The association between oral fluoroquinolone use and the development of retinal detachment: a systematic review and meta-analysis of observational studies

CSL Chui, ICK Wong, LYL Wong, EW Chan. Centre for Safe Medication Practice and Research, Department of Pharmacology and Pharmacy, The University of Hong Kong, Hong Kong, Hong Kong

**Background:** In 2012, Etminan et al (1) published a study on the association between the use of oral fluoroquinolones and the subsequent development of retinal detachment. They reported a significant association among current fluoroquinolones users with an adjusted rate ratio of 4.50 (95% CI 3.56-5.70) as compared to non-users. Non-significant results were observed among recent and past users. A number of more observational studies were published afterwards; however, those findings are not consistent. The aim of this systematic review and meta-analysis is to investigate the association between the use of oral fluoroquinolones and the subsequent development of retinal detachment and estimate the overall absolute risk of such event among current fluoroquinolones users (up to 10 days from the first day of fluoroquinolones prescription).

**Methods:** Electronic databases such as Pubmed, EMBASE and CINAHL were searched for studies relevant to the association between the use of oral fluoroquinolones and the development of retinal detachment up to August 2014. Observational studies with cohort, case-control and self-controlled case series study designs were included in the systematic review. Statistics relevant to the measure of the association were extracted from the relevant studies for meta-analysis or absolute risk calculation. The number of cases of retinal detachment occurred during current fluoroquinolones use were extracted for absolute risk calculation. Studies which did not meet the criteria for meta-analysis were narratively reviewed.

**Results:** A total of 695 recorded were found from the literature search. After removal of duplications and screening for relevance, 7 of them were included in this systematic review. Three out of the 7 studies were included in the meta-analysis and the other 4 studies were narratively reviewed. The meta-analysis of the case-control studies resulted in a rate ratio of 1.82 (95% CI 0.67-4.93), P<0.001, $I^2$=96% whilst the one for self-controlled case series resulted in an incidence rate ratio of 1.03 (95% CI 0.84-1.27), P=0.20, $I^2$=36%. The studies that were narratively reviewed were all of cohort study design. Three of the 4 studies reported non-significant association between oral fluoroquinolone use and the development of retinal detachment. Five studies had enough information for the absolute risk calculation. The pooled absolute risk was 4.85 per 1,000,000 prescriptions (95% CI 0.78 – 8.91) among current fluoroquinolones users.

**Conclusion:** The finding of this systematic review and meta-analysis does not support the association between oral fluoroquinolones use and the development of retinal detachment. Based on the low absolute risk estimated, the occurrence of retinal detachment will be rare if there were an association. The current practice of fluoroquinolones prescribing should not be altered based on the finding of this study.
Reference: