

# Fluoroquinolone Ciprofloxacin Should be Avoided in the Elderly

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**Abstract:- The fluoroquinolone ciprofloxacin is a potent antibiotic with proven efficacy against both gram-positive and especially gram-negative organisms. Because of its potent activities and successes, it has found tremendous clinical use in conditions of upper and lower respiratory tract infections, urinary tract infections, gastrointestinal tract infections, and many other soft tissue infections. It is not recommended for use in patients below 12 years due to the danger of damage to growing cartilage and arthropathy. Tendonitis is a recognized side effect of ciprofloxacin and said to be rare, potentially more serious in adults where it is reported to lead to tendon rupture in high-risk patients of advanced age, renal insufficiency and concurrent steroid use.**

**The following case reports not only confirm the gravity of this side effect in the elderly but also the frequency of occurrence. This necessitates attention and urgent need for vigilance and reassessment of ciprofloxacin use in the elderly. If further investigations and reports support this, then the use of Ciprofloxacin in the elderly should be avoided.**

## I. INTRODUCTION

Ciprofloxacin is a quinolone antibiotic whose mechanism of action is DNA gyrase enzyme inhibition. It has recorded high success rates and uses in the treatment against many gram-negative and gram-positive organisms infecting most systems of the body. It has distinctive microbiological features, which include: bactericidal activity and high potency, low frequency of mutational resistance, low propensity to select plasmid type resistant mutants, high activity against many B- lactam and aminoglycoside resistant bacteria, (Tripathi, KD, 2013). But like all drugs, it has some side effects some of which preclude its use in children less than 12 years by most practitioners, (Katsung, BG et al, 2012).

However, some of its recorded side effects are overlooked in practice, which unfortunately lead to fatality. This is because the practitioners are not watchful or vigilant for this side effect and many have not associated the fatality of the side effects to ciprofloxacin. Ciprofloxacin and other fluoroquinolones are said to have good safety record, side effects occurring in about 10% of patients and generally mild, withdrawal is needed in 1.5%. But tendonitis and tendon

rupture are well recognized and documented in the original side effects, (Katsung B G, et al, 2012). The risk of tendon damage is high above 60 years (Tripathi KD, 2013). The gravity of this tendon damage in patients above 60 years is underestimated and not taken into consideration by most practitioners. However, in reality this is a very serious effect with fatal consequences, and must be recognized by medical practitioners. This calls for serious auditing and follow up of patients treated with Ciprofloxacin, especially above 60 years. Hence the purpose of the following case reports below.

This, therefore, calls for vigilance and monitoring in the use of ciprofloxacin in the elderly bearing in mind this side effect. With enough of such evidences, the use of ciprofloxacin should be contra-indicated in the elderly.

The tendon rupture is associated with flaccid paralysis of the lower limbs making it impossible for the patient to move the lower limbs. And this effects seems to be a permanent damage and eventually fatal in the cases reported. The possibility of associated neuronal damage either at the motor centres controlling the lower limbs or at the periphery (neuromuscular junctions), needs to be investigated and elucidated, (Allen, CMC and Lueck, CJ, (1999).

The case reports presented here are expected to serve as an eye-opener for practitioners on the side effects such as tendonitis associated with ciprofloxacin when used in advanced age. Based on this report it is advisable to avoid the use of ciprofloxacin in the elderly.

### A. CASE 1: MRS. ABC 92 YEARS, FEMALE

Mrs. ABC was an elderly woman who was healthy and active until she developed sore throat and cough. She was not known to have been admitted to the hospital before. No fever or headache. Not hypertensive, diabetic or asthmatic and had no previous history of medical or/surgical condition of significance.

As she developed sore throat and cough, she was given tablet ciprofloxacin 500mg bd for 5 days. After the second dose on the evening of the first day of taking the ciprofloxacin, the patient could not get out of bed the following morning. She could not move or raise her legs. She was then admitted in the hospital without improvement of the weakness of the lower limbs. The power on the lower limbs

was less than 2. This condition continued for about two weeks, the patient was strong for the first week with vital signs within normal range but deteriorated in physical strength till she died within four (4) weeks. All manner of nerve energizers (Biopentin, Merconerve, Dolometa-B) and physiotherapy proved abortive and the patient remained paralysed and deteriorated till death.

#### B. CASE 2: CHIEF BCD 92 Years Male

The patient was a 92-year-old man with no record of hospital admission, not hypertensive or diabetic, apparently healthy and strong, and walked straight despite his age and height. He developed a slight cough for three (3) days and went to the hospital for care. There he was given ciprofloxacin and cough syrup. Within the next one week, the patient could no longer walk unaided with no postural defect, but due to loss of power in the lower limbs.

- The patient became bedridden, unable to get up and out of bed. He was taken to a Teaching Hospital in the state for further medical attention. However, within the following 3 weeks, the patient could not regain any power of the lower limbs but rather the health deteriorated getting weaker despite all medical attention given to him. The weakness was eventually complicated with urinary incontinence necessitating the use of adult pampers. No catheter was used, no history of fever during the period. The condition deteriorated further leading to loss of appetite and patient's refusal to eat. Finally, the patient lapsed into unconsciousness and eventually died. All events happened within 4 weeks.

#### C. CASE 3

The patient was an 85 year old woman, apparently healthy and strong. She developed the usual signs and symptoms of malaria. She visited the State Hospital where malaria and typhoid were diagnosed. She was subsequently given ACT and ciprofloxacin. She went home and took the drugs but before she could finish the medication, she developed weakness in her lower limbs. She was taken back to the general hospital and was admitted for five (5) days without improvement before she was referred to the Teaching Hospital in the state capital for further management. On arrival at the tertiary centre, the patient was conscious and alert but confused, greatly apprehensive, and agitated with focal seizures of the head and neck and continuous upper limb tremors. However, the vital signs were not grossly abnormal pulse 100bpm, BP 130/80mmHg, Temperature 37°C, Respiration 28c/m. She was admitted, and subsequently reviewed and managed by the medical team on call. All attempts to control the subtle seizures and tremors with Diazepam proved abortive. The tremors/seizures continued with worsening clinical state.

The patient deteriorated until she could not tolerate oral medications and food till she lapsed into unconsciousness and eventually died within 48hours of hospital admission.

## II. DISCUSSION

In the three (3) cases presented above, the patients were people who previously had no medical or surgical challenge

in life. The only denominator in the cases was the use of ciprofloxacin at that point in their life.

It is not like there was any hypersensitivity reaction to the ciprofloxacin but the acute or sudden neurological deficits manifesting as paralysis of the lower limbs, were especially classical in all three (3) cases, who had no previous history of hypersensitivity reaction.

The weakness of the lower limbs was that of flaccid paralysis. There was associated urinary and faecal incontinence over time. It appeared that the effect ascended cranially till the patient could not eat, and consciousness became altered until death within the space of 4 weeks. The effect was primarily a motor-neuron defect, as sensations were still retained even on the lower limbs initially.

## III. CONCLUSION/RECOMMENDATION

From the above reported cases (many more apparently missed), it is likely that many such events have passed unnoticed over the years across many parts of the world especially Africa. There is serious need to apply strict caution, observation and monitoring of the use of Ciprofloxacin in the elderly. It is believed that with adequate awareness and monitoring, enough evidence would be made available for the possible contra-indication of the use of Ciprofloxacin in the elderly. In the similar manner, efforts should be made to elucidate the mechanism of the effect for better understanding and prevention.

## ACKNOWLEDGEMENT

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