



## Ciprofloxacin in Neonatology

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### Abstract

**Introduction:** Ciprofloxacin has often been used in off-label pediatrics. In neonatology, its use, although rare, is authorized in the event of a life-threatening infection.

**Material and Methods:** We conducted a retrospective study over a period from January 2017 to September 2019. Ciprofloxacin was prescribed in 13 newborns. The interest of our study is to report the experience of the neonatal intensive care unit at the Mohammed VI hospital center in Marrakech with regard to the use of quinolones and to compare these benefits/risks.

**Results:** The most common reason for admission was neonatal seizures in 30.8%, followed by neonatal respiratory distress in 23.1%. Among the indications: Nosocomial infection in 53.8% with isolation of 3 cases of *Klebsiella pneumoniae*, 2 cases of *Enterobacter cloacae*, one case of *Klebsiella pneumoniae* associated with *Enterobacter cloacae* and one case of *Acinetobacter baumannii*; followed by ventriculitis in 23.1%. No immediate side effects have been identified. At the end of the treatment, 9 newborns were cured against 4 deceased cases.

**Conclusion:** Ciprofloxacin can be a good therapeutic choice in case of lethal infection. Their side effects are rare.

**Keywords:** Newborn; Ciprofloxacin; Multidrug-resistance seeds

### Introduction

The use of quinolone in children is very limited, even more absolutely contraindicated because of the side effects to which they expose this age group to develop arthropathy. However, they are used in special circumstances as the ultimate rescue treatment, when no other alternative is available. We emphasize the contribution of quinolone in situations of extreme emergency as a last resort treatment.

### Materials and Methods

We conducted a descriptive retrospective study of all newborns treated with quinolone during their hospitalization in neonatal intensive care department of Mohammed VI CHU Marrakech Morocco, and this over a period of two years from January 2017 to September 2019.

The data is collected from parents with a questionnaire aimed to assess the indication, duration and side effects of ciprofloxacin.

### Results

We collected thirteen cases, which were included during the study period, including 9 girls and 4 boys. Their average age at admission was 3.7 days. Ciprofloxacin was used in 2<sup>nd</sup> line after failure of conventional antibiotic therapy in all our patients. The dose administered was 20 mg/kg twice daily in 13 infants. The average duration of intra-hospital treatment was 13 days. The treatment protocol with ciprofloxacin in our department recommends a duration of 10 to 21 days intravenously relayed orally for six to eight weeks if ventriculitis.

The indications are illustrated in Chart II, for nosocomial infection the isolated organisms were *klebsiella pneumoniae* in 3 cases, *Enterobacter cloacae* in 2 cases, the association *Klebsiella pneumoniae* with *Enterobacter cloacae* in one case and a case of *Acinetobacter baumannii*.

In our series, the 13 newborns had no side effects in intra-hospital also short term with a decline of at least 3 months.

At the end of the treatment, 9 newborns were declared cured against 4 deceased cases.

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Received Date: 16 Jun 2020

Accepted Date: 07 Jul 2020

Published Date: 13 Jul 2020

#### Citation:

Lagrine M, Bennaoui F, Idrissi Slitine N, Maoulainine FM. Ciprofloxacin in Neonatology. *Ann Pharmacol Pharm.* 2020; 5(5): 1193.

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## Discussion

Quinolone are a class of synthetic antibiotics with remarkable pharmacological properties and an antibacterial spectrum that has continued to grow with the new generations [1]. They have broad therapeutic indications but their main limitation is their contraindication in children because of the risk of occurrence of cartilaginous lesions in the child in the growth phase.

In newborns, it is sometimes necessary to break this contraindication when conventional antibiotic therapy has failed, when the germ involved neonatal infection and especially infections of nosocomial origin is multi-resistant to authorized antibiotics and/or when life-threatening is involved [2].

Several medical publications promote the use of quinolones in pediatrics and in particular neonatology given the lack of tangible evidence of a specific toxicity of quinolones in children, without declaring their total safety, be ordered to reserve them for treatment second-line in specific situations, and only under close control [1,3].

Ciprofloxacin may be a safe and effective alternative for neonatal infections that are resistant to standard treatments, despite its effects. Their side effects, and whose immutability to ciprofloxacin is uncertain.

Its use must be carefully weighed and remain exceptional. By drastically limiting their pediatric use, we will help to limit the emergence of resistance.

Dutta et al. [4] use Ciprofloxacin administered at a dose of 10 mg/kg/dose 12-hourly for 3 days or more to newborn with low birth weight have no side effects to their linear growth until 12 months corrected age.

Choi et al. [5] provides that Fluoroquinolone use should be restricted to situations in which there is no safe and effective alternative to treat an infection caused by multidrug-resistant bacteria or to provide oral therapy when parenteral therapy is not feasible and no other effective oral agent is available.

## Conclusion

Fluoroquinolone must remain in the newborn a second or third-line antibiotic in severe nosocomial infections or no other antibiotic is possible. Their side effects are rare, moderate and reversible.

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