THE TALE OF INTRAOCULAR CEFUROXIME
LA HISTORIA DE LA CEFUROXIMA INTRAOCULAR

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Recently, the European Cataract and Refractive Surgery Society (ESCRS) published the results of a multi-center, randomized, prospective and controlled study, flawlessly designed and utilizing intra-chamber cefuroxime and the reduction of the prevalence of post-surgical endophthalmitis (1,2). The study, with the participation of 24 hospitals from 9 countries including Spain, recruited over 16,000 patients up to 2005, of which 13,698 completed the study. The preliminary results seemed so conclusive that it was decided to distribute its results at an early stage: the prevalence of endophthalmitis in the group of 6,862 patients who did not receive cefuroxime, was of 23 vis-à-vis the 5 times lower prevalence in the group which did receive it: only 5 cases out of 6,836. In the light of these clinically and statistically significant results, the authors proposed the routine utilization of this prophylactic measure by all ophthalmologists.

However, the history of the application of intra-chamber cefuroxime goes back a few years. In 2002, Montan, a Swedish ophthalmologist, developed in Stockholm’s St. Erik Hospital an intra-chamber injection in a 1 mg bolus of cefuroxime in a 0,1 ml solution at the end of the phacoemulsification (3). He decided to test it due to the significant increase in his hospital of endophthalmitis after cataract surgery in spite of prophylaxis with subconjunctival antibiotics. The initial trials seemed to prove cefuroxime as a safe antibiotic for the endothelium which did not cause allergies or intraocular inflammation.

The technique was established as a routine in Sweden, enrolling over 300,000 patients. The conclusion that this practice prevented a majority of post-surgical endophthalmitis was based on retrospective non-controlled studies. The risk of endophthalmitis was said to be 5-7 times lower in the group treated with cefuroxime vis-à-vis the group which did not receive it. In addition, it was seen that the micro-organisms responsible for ocular infections in the treated group were resistant to cefuroxime.

As the utilization of intra-chamber cefuroxime seemed so encouraging it was decided to carry out in Europe the randomized, multi-center prospective study controlled by ESCRs with the extremely positive results for cefuroxime described above. This second-generation cephalosporine is highly active against the main pathogens which account for endophthalmitis: staphilococci (excepting Staphylococcus aureus resistant to meticilline), streptococci, Propionibacterium acnes and the majority of Gram-negative bacilli (except Pseudomonas sp.). In addition, as an antibiotic if adequately meets the criteria for ocular prophylaxis: it is efficient, it covers an adequate range, it is relatively cheap and does not cause toxicity.

On the other hand, cefuroxime is characterized by the low rate of inducement of bacterial resistance, a crucial problem in medicine. Faced with the possibility of utilizing another type of wider ranging antimicrobial with more intrinsic activity than cefuroxime for surgical prophylaxis of endophthalmitis, it is suggested not to do it in a routine manner because said useful alternative will be weakened or even exhausted if it becomes necessary to treat a more severe endophthalmitis (4).

To this date there is no other controlled, prospective scientific study which demonstrated a prophylactic effect on endophthalmitis with the administration of antibiotics through other pathways, including antibiotic in irrigation serum. It has been usual practice to utilize serum with vancomycine and aminoglicosides in the infusion liquid, but this

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practice involved a risk of toxicity, above all with gentamycine, as well as the danger of developing resistance, mainly with vancomycine, which should be considered as a reserve medication. For these reasons, several scientific societies question and even advise against the use of this prophylaxis: the Center for Disease Control in 1995 and the American Academy of Ophthalmology in 1999 issued warnings against the use of vancomycine and May in 2000 against aminoglycosides.

The paradox with cefuroxime is that, even though it has proved its efficiency in the above mentioned clinical study, the latter seems the opposite of a perfect clinical study because it deals with an antimicrobial which was not initially conceived for intraocular use (it was not marketed in intraocular single doses, which could lead to wrong concentrations in the preparations as well as risk of contamination), and there was no certainty about its harmlessness and lack of toxicity. Progressively, articles began to be published about its safety and efficiency to the point of becoming one of the most recommendable prophylactic guidelines for cataract surgery in 2006 (5).

Cefuroxime is an antibiotic which, in the multicenter study being commented, has proven to be efficient, safe and endowed with a reasonable antibacterial spectrum. In addition, it has been verified that the intra-chamber administration of an antibiotic in a bolus sets it apart from other administration routes. Accordingly, this study should be a reference for other antimicrobial trials for improving the bacterial spectrum and safety with the final purpose of achieving «zero risk» for endophthalmitis.

REFERENCES