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LETTER TO THE EDITOR

Response to the letter to the editor by Dr. Yasar and Babaoglu on the recent publication of Kokki et al. on the pharmacokinetics of metoprolol bioavailability in coronary artery bypass surgery patients

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Dear Editor, professor Rune Dahlqvist

We are writing in response to the letter from Dr. Yasar and Babaoglu commenting on the recent publication by Kokki et al. [1] on the pharmacokinetics of metoprolol bioavailability in coronary artery bypass surgery patients. Atrial fibrillation (AF) is the most common arrhythmia to occur after cardiac surgery. The reported incidence varies between 5.5 and 57% and is even higher after combined coronary artery bypass grafting (CABG) and valve surgery than after CABG alone. Postoperative AF is associated with serious complications, including increased risk of stroke and need of additional treatment, as well as prolonged hospital stay and increased costs. Beta blockers are commonly used in patients with cardiac surgery procedures. Despite this widely used therapy administrated by mouth, the incidence of postoperative AF is high. It is unknown why the beta blockers do not reduce the incidence of postoperative AF more efficiently.

Valtola and colleagues [2] have evaluated in their study the bioavailability of perioperative metoprolol tablets in CABG patients. In that study, the bioavailability of beta blockers by mouth was significantly less postoperatively than on the preoperative day. They concluded that there may be several reasons for this poor absorption and low bioavailability. First, several patients should have had bowel dysfunction and delayed gastric emptying immediately following cardiac surgery, second, during and after major cardiovascular surgery using cardiopulmonary bypass, structural changes to the intestine may occur and result on villous atrophy and third, changes in splanchnic blood flow, oedema and mucosal ischemia, all commonly associated with cardiac surgery procedures, impair absorption by decreasing the effective absorptive area of the gut and reducing mucosal transport.

Supporting these assumptions, Halonen and colleagues [3] showed in their prospective, randomized study, that intravenous metoprolol was more effective than tablets by mouth in the prevention of AF after cardiac surgery. The incidence of postoperative AF was significantly lower (16.8%) in the intravenous group than in the group where metoprolol was administered by mouth group (28.1%).

In conclusion, the reduced bioavailability and poor effect of metoprolol administered by mouth is not associated with decreased metabolism the parent drug in liver. Theoretically, the reduced peak concentration and exposure to metoprolol on the first postoperative day can be explained by an increase in hepatic clearance and first-pass metabolism. However, we believe that this in unlikely because the splanchnic perfusion is decreased immediately after major surgery.

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