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**Dr. Shreesha Khandige**  
Professor and HOD,  
Department of Pathology,  
Kanachur Institute of Medical  
Sciences, Mangalore,  
Karnataka, India

**Dr. B Vasudeva Somayaji**  
Associate Professor,  
Department of Pathology,  
Kanachur Institute of Medical  
Sciences, Mangalore,  
Karnataka, India

**Corresponding Author:**  
**Dr. B Vasudeva Somayaji**  
Associate Professor,  
Department of Pathology,  
Kanachur Institute of Medical  
Sciences, Mangalore,  
Karnataka, India

## A study of association of fluoroquinolones in tendon pathology

**Dr. Shreesha Khandige and Dr. B Vasudeva Somayaji**

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### Abstract

Fluoroquinolones are the quinolone antimicrobials, which are known to have one or more fluorine substitutions. The first generation fluoroquinolones, which was introduced in 1980s have one fluoro substitution. This was very effective in cases of gram-negative bacterias.<sup>1</sup> In the 1990s, compounds with additional fluoro and other substitutions have been developed further extending antimicrobial activity to grampositive cocci and also anaerobes, which also has higher metabolic stability.<sup>2,3,4</sup> The present topic of controversy is tendinopathy and tendon rupture induced by fluoroquinolone. There is enough data, which suggest that fluoroquinolones should be used with utmost care in population of patients.<sup>5</sup> That means not all the patients with gram-negative infections can be given this antibiotic as it has its own side effects. The first one to publish report was that of a fifty-six-year-old patient who had urinary tract infection and was treated with norfloxacin.

**Keywords:** Fluoroquinolones, tendinitis, tendon rupture

### Introduction

Fluoroquinolones are the quinolone antimicrobials, which are known to have one or more fluorine substitutions. The first generation fluoroquinolones, which was introduced in 1980s have one fluoro substitution. This was very effective in cases of gram-negative bacterias<sup>[1]</sup>. In the 1990s, compounds with additional fluoro and other substitutions have been developed further extending antimicrobial activity to grampositive cocci and also anaerobes, which also has higher metabolic stability<sup>[2, 3, 4]</sup>. The present topic of controversy is tendinopathy and tendon rupture induced by fluoroquinolone. There is enough data, which suggest that fluoroquinolones should be used with utmost care in population of patients<sup>[5]</sup>. That means not all the patients with gram-negative infections can be given this antibiotic as it has its own side effects. The first one to publish report was that of a fifty-six-year-old patient who had urinary tract infection and was treated with norfloxacin. The patient developed Achilles tendinopathy and the associated rupture was reported in New Zealand in the year 1983<sup>[6]</sup>. Subsequently, there were many other case reports and case-controlled studies reporting similar findings<sup>[7-9]</sup>. Fluoroquinolone are commonly prescribed to treat community-acquired infections involving the respiratory, urogenital and gastrointestinal tracts<sup>[10]</sup>. Fluoroquinolone concentration is seen on a higher scale in bones and joints when compared to the serum levels. So, it is ideal to treat the bones and joint infections<sup>[11]</sup>. The cartilage infections is also treated with fluoroquinolone. Achilles tendinitis or rupture is among the most serious side effects associated with fluoroquinolone<sup>[12, 13]</sup>.

### Aims and objectives

To study the association of fluoroquinolones in tendon pathology.

### Materials and methods

Ten patients were selected. Gender-based statistical analysis was not done as female patients were very low in number.

### Inclusion criteria

1. Only positive use of fluoroquinolone drugs if present in the past history was taken for the study.

**Exclusion criteria**

1. Injuries and other trauma cases were not considered.
2. Negative fluoroquinolone drugs usage history was not considered.

The study was done from Nov 2019 to March 2020 in the Department Pathology, Kanachur Institute of Medical Sciences, Mangalore.

Biopsy was taken from the tendocalcaneus and studied.

**Results****Table 1:** Age Distribution

Mean Age	Std. Deviation
44.19 years	±2.37 years

**Table 2:** Sex Distribution

Male	Females
07	03

**Table 3:** Tendonitis and Tendon Rupture

Condition	Incidence	X <sup>2</sup> value	Significance
Calf muscles pain	10	6.83	<0.001 (Sig)
Tendonitis	06	4.83	0.212 (Not Significant)
Tendon Rupture	04	0.161	0.872 (Not Significant)

Under microscope signs of degeneration was observed.

**Discussion**

Some fluoroquinolones may weaken the tendons in the shoulder, hand, or heel, making the tendons more likely to tear. Anyone who notices pain or inflammation in these or other tendon areas should stop taking the medicine immediately and call a physician. Rest and avoid exercise until the physician determines whether the tendons are damaged. If the tendons are torn, surgery may be necessary to repair them.

These medicines make some people feel drowsy, dizzy, lightheaded, or less alert. Anyone who takes these drugs should not drive, use machines or do anything else that might be dangerous until they have found out how the drugs affect them.

This medicine may increase sensitivity to sunlight. Even brief exposure to sun can cause a severe sunburn or a rash. While being treated with fluoroquinolones, avoid being in direct sunlight, especially between 10 a.m. and 3 p.m.; wear a hat and tightly woven clothing that covers the arms and legs; use a sunscreen with a skin protection factor (SPF) of at least 15; protect the lips with a sun block lipstick; and do not use tanning beds, tanning booths or sunlamps.

Do not take antacids that contain aluminum, calcium, or magnesium at the same time as fluoroquinolones. The antacids may keep the fluoroquinolones from working as they should. If antacids are needed, take them at least two hours before or two hours after taking norfloxacin or ofloxacin, at least four hours before or two hours after taking ciprofloxacin. Follow the same instructions for taking sucralfate (Carafate), a medicine used to treat stomach ulcers and other irritation in the digestive tract and mouth.

Anyone who has had unusual reactions to fluoroquinolones or related medicines such as cinoxacin (Cinobac) or nalidixic acid (NegGram) in the past should let his or her physician know before taking the drugs again. The physician should also be told about any allergies to foods, dyes,

preservatives or other substances.

**Conclusion**

The side effects are present and so this drug should be used judiciously.

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