



# Is Sinus Bradycardia a Side Effect of Clindamycin in Treatment of Septic Abortion? A Case Report

Sedigheh Ghasemian Dizajmehr<sup>1,\*</sup>, Farzaneh Rashidi Fakari<sup>2</sup>, Samira Jahangard<sup>3</sup>, Elham Rajabi<sup>3</sup> and Mohsen Ghasemian<sup>4</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran

<sup>2</sup>Student Research Committee, Department of Midwifery and Reproductive Health, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>3</sup>School of Medicine, Urmia University of Medical Sciences, Urmia, Iran

<sup>4</sup>Department of Cardiovascular, School of Medicine, Ardabil University of Medical Sciences, Ardabil, Iran

\*Corresponding author: Department of Obstetrics and Gynecology, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran. Tel: +98-9144712901, Fax: +98-4431977149, Email: dr.ghasemian@yahoo.com

Received 2018 March 22; Revised 2018 August 08; Accepted 2018 September 03.

## Abstract

**Introduction:** Clindamycin is the preferred antimicrobial agent in the treatment of septic abortions. However, the administration of this medication may be associated with side effects. We describe the uncommon case of a patient who developed chest pain and sinus bradycardia following the administration of clindamycin.

**Case Presentation:** A 19-year-old primigravid woman presented herself to Shahid Motaharri Hospital (Urmia, Iran) with high grade fever and severe pain in the hypogastrum. A physical examination established pyrexia, tachycardia. Vaginal examination revealed active bleeding accompanied by foul-smelling vaginal discharge. Ultrasonography revealed the presence of retained products of conception. Our main diagnosis was septic abortion. The patient was treated by volume replacement and administering intravenous clindamycin and gentamicin. Following the intravenous infusion of clindamycin, an episode of chest pain and bradycardia occurred.

**Conclusions:** Based on the clinical course of the current case, we conclude that the episode of bradycardia was induced by clindamycin administration. Therefore we advise physicians to exercise caution when administering clindamycin due to its possible potential to induce bradycardia.

**Keywords:** Bradycardia, Clindamycin, Abortion, Septic

## 1. Introduction

Clindamycin, 7(s)-chlor-7-deoxy lincomycin, is a semisynthetic, lincosamide antibiotic. Clindamycin has proven to be efficient against Gram-negative, -positive and anaerobic bacteria, rendering it a dependable medication in the treatment of streptococcal and staphylococcal infections (1-4).

Its antibacterial activity is mediated by attachment to the 50S rRNA of bacterial ribosomes, thus inhibiting the synthesis of proteins and disrupting the proper construction of the cellular wall (5). This disruption results in a reduced adherence to the host cell surface, enhancing the intracellular killing of some strains of gram positive and negative organisms as well as anaerobic bacteria, such as *B. fragilis* (6).

Clindamycin is the preferred antimicrobial agent in the treatment of the infectious diseases of the female

genital tract, cases of pelvic inflammatory disease, post-cesarean section endometritis, post-hysterectomy vaginal cuff infections and septic abortions (7, 8).

A number of side effects have been reported following the administration of clindamycin. These include: maculopapular rash, nausea, diarrhea, vomiting, flatulence, esophagitis, erythema multiforme, metallic taste, anorexia, fever and also hematopoietic and, although occurring rarely, cardiopulmonary effects (9). We describe the case of a patient who developed chest pain and sinus bradycardia following the administration of clindamycin.

## 2. Case Presentation

A 19-year-old primigravid woman presented herself at Shahid Motaharri Hospital (Urmia, Iran) with a complaint of high grade fever and severe pain in the hypogastrum. The pain was associated with nausea and vomiting since

the morning of the same day. She exhibited orientation regarding time, place and person. She was gravida 1, para 0, and with a gestational age of 8 weeks.

She had a thin physique and her features were pale. The physical examination revealed a pyrexia of 39°C (axillary), a feeble pulse, tachycardia (PR: 120) and a blood pressure of 90/60 mmHg (obtained from the right hand in a supine position). Bimanual abdominal examination revealed an enlarged uterus with an estimated age of 8 - 10 weeks. The abdomen was tender to the physician's touch. Vaginal examination revealed active bleeding, dilation of the external cervical os equivalent to one finger and putrid smelling vaginal discharge. Her menstrual cycle had resumed following a delay of 8 weeks.

Laboratory investigations reported a positive HCG level for pregnancy, a hemoglobin value of 9 gm/dL, White blood cell count of 30000/mm<sup>3</sup> with 99% neutrophils, platelet count of 150000 and 3+ qualitative C-reactive protein. All electrolytes were reported to be in their respective range of normal values. Ultrasonography revealed the presence of retained products of conception. Based on the presented evidence, septic abortion was decided as the primary diagnosis.

Treatment was initiated with the administration of intravenous clindamycin (900 mg TID) and gentamicin (80 mg TID). Two liters of lactated Ringer's was used as volume replacement. Despite the administration of 6 liters of normal saline blood pressure levels exceeding 80/60 mmHg could not be achieved. Evacuation of the retained products of conception was performed via suction. During the operation two units of blood were transfused (due to an atonic uterus and excessive vaginal bleeding). Oxytocin drop was administered drop (30 units in one liter Ringer's lactate). The patient was taken to the intensive care unit and concurrent resuscitation and investigation was done. The following morning, the patient exhibited bradycardia (PR: 40) and complained of pain in the left side of her chest. Her blood pressure was 100/70 and respiratory rate: 18/min. An ECG was obtained, which represented a sinus bradycardia. Troponin I and creatine kinase-MB values were analyzed and determined to pertain to values within the normal range. Echocardiography revealed an ejection fraction of 50% and the presence of mild mitral regurgitation.

Due to a pulse rate of 50 bpm, an intravenous administration of 4 mg of atropine was performed. The patient remained febrile (T: 37.9°C axillary) despite 48h of antibiotic therapy. Therefore the medications were switched to intravenous administrations of meropenem (1 gr TID) vancomycin (1 gr BID) and metronidazole (500 mg TID). No further modifications were made to daily treatment regimen. The following afternoon, the pulse rate was 65 and normal blood pressure was obtained.

### 3. Discussion

Fortunately, despite the widespread use of clindamycin in the treatment of the infections of the female genital tract, there have been minor reports on the topic of the side effects caused by its administration. Sinus bradycardia is amongst the less commonly reported adverse effects of clindamycin.

The administration of clindamycin is indicated in patients suffering from serious infections arising from anaerobic bacteria, due to its excellent coverage against gram negative and positive organisms, cocci, anaerobic bacteria such as *Chlamydia trachomatis* (10). Zambrano reported the successful use of clindamycin in septic abortion, alone or alongside aminoglycosides (8). Wegner and et al. reported that in healthy subjects, the half-life of clindamycin is 2 hours and 38 minutes (11). Common adverse effects of clindamycin use include gastrointestinal unease, vomiting, nausea, diarrhea, hepatotoxicity, maculopapular rash, anorexia, flatulence, drug fever and Stevens-Johnson syndrome (12, 13). Less common adverse effects include elevated liver transaminase levels, jaundice, monoarthritis, neutropenia, leukopenia, agranulocytosis, hematopoietic, cardiopulmonary arrest and hypotension (9, 14).

Lee et al., have reported that gentamicin and clindamycin stimulate rocuronium-induced neuromuscular blockade. In addition, it was found that these drugs pertain synergistic features when administered concomitantly (7). Fiekers et al. reported that clindamycin affects neural pre and post junctional sites (15). Clindamycin stimulates muscle relaxation and enhances the action of activating neuromuscular agents. Different explanations for clindamycin-induced neuromuscular mechanisms have been proposed (7, 16).

Therefore, the bradycardia was more likely to be related to the administration of clindamycin and professionals should be fully aware of the mechanisms of action and side effects of the antibiotics which they choose to administer. It is suggested that clinical trials be conducted on the side effects of clindamycin.

#### 3.1. Conclusions

We conclude that bradycardia was a result of clindamycin administration and physicians should be aware that this medication may have the potential to induce severe bradycardia and be prepared in case such an adverse effect presents itself.

#### Acknowledgments

The authors thank all the staff members of obstetrics and gynecology department of Motahhari Hospital, Urmia, for their help and suggestions.

## Footnotes

**Conflict of Interests:** It is not declared by the authors.

**Funding/Support:** There is no funding/support for this study.

**Patient Consent:** Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

## References

- Smieja M. Current indications for the use of clindamycin: A critical review. *Can J Infect Dis*. 1998;**9**(1):22–8. doi: [10.1155/1998/538090](https://doi.org/10.1155/1998/538090). [PubMed: [22346533](https://pubmed.ncbi.nlm.nih.gov/22346533/)]. [PubMed Central: [PMC3250868](https://pubmed.ncbi.nlm.nih.gov/PMC3250868/)].
- Chiou CS, Lin SM, Lin SP, Chang WG, Chan KH, Ting CK. Clindamycin-induced anaphylactic shock during general anesthesia. *J Chin Med Assoc*. 2006;**69**(11):549–51. doi: [10.1016/S1726-4901\(09\)70327-2](https://doi.org/10.1016/S1726-4901(09)70327-2). [PubMed: [17116619](https://pubmed.ncbi.nlm.nih.gov/17116619/)].
- Veringa EM, Lambe DW Jr, Ferguson DA Jr, Verhoef J. Enhancement of opsonophagocytosis of *Bacteroides* spp. by clindamycin in subinhibitory concentrations. *J Antimicrob Chemother*. 1989;**23**(4):577–87. doi: [10.1093/jac/23.4.577](https://doi.org/10.1093/jac/23.4.577). [PubMed: [2745261](https://pubmed.ncbi.nlm.nih.gov/2745261/)].
- Veringa EM, Verhoef J. Influence of subinhibitory concentrations of clindamycin on opsonophagocytosis of *Staphylococcus aureus*, a protein-A-dependent process. *Antimicrob Agents Chemother*. 1986;**30**(5):796–7. doi: [10.1128/aac.30.5.796](https://doi.org/10.1128/aac.30.5.796). [PubMed: [3800357](https://pubmed.ncbi.nlm.nih.gov/3800357/)]. [PubMed Central: [PMC176538](https://pubmed.ncbi.nlm.nih.gov/PMC176538/)].
- Ahdal OA, Bevan DR. Clindamycin-induced neuromuscular blockade. *Surv Anesthesiol*. 1996;**40**(4):236. doi: [10.1097/00132586-199608000-00039](https://doi.org/10.1097/00132586-199608000-00039).
- Nastro LJ, Finegold SM. Bactericidal activity of five antimicrobial agents against *Bacteroides fragilis*. *J Infect Dis*. 1972;**126**(1):104–7. doi: [10.1093/infdis/126.1.104](https://doi.org/10.1093/infdis/126.1.104). [PubMed: [5038022](https://pubmed.ncbi.nlm.nih.gov/5038022/)].
- Lee JH, Lee SI, Chung CJ, Lee JH, Lee SC, Choi SR, et al. The synergistic effect of gentamicin and clindamycin on rocuronium-induced neuromuscular blockade. *Korean J Anesthesiol*. 2013;**64**(2):143–51. doi: [10.4097/kjae.2013.64.2.143](https://doi.org/10.4097/kjae.2013.64.2.143). [PubMed: [23459675](https://pubmed.ncbi.nlm.nih.gov/23459675/)]. [PubMed Central: [PMC3581784](https://pubmed.ncbi.nlm.nih.gov/PMC3581784/)].
- Zambrano D. Clindamycin in the treatment of obstetric and gynecologic infections: A review. *Clin Ther*. 1991;**13**(1):58–80. [PubMed: [2029726](https://pubmed.ncbi.nlm.nih.gov/2029726/)].
- Alikhani A, Salehifar E. An unreported clindamycin adverse reaction: Wrist monoarthritis. *Iran J Pharm Res*. 2012;**11**(3):959–62. [PubMed: [24250524](https://pubmed.ncbi.nlm.nih.gov/24250524/)]. [PubMed Central: [PMC3813142](https://pubmed.ncbi.nlm.nih.gov/PMC3813142/)].
- Galask RP, Larsen B. *Infectious diseases in the female patient*. Springer Science & Business Media; 2012.
- Wagner JG, Novak E, Patel NC, Chidester CG, Lummis WL. Absorption, excretion and half-life of clindamycin in normal adult males. *Am J Med Sci*. 1968;**256**(1):25–37. doi: [10.1097/00000441-196807000-00004](https://doi.org/10.1097/00000441-196807000-00004). [PubMed: [5664330](https://pubmed.ncbi.nlm.nih.gov/5664330/)].
- Sivapalasingam S, Steigbigel NH. *Macrolides, clindamycin, and ketolides*. Mandell, Douglas, and Bennett's principles and practice of infectious diseases. 8th ed. Elsevier; 2015. p. 358–76.
- Abishenganaden JA, Aitken ML, Arnold JM. *Melmon and Morrell's clinical pharmacology*. McGraw-Hill, USA; 2000.
- Meadowcroft AM, Diaz PR, Latham GS. Clostridium difficile toxin-induced colitis after use of clindamycin phosphate vaginal cream. *Ann Pharmacother*. 1998;**32**(3):309–11. doi: [10.1345/aph.17251](https://doi.org/10.1345/aph.17251). [PubMed: [9533061](https://pubmed.ncbi.nlm.nih.gov/9533061/)].
- Fiekers JF, Henderson F, Marshall IG, Parsons RL. Comparative effects of clindamycin and lincomycin on end-plate currents and quantal content at the neuromuscular junction. *J Pharmacol Exp Ther*. 1983;**227**(2):308–15. [PubMed: [6313896](https://pubmed.ncbi.nlm.nih.gov/6313896/)].
- Rubbo JT, Gergis SD, Sokoll MD. Comparative neuromuscular effects of lincomycin and clindamycin. *Anesth Analg*. 1977;**56**(3):329–32. doi: [10.1213/00000539-197705000-00001](https://doi.org/10.1213/00000539-197705000-00001). [PubMed: [194504](https://pubmed.ncbi.nlm.nih.gov/194504/)].