Vascular remodelling or arterial stiffness in ciprofloxacin-treated mice: is fluoroquinolone-induced aortic dilation an inflated issue?

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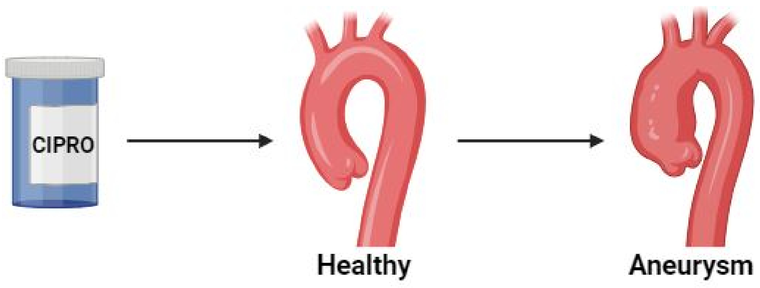
INTRODUCTION

Fluoroquinolone antibiotics induce changes in collagen synthesis and increase risk of tendon ruptures. Given the significance of collagen within the aorta, fluoroquinolones may interfere with arterial wall remodelling. More specifically, ciprofloxacin has been associated with a increased risk of aortic aneurysms and dissections resulting in an FDA black box warning.



AIMS

Investigate the potential of arterial stiffness as an early marker of ciprofloxacin-induced vascular remodeling, in addition to validating prior evidence in pre-clinical mice models.

METHODS

The study included three distinct conditions: healthy, hypertensive, and Marfan. In these experiments, 12-week-old male mice were administered ciprofloxacin (100 mg/kg/day via drinking water) or vehicle for two periods of two weeks. Arterial stiffness (Ep) and aortic diameter were measured both *in vivo* as well as *ex vivo*.

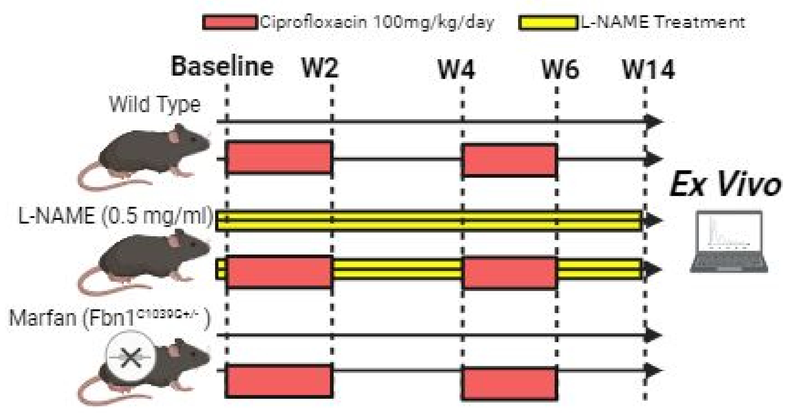


Figure 1. In vivo study design overview.

Figure 4. Confirmation of clinically relevant ciprofloxacin plasma concentrations.

RESULTS

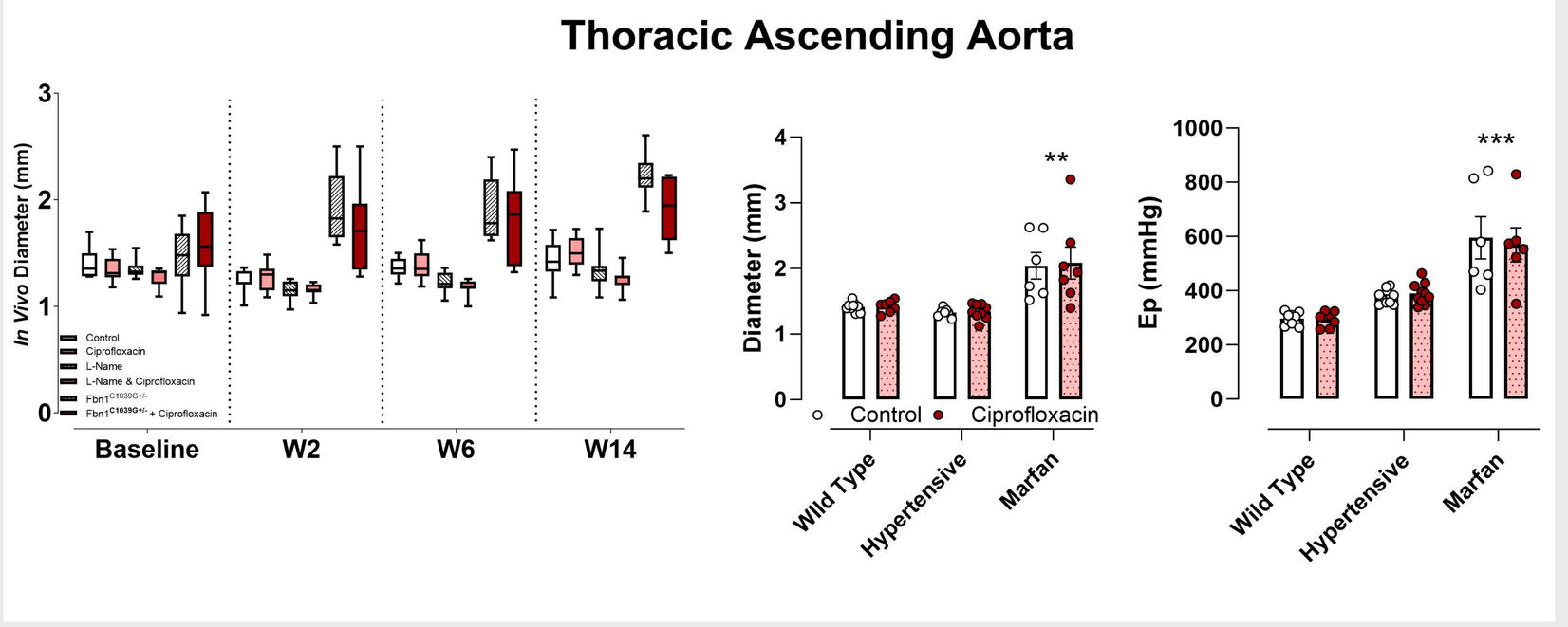


Figure 2. Ciprofloxacin did not exacerbate aortic dilation or arterial stiffness of the thoracic ascending aorta *in vivo* as well as *ex vivo* in healthy WT, L-NAME-induced hypertensive and Marfan mice. **Ep**= Peterson's elastic modulus.

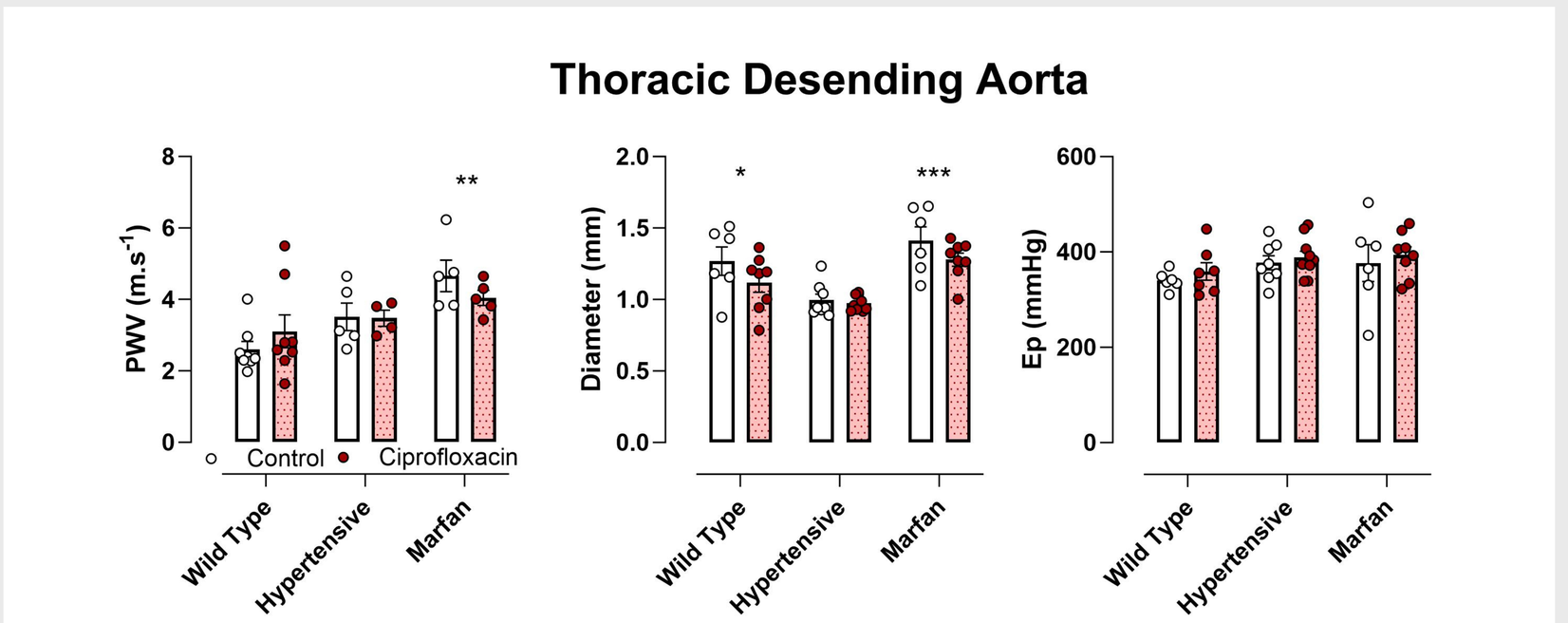


Figure 3. Ciprofloxacin does not induce arterial stiffness or aneurysm formation *in vivo as well as ex vivo* in the thoracic descending aorta of healthy WT, L-NAME-induced hypertensive and Marfan mice. **PWV** = pulse wave velocity, **Ep**= Peterson's elastic modulus.

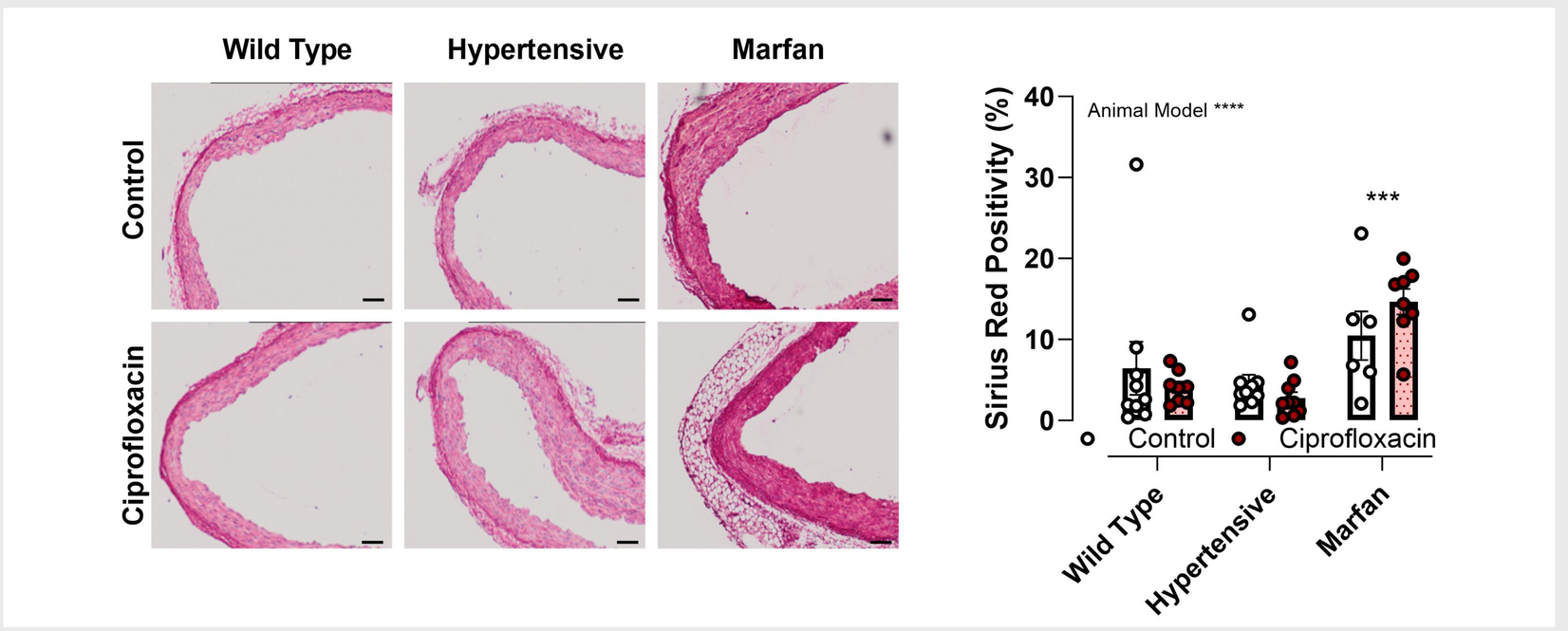


Figure 5. Ciprofloxacin does not alter total collagen in the thoracic ascending aorta of healthy WT, L-NAME-induced hypertensive and Marfan mice.

CONCLUSION

Overall, this study did not confirm the involvement of ciprofloxacin on vascular remodelling and aneurysm formation when administered in clinically relevant dosages (confirmed via blood plasma measurement) and exposure times, which contrasts previous reports in patients and mice.

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