Estimated AUC of Mycophenolate mofetil in pediatric patients with hematopoietic cell translaptation using a reduced sampling model validated for kidney transplant

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Mycophenolate mofetil (MMF) is the 2-morpholinoethyl ester of mycophenolic acid (MPA), a selective inhibitor of inosine monophosphate dehydrogenase (IMPDH). It has indication, even in pediatric patients, to prevent solid organ rejection following liver, heart, kidney transplant, but it's used even in hematopoietic stem cell transplantation (HTC) [1].
Even though many authors demonstrated the importance of monitoring Area Under the Curve (AUC) of MMF (AUC_{0-12}'s therapeutic range between 30 and 60 mcg h/ml), this procedure is not widely accepted and followed in many onco-hematologic centres [2]. Otherwise there's the necessity to reduce at minimum blood samplings in pediatric patients to calculate the drug's AUC.
Majors studies have been carried out to kidney transplant patients, for whom there are validated limited sampling models even in pediatric population [3-4].

This observational retrospective study has been carried out on 20 pediatric onco-hematologic patients with HTC who received MMF and underwent at least 3 AUC measurements of the drug. The period of the study was from April 2012 to April 2015. The estimated AUC_{0-12} was calculated using a Pk sampling model validated for the kidney transplant (estimated $AUC_{0-12} = 18.6 + 4.3 * C_0 + 0.54 * C_{0.5} + 2.15 * C_2$) [5].

At the basal measurement, only 7 patients were in the correct therapeutic AUC's range, while 11 patients were under the range and 2 of them were over the range.
Based on these results, clinicians adjusted the dosage of the MMF and AUC was re-calculated after about 15 days: at that time the range was achieved for 17 patients (statistically significant difference, $P<0.0012$) and only 3 of them were out of range (2 ones under, 1 over).

In conclusion: 1) we confirm the importance of MMF's AUC calculation; 2) even if the used sampling model is for kidney transplant patients, it has been useful to gain the adequate therapeutic range of MMF.
Clearly, there's the necessity to make more extended prospective trials in the future, to create and validate a sampling model based on these specific patients.

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