

# Levofloxacin and Intracranial Hypertension in a Patient with Spondylodiscitis: A Case Report

A Alfieri<sup>1</sup>, G Di Caprio<sup>2</sup>,  
A Rapanà<sup>1</sup>, F Pascarella<sup>3</sup>,  
R Schettino<sup>4</sup>, C Ruggiero<sup>5</sup>  
and D Di Caprio<sup>2</sup>

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## Introduction

Pseudotumor cerebri or benign intracranial hypertension is characterized by increased intracranial hypertension without evidence of a mass lesion or ventricular obstruction. Symptoms are mainly headache and papilledema. If untreated, papilledema can cause progressive irreversible visual loss and optic atrophy. Usually occurs in obese women and in the childbearing years. It is a diagnosis of exclusion and, therefore, other causes of increased intracranial pressure must be sought with history, imaging, and cerebrospinal fluid examination before the diagnosis can be made. MRI findings include empty sella, smooth-walled venous stenoses, flattened globes and fully unfolded optic nerve sheath [1].

We describe a case of a 13 years old girl who developed L3-L4 spondylodiscitis by *Staphylococcus aureus* agent. After 2 months of levofloxacin therapy she developed intracranial hypertension, without any evidence of intracerebral mass or hydrocephalus at CT scan and MRI. The levofloxacin therapy was stopped and the symptoms disappeared after same days.

To the best of our knowledge this is the third case of intracranial hypertension associated to levofloxacin described in the literature until now [2-12], but many cases associated to fluoroquinolones have been reported [2-36].

During levofloxacin therapy it is mandatory knowing this potential complication and to screen patients by ocular fundus in case of clinical symptoms of intracranial hypertension.

## Case Report

A 13 years old girl was referred because of acute back pain and inability to walk. She has had fever (38°C) since few days. Laboratory features showed a raised C-reactive protein (CRP), high leucocyte count and *Staphylococcus aureus* bacteraemia. Spinal MRI showed decreased signal intensity from disc and adjacent vertebral bodies on T1-weighted images, increased signal intensity on T2-weighted images and Gadolinium enhancement of discs and vertebrae L3-L4 (**Figure 1**). Intravenous antibiotic therapy with levofloxacin (500 mg twice a day) and rifampicin (300 mg twice a day) was started.

Clinical symptoms improved after 1 week. The patients could walk with orthopedic bust and the blood culture after 1 week did not shows any infection. After two weeks, intravenous antibiotic

- 1 Department of Neurosurgery, AORN "S. Anna e S. Sebastiano" Caserta, Italy
- 2 Department of Infectious disease, AORN "S. Anna e S. Sebastiano" Caserta, Italy
- 3 Department of Peditry, AORN "S. Anna e S. Sebastiano" Caserta, Italy
- 4 Department of Clinical Pathology, Italian Air Force, Caserta, Italy
- 5 Department of Neurosurgery, "Santobono Pausilipon" Children Hospital, Naples, Italy

**Corresponding author:** Alessandra Alfieri

✉ alessandralfieri@yahoo.it

AORN "S. Anna e S. Sebastiano" Caserta, Italy.

**Tel:** +393738097772

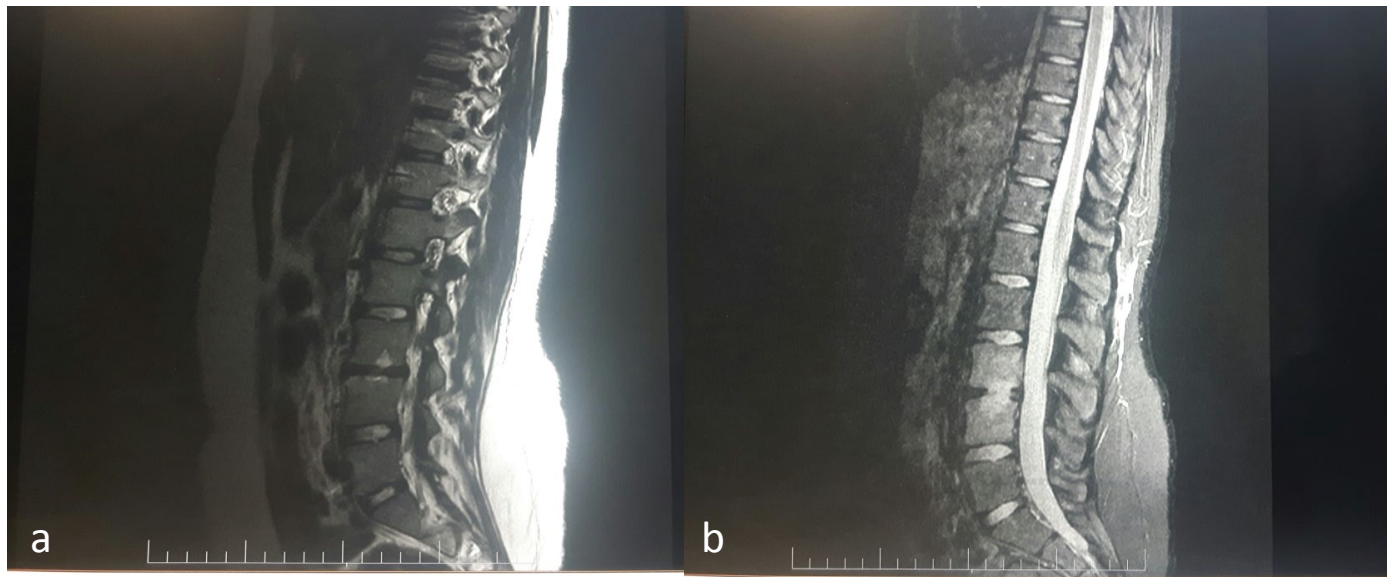
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therapy was switched on oral. After two months MRI showed still a contrast enhanced L3-L4 focus, so that the therapy was continued.

After then, the patient complained severe headache. CT scan was normal. Cerebral MRI did not show any pathological change. Fundus oculi examination showed a papilledema. An intracranial hypertension was suspected. The symptoms regressed after 1 week of levofloxacin withdrawal. After 1 month of oral rifampicin the MRI didn't show any gadolinium contrast enhancement.

## Discussion

Idiopathic intracranial hypertension is characterized by elevated intracranial hypertension with no evidence of deformity or obstruction of the ventricular system. The neurodiagnostic studies are normal except for increased fluid pressure. Patient



**Figure 1** (a) Spinal MRI showed a Gadolinium enhancement of discs and vertebrae L3 and L4 and (b) an increased signal intensity on T2-weighted images

presents headache and papilledema without neurological findings.

Many risk factors are associated to idiopathic intracranial hypertension and, between them, many evidences include drugs like nalidixic acid, lithium, amiodarone, hyper and hypovitaminosis A, sulfa antibiotics [1], tetracyclines, danazol, phenytoin, nitrofurantoin, nitroglycerin.

Since 1967 several cases of intracranial hypertension in close connection with nalidixic acid medication have been reported [3, 5-11, 14-17, 19-26, 28, 30, 32-36]. Nalidixic acid, the quinolone frequently used in the treatment of acute dysentery, has been emerging as an important cause of pseudotumor cerebri in infants and young children, especially in patients who had received a higher than recommended dose of nalidixic acid [22]. More recently others fluoroquinolones associated to the pseudotumor cerebri syndrome have been reported [2, 4, 12, 13, 17, 18, 27, 29, 37]. To the best of our knowledge we found this association in 27 cases treated with nalidixic acid [3, 5-11, 14-17, 19-26, 28, 30, 32-36], four cases with ciprofloxacin [4, 13, 27, 37], one case with ofloxacin, one case with pefloxacin [18], one with moxifloxacin [29] and two cases with levofloxacin [2, 12].

Lardizabal reported a case of a 15 year old boy who developed intracranial hypertension after 3 weeks of levofloxacin intake [2].

Recently Van der Laan et al. described a secondary intracranial hypertension in a Child with multidrug-resistant tuberculosis [12]. In one case moxifloxacin induced severe mental confusion and dementia which remained for more than two months after discontinuation [29].

The mechanism of quinolone-induced intracranial hypertension is uncertain, but probably it is related to decrease CSF absorption in the subarachnoid space. The onset of intracranial hypertension is variable, after a few days or several weeks of treatment initiation.

There are no published standard guidelines for the duration of the antibiotic therapy in spondylodiscitis. It is generally recommended to administer the antibiotics for at least two to four weeks and parenterally – as the bioavailability is usually better then. In our case the persistence, after two months, of gadolinium enhancement at MRI, induced us to continue oral antibiotic therapy.

Because a misdiagnosed rose intracranial hypertension can lead to worse visual prognosis, during levofloxacin and fluoroquinolones therapy it is mandatory knowing this potential complication and to screen patients by ocular fundus in case of severe headache and/or clinical symptoms of intracranial hypertension.

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