Am J Sports Med. 2000 May-Jun;28(3):364-9.

The effect of ciprofloxacin on tendon, paratenon, and capsular fibroblast metabolism.

Williams RJ 3rd, Attia E, Wickiewicz TL, Hannafin JA.

Source

Laboratory for Soft Tissue Research, Sports Medicine & Shoulder Service, Hospital for Special Surgery, New York, New York, USA.

Abstract

The pathologic mechanisms underlying fluoroquinolone-induced tendinopathy are poorly understood. The observed incidence of tendinitis and tendon rupture in patients treated with ciprofloxacin hydrochloride suggests that the fluoroquinolone antibiotics alter tendon fibroblast metabolism. The purpose of this study was to examine the effect of ciprofloxacin on fibroblast metabolism in vitro. Canine Achilles tendon, paratenon, and shoulder capsule specimens were maintained in culture with ciprofloxacin (5, 10, or 50 microg/ml). Fibroblast proliferation, collagen synthesis, proteoglycan synthesis, and matrix-degrading activity were analyzed. Incubation of Achilles tendon, Achilles paratenon, and shoulder capsule fibroblasts with ciprofloxacin resulted in a statistically significant 66% to 68% decrease in cell proliferation compared with control cells at day 3 in culture. Ciprofloxacin caused a statistically significant 36% to 48% decrease in collagen synthesis compared with controls in all fibroblast cultures. Ciprofloxacin caused a statistically significant 14% to 60% decrease in proteoglycan synthesis in all fibroblast cell lines. Compared with unstimulated control fibroblasts, culture media from Achilles tendon, paratenon, and shoulder capsule cells that were exposed to ciprofloxacin demonstrated statistically significant increases in matrix-degrading proteolytic activity after 72 hours in culture. This study demonstrates that ciprofloxacin stimulates matrix-degrading protease activity from fibroblasts and that it exerts an inhibitory effect on fibroblast metabolism. The increase in protease activity and the inhibition of both cell proliferation and the synthesis of matrix ground substance may contribute to the clinically described tendinopathies associated with ciprofloxacin therapy.

Comment in

- Am J Sports Med. 2001 Mar-Apr;29(2):262-3.

PMID:
10843129
[PubMed - indexed for MEDLINE]

MeSH Terms, Substances

LinkOut - more resources

South Med J. 2000 May;93(5):488-91.

Quinolones and tendon ruptures.

Casparian JM, Luchi M, Moffat RE, Hinthorn D.

Source

Department of Medicine, University of Kansas Medical Center, Kansas City 66160-7319, USA.

Abstract

We report two cases of tendon rupture associated with ciprofloxacin. One patient had a complete rupture of an Achilles tendon 6 months after taking the medication. The other case involved a partial rupture of the subscapularis tendon. Both ruptures occurred with minimal mechanical stress on the tendons, suggesting that the fluoroquinolone increased the susceptibility to rupture. We also review the literature describing the association between fluoroquinolones and tendon rupture and discuss the mechanisms explaining the heightened risk of tendon rupture associated with these drugs.

Comment in

- South Med J. 2000 May;93(5):525-6.

PMID:
10832946
[PubMed - indexed for MEDLINE]

Foot Ankle Int. 1997 May;18(5):297-9.

Pathology of the Achilles tendon in association with ciprofloxacin treatment.

Movin T, Gad A, Güntner P, Földhazy Z, Rolf C.

Source

Department of Orthopedics, Huddinge University Hospital, Sweden.

Abstract

Achilles tendon pain or rupture after fluoroquionolone treatment has been described as an uncommon adverse effect. We report two patients with ciprofloxacin-associated Achilles tendon disease, one with histopathological examination. Microscopic evaluation showed irregular collagen fiber arrangement, hypercellularity, and increased interfibrillar glycosaminoglycans. These pathological features are also seen in tendon overuse injuries in athletes.

PMID:
9167931
[PubMed - indexed for MEDLINE]

Hosp Med. 2004 May;65(5):308-9.

Bilateral simultaneous spontaneous rupture of the Achilles tendon.

Mehra A, Maheshwari R, Case R, Croucher C.
Source

Weston General Hospital, Weston Super Mare.

PMID:
15176150
[PubMed - indexed for MEDLINE]

The pharmacological management of drug-induced rheumatic disorders.

di Fazano CS, Bertin P.
Source

Department of Rheumatology and Therapeutic, University Hospital Dupuytren, Limoges, France.

Abstract

Many drugs can induce adverse effects such as rheumatoid disorders, which we need to be aware of in order to best detect and manage them. New drugs are constantly entering the marketplace and can cause an increasing number of disorders. Through this article, we review the prevention and pharmacological management of drug-induced rheumatic disorders. These include articular and peri-articular manifestations induced by fluoroquinolones, retinoids, cyclosporin, drug-induced disorders of bone metabolism such as corticosteroid-induced osteoporosis and drug-induced osteomalacia, and multisystemic manifestations including drug-induced lupus and arthritis induced by vaccinations and cytokines.

PMID:
11825305
[PubMed - indexed for MEDLINE]

Ann Pharmacother. 1993 Sep;27(9):1058-9.

Neurologic adverse effects during concomitant treatment with ciprofloxacin, NSAIDS, and chloroquine: possible drug interaction.

Rollof J, Vinge E.

Source

Department of Infectious Diseases, Lund University Hospital, Sweden.

Abstract

OBJECTIVE:

To report a case of neurologic adverse effects that developed during concomitant treatment with ciprofloxacin, nonsteroidal antiinflammatory drugs (NSAIDs), and chloroquine. Possible mechanisms for a drug interaction are discussed.

CASE SUMMARY:

A 68-year-old woman who was receiving chronic treatment with NSAIDs and chloroquine developed dizziness, anxiety, and tremors when ciprofloxacin 500 mg twice daily was begun for Salmonella osteitis. When she discontinued the antirheumatic treatment, there was a prompt relief of symptoms. After indomethacin was reintroduced, the patient developed signs and symptoms of peripheral neuropathy, which partially subsided when ciprofloxacin was discontinued.

DISCUSSION:

Enhanced neurologic adverse effects of ciprofloxacin when taken together with NSAIDs or chloroquine may result from reduced effects of gamma-aminobutyric acid. An alternative explanation could be that NSAIDs and chloroquine impair the elimination of ciprofloxacin, thereby contributing to toxic concentrations of the antibiotic.

CONCLUSIONS:

The possibility of interactions between ciprofloxacin and antirheumatic drugs should be considered.

PMID:
8219437
[PubMed - indexed for MEDLINE]

Disturbance of cellular glucose transport by two prevalently used fluoroquinolone antibiotics ciprofloxacin and levofloxacin involves glucose transporter type 1

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- Received 8 August 2008. Revised 20 October 2008. Accepted 21 October 2008. Available online 28 October 2008.
- http://dx.doi.org/10.1016/j.toxlet.2008.10.017, How to Cite or Link Using DOI
- Cited by in Scopus (2)

Abstract

Dysglycemia and central nervous system (CNS) complications are the known adverse effects of fluoroquinolone antibiotics. Ciprofloxacin and levofloxacin are among the most prescribed antibiotics. In this study we demonstrate that ciprofloxacin and levofloxacin disturb glucose transport into HepG2 cells and such inhibition is associated with inhibited glucose transporter type 1 (GLUT1) function. When exposed to ciprofloxacin or levofloxacin at maximum plasma concentrations (C_{max}) and 5× of C_{max} concentrations, GLUT1 mRNA expression, cell surface GLUT1 protein expression and glucose uptake were significantly reduced. These findings imply that disturbed cellular glucose transport and GLUT1 function may underlie the dysglycemic and CNS effects of ciprofloxacin and levofloxacin.

Pharmacol Toxicol. 1989 May;64(5):404-11.

Neurochemical studies on quinolone antibiotics: effects on glutamate, GABA and adenosine systems in mammalian CNS.

Dodd PR, Davies LP, Watson WE, Nielsen B, Dyer JA, Wong LS, Johnston GA.

Source

Department of Pharmacology, University of Sydney, N.S.W., Australia.

Abstract

Quinolone antibiotics, which can be proconvulsant in susceptible patients, were found to inhibit the specific binding of the adenosine receptor ligands L-3H-N6-phenylisopropyladenosine (L-3H-PIA) and 3H-N-ethylcarboxamidoadenosine (3H-NECA) to rat brain synaptic membranes. The inhibitions were concentration dependent, and for both ligands the order of potency was rosoxacin greater than nalidixic acid greater than oxolinic acid greater than or equal to ciprofloxacin greater than norfloxacin greater than enoxacin: IC20 values (concentrations causing a 20% inhibition of

specific binding) ranged from 30-35 microM to 1-3 mM. Hill coefficients were approximately 0.5, suggesting that the compounds are probably antagonists at these sites. Most of the compounds did not alter 3H-diazepam binding directly, although rosoxacin showed relatively strong, and enoxacin weak, concentration-dependent inhibition. At 50 microM the compounds enhanced the maximal gamma-aminobutyric acid (GABA) activation of 3H-diazepam binding to varying degrees, without altering the EC50 of activation, whereas at 200 microM they tended to reduce GABA activation. Most noteworthy was the large increase in GABA-stimulated 3H-diazepam binding caused by 50 microM nalidixic acid. The compounds did not alter the Ca2+/Cl- -dependent binding of 3H-glutamate, nor of the binding of the glutamate site-selective ligands 3H-kainate and alpha-3H-amino-3-hydroxy-5-methylisoxazole-4-propionic acid (3H-AMPA); the uptake of the non-metabolized glutamate analogue D-3H-aspartate by cortical homogenates was also unaffected. The CNS side effects of these antibiotics may result, in part, from interaction with sites which mediate the inhibitory neurotransmission of adenosine and, possibly, GABA.

PMID:
2771865
[PubMed - indexed for MEDLINE]

Photodermatology Photoimmunology & Photomedicine
THE OFFICIAL PUBLICATION OF THE PHOTOMEDICINE SOCIETY AND THE BRITISH PHOTODERMATOLOGY GROUP

Photolocalized purpura during ciprofloxacin therapy

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Article first published online: 14 MAR 2006

DOI: 10.1111/j.1600-0781.2006.00210.x

Photosensitivity reactions reported with ciprofloxacin mimic those of sunburn, with erythema and edema in the milder forms, and painful blistering with subsequent peeling when severe. Purpuric eruptions during treatment with ciprofloxacin have been rarely reported. We describe a 30-year-old man who was given a 15-day course with ciprofloxacin 500 mg twice a day for a prostatitis. Coinciding with sun exposure, he developed a purpuric, pruriginous eruption on his lower extremities, consisting of erythematous, petechial lesions located on the anterior aspect of his thighs and legs, clearly delimited by his bathing suit. The lesions cleared completely after the discontinuation of the drug and treatment with topical clobetasol. The acute reaction observed in our patient differed from a classical sunburn, consisting of confluent petechias, strictly limited to sunlight-exposed areas, and accompanied by pruritus. Photoexposed purpuric eruptions should be considered as another side effect of ciprofloxacin therapy in addition to phosensitivity rashes.

Dermatology. 1997;195(2):173-5.

Ciprofloxacin-induced toxic epidermal necrolysis: a case report.

Livasy CA, Kaplan AM.
Source

Department of Pathology, University of North Carolina Hospitals, Chapel Hill 27599-7525, USA.

Abstract

Toxic epidermal necrolysis (TEN) is an uncommon fulminating mucocutaneous disease associated with marked morbidity and mortality. While sometimes idiopathic, TEN is frequently associated with drug administration. We report a well-documented fatal case of ciprofloxacin-induced TEN in a 50-year-old man treated for a bacterial infection of lower extremity venous stasis ulcers. To our knowledge, a total of 6 cases have been reported in the literature documenting an association between oral ciprofloxacin administration and TEN or Stevens-Johnson syndrome. The patient in this case had no prior medical conditions known to cause TEN, was not being treated with any medication other than ciprofloxacin (500 mg b.i.d.) and developed the clinical symptoms of TEN in a time course compatible with drug-induced TEN. This case provides strong evidence for the culpability of ciprofloxacin in the development of TEN.

PMID:
9310730
[PubMed - indexed for MEDLINE]

Ann Pharmacother. 2001 Dec;35(12):1540-7.

Peripheral neuropathy associated with fluoroquinolones.

Cohen JS.
Source

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Abstract

OBJECTIVE:

To survey cases of fluoroquinolone-associated adverse events that included peripheral nervous system (PNS) symptoms posted on Internet Web sites.

METHODS:

Cases were obtained with the assistance of members of Web sites formed by people sustaining fluoroquinolone-related events. Information obtained met the standards of MedWatch, and each reported case was assessed using the Naranjo probability scale.

RESULTS:

In contrast to previous reports suggesting that fluoroquinolone-associated PNS events are mild and short-term, 36 of the 45 cases reported severe events that typically involved multiple organ systems. Although many newer cases are still evolving, symptoms had lasted more than three months in 71% of cases and more than one year in 58%. Onset of adverse events was usually rapid, with 15 (33%) events beginning within 24 hours of initiating treatment, 26 (58%) within 72 hours, and 38 (84%) within one week. Sixty courses of fluoroquinolones were prescribed: levofloxacin (n = 33 cases), ciprofloxacin (n = 11), ofloxacin (n = 6), lomefloxacin (n = 1), trovafloxacin (n = 1); in eight cases the same antibiotic was prescribed twice.

CONCLUSIONS:

These cases suggest a possible association between fluoroquinolone antibiotics and severe, long-term adverse effects involving the PNS as well as other organ systems. The severity of these cases may reflect a different population than typically reported to drug companies or MedWatch, which often originate from healthcare providers. In contrast, Internet Web sites may provide a forum for patients experiencing adverse effects that have not resolved promptly. Further study is warranted. Meanwhile the occurrence of PNS symptoms during fluoroquinolone therapy should prompt immediate discontinuation of the agent used.

Comment in

- Ann Pharmacother. 2001 Dec;35(12):1673-4.
- Am J Nurs. 2002 Jun;102(6):13; author reply 13.

PMID:
11793615
[PubMed - indexed for MEDLINE]

MeSH Terms, Substances

LinkOut - more resources

Int J Antimicrob Agents. 2007 Apr;29(4):374-9. Epub 2007 Jan 22.

Arrhythmias associated with fluoroquinolone therapy.

Falagas ME, Rafailidis PI, Rosmarakis ES.

Source

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Abstract

Fluoroquinolones are widely used and well tolerated antibacterial agents. However, prolongation of the QT interval is an adverse effect associated with the use of fluoroquinolones. According to the available case reports and clinical studies, moxifloxacin carries the greatest risk of QT prolongation from all available quinolones in clinical practice and it should be used with caution in patients with predisposing factors for Torsades de pointes (Tdp). Although gemifloxacin, levofloxacin and ofloxacin are associated with a lower risk of QT prolongation compared with moxifloxacin, they should also be used with caution in patients with risk factors for QT prolongation. Ciprofloxacin appears to be associated with the lowest risk for QT prolongation and the lowest rate of Tdp. The overall risk of Tdp is small with the use of fluoroquinolones. Clinicians can minimise that risk by avoiding prescriptions of multiple medications associated with QT interval prolongation, especially in high-risk patients.

PMID:
17241772
[PubMed - indexed for MEDLINE]

Intrinsic cytotoxic effects of fluoroquinolones on human corneal keratocytes and endothelial cells

2008, Vol. 24, No. 2 , Pages 419-424

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ABSTRACT

Objective: To determine the intrinsic cytotoxicity of five fluoroquinolones (ciprofloxacin, gatifloxacin, levofloxacin, moxifloxacin, ofloxacin) on human corneal keratocytes (HCK) and human corneal endothelial cells (HCE).

Research design and methods: Cultures of replicating HCK and HCE were exposed to ciprofloxacin, gatifloxacin, levofloxacin, moxifloxacin, or ofloxacin concentrations of 1 mg/mL, 100 µg/mL, 10 µg/mL, 1 µg/mL, 100 ng/mL, or 10 ng/mL for 15, 30, 60, or 240 min. Each of the 24 fluoroquinolone concentration–time exposures was tested against its own serum-free minimal essential medium (MEM) control. Cell number was quantified with a fluorescence bioassay.

Main outcome measure: Cytotoxicity was defined as a significant ($p < 0.05$) difference in cell number measured as mean calcein fluorescence product versus control for each fluoroquinolone concentration–time exposure.

Results: Fluoroquinolone-induced cytotoxicity was concentration- and time-dependent in HCK and HCE cultures. The number of cytotoxic concentration–time exposures was highest with ciprofloxacin (23 of 24 exposures in HCK and 24 of 24 exposures in HCE) and lowest with levofloxacin (10 of 24 exposures in both HCK and HCE).

Conclusions: In vitro cell cultures are useful for evaluating cell response to potentially toxic insults, although cell cultures may lack tissue components that may prevent or ameliorate damage *in vivo*. In this assay, fluoroquinolones displayed the potential to be cytotoxic to human corneal keratocytes and endothelial cells, depending on drug

concentration and duration of exposure. The potential for cytotoxicity may differ among fluoroquinolones.

Read More: http://informahealthcare.com/doi/abs/10.1185/030079908X261005

http://www.ncbi.nlm.nih.gov/sites/entrez?cmd=Link&db=pubmed&dbFrom=PubMed&from_uid=11292056

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