Prospectives and limitations by a novel algorithm

Karin Holweger, Hans-Peter Lipp

► To cite this version:

Karin Holweger, Hans-Peter Lipp. Prospectives and limitations by a novel algorithm. Cancer Chemotherapy and Pharmacology, 2011, 67 (6), pp.1481-1482. 10.1007/s00280-011-1607-y . hal-00680706

HAL Id: hal-00680706

<https://hal.science/hal-00680706>

Submitted on 20 Mar 2012

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

CCP-10-0780RI - plus the letter below must be also published with this manuscript

Title: Prospectives and Limitations by a novel algorithm.

Reply to the letter " " by

Karin Holweger, PhD student, Pharmacist, Department of Hospital Pharmacy, Roentgenweg 9, 72076 Tuebingen, Germany

Hans-Peter Lipp, PhD, Director of Department of Hospital Pharmacy, Roentgenweg 9, 72076 Tuebingen, Germany

Correspondence: Mrs Karin Holweger, Department of Hospital Pharmacy, Roentgenweg 9, 72076 Tuebingen, Germany, fax 49 7071-29-5050, phone 49 7071-2982278, e-mail karin.holweger@med.uni-tuebingen.de

Dear colleagues,

we have recently proposed a novel algorithm to be more accurate to calculate individual GFR in cancer patients over a broad range of constitutive GFR than conventionally used formulas [1]. In order to proof potential translation of our results in clinical practice, we chose carboplatin as a very useful anticancer drug because the agent undergoes extensive glomerular filtration as unchanged drug. Carboplatin AUC measured by the limited sampling method according to Sorensen et al. was used as a reference to compare calculated and real carboplatin pharmacokinetics by the Calvert formula and GFR values of varying origin in more detail [2].

During the study, our centralized IV admixture service used a carboplatin target AUC of 5 mg/ml x min and GFR based on creatinine clearance (CrCl) via 24-hour urine collection (n=15) and the Jelliffe formula (n=14). Based on additional tubular secretion of creatinine [3], CrCl values are constitutively higher than corresponding GFR values with higher AUC-values as a consequence calculated by the Calvert formula which is in accordance to our observation: 5.8 ± 1.1 mg/ml x min. However, this difference does not appear to be of clinical relevance.

Our algorithm has been based on the MDRD-6 formula in order to include more patient specific parameters, e.g. blood urea and albumin. We retrospectively assessed the validity of the MDRD-4 IDMS (data not shown), however its accuracy appeared to be lower with a mean MPE of -12% (SD $\pm$ 17%) and a precision of 16% (SD $\pm$ 12%). As a consequence, we did not favour the use of the MDRD-4 furthermore. Whether the CKI-EPI formula, which has not been included in our calculations so far, may be of increasing value needs further clinical investigation [4].

Undoubtedly, clinical experience with anticancer drugs in obese cancer patients remains scarce. Whereas the use of the unmodified Cockcroft-Gault formula cannot be recommended in obese patients receiving carboplatin based on the severely increased risk for overdosage, modification of the original formula by inclusion of body surface area (BSA) as a reference or by the use of adjusted ideal (AIBW) rather than current body weight has not yet been clearly evaluated [5]. Our algorithm has not been developed with a special focus on obese cancer patients, however, those who were valuable revealed to be accurately assessed. As a consequence, the novel algorithm can also be used in patients with

increased body mass index (BMI) without further limitations. Possibly, the inclusion of the Salazar-Corcoran formula within the algorithm may be of some advantage in this context, because it has been originally developed for non cancer patients with obesity.

In conclusion, we totally agree that more intensified studies may be warranted to evaluate the usefulness of the MDRD-4 formula in more detail and to focus obese patients with their underlying renal function in more detail in the near future.

References

1. Holweger K, Lipp HP, Dietz K, Hartmann JT, Bokemeyer C (2008) Novel algorithm for more accurate calculation of renal function in adults with cancer. *Ann Pharmacother* 42: 1749-1757
2. Holweger K, Lipp HP, Beijnen JH, Bokemeyer C, Hartmann JT (2010) Evaluation of a non cystatin-C-based novel algorithm to calculate individual glomerular filtration rate in cancer patients receiving carboplatin. *Cancer Chemother Pharmacol*
3. Stevens LA, Coresh J, Greene T, Levey AS (2006) Assessing kidney function--measured and estimated glomerular filtration rate. *N Engl J Med* 354: 2473-2483
4. Levey AS, Stevens LA, Schmid CH, Zhang YL, Castro AF, III, Feldman HI, Kusek JW, Eggers P, Van Lente F, Greene T, Coresh J (2009) A new equation to estimate glomerular filtration rate. *Ann Intern Med* 150: 604-612
5. Ekhardt C, Rodenhuis S, Schellens JH, Beijnen JH, Huitema AD (2009) Carboplatin dosing in overweight and obese patients with normal renal function, does weight matter? *Cancer Chemother Pharmacol* 64: 115-122

Manuscript ID Manuscript Title E-Mail Address First or Last Name ----- Adv. Manuscript Search Adv. User Search