: forerunners of a new epidemic strain in eastern India?". *Emerg Infect Dis*, vol. 9 (3): 404-405, 2003.
- [15] S. Dutta, S. Dutta S, P. Dutta, S. Matsushita, S. K. Bhattacharya, S. Yoshida, "*Shigella dysenteriae* serotype 1, Kolkata, India". *Emerg Infect Dis*, Vol. 19, pp. 1471, 2003.
- [16] G. P. Pazhani, B. Sarkar, T. Ramamurthy, S. K. Bhattacharya, Y. Takeda, S. K. Niyogi. "Clonal multidrug-resistant *Shigella dysenteriae* type 1 strains associated with epidemic and sporadic dysenteries in eastern India". *Antimicrob Agents Chemother*, vol. 48 (2), pp. 681-684, 2004.
- [17] S. Dutta, P. Dutta, S. Matsushita, S. K. Bhattacharya, S. Yoshida, "Newly emerged multiple-antibiotic-resistant *Shigella dysenteriae* type 1 strains in and around Kolkata, India, are clonal", *Emerg Infect Dis*, vol. 9 (11): pp. 1471-1474, 2003.
- [18] S. Dutta, A. Ghosh, K. Ghosh, D. Dutta, S. K. Bhattacharya, G. B. Nair, "*Shigella dysenteriae* serotype 1, Kolkata, India". *J Clin Microbiol*, vol. 41 (12), pp. 5833-5834, 2003.
- [19] S. K. Niyogi, K. Sarkar, P. Lalmalsawma, N. Pallai, S. K. Bhattacharya, "An outbreak of bacillary dysentery caused by quinolone-resistant *Shigella dysenteriae* type 1 in a northeastern state of India". *J Health Popul Nutr*, vol. 22 (1), 97, 2004.
- [20] S. Dutta, A. Ghosh, K. Ghosh, D. Dutta, S. K. Bhattacharya, G. B. Nair, S. "Newly emerged multiple antibiotic resistant *Shigella dysenteriae* type 1 strains in and around Kolkata, India, are clonal". *J Clin Microbiol*, vol. 41 (12), 5833-5834, 2003.
- [21] C P, P. Desai, R. K C, "Molecular Evaluation of High Fluoroquinolones Resistant Genes in Endemic Cases of Shigellosis, Northeast Part of Karnataka, India". *Ann Glob Health*, Vol. 82 (5), 832-839, 2016.
- [22] M. K. Chakrabarti, J. Bhattacharya, M. K. Bhattacharya, G. B. Nair, S. Bhattacharya, K. Mahalanabis D, "Killed oral *Shigella* vaccine made from *Shigella flexneri* 2a protects against challenge in the rabbit model of shigellosis". *Acta Paediatr*, vol. 88 (2), pp.161-165, 1999.
- [23] H. Shen, J. Chen, Y. Xu, Z. Lai, J. Zhang, H. Yang H, "An outbreak of shigellosis in a Children Welfare Institute caused by a multiple-antibiotic-resistant strain of *Shigella flexneri* 2a". *J Infect Public Health*, vol. 17, pp. 1876-0341, 2017.