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Correction factors after having neglected the first exponential in the estimation of chromium-51 EDTA clearance: a reappraisal

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The aim of the present work was to evaluate two classical formulae allowing the correction for having neglected the first exponential in the slope-intercept method used for the determination of EDTA clearance, namely the Chantler's linear correction formula (CH) and the Bröchner-Mortensen's quadratic correction formula (BM). First, a comparison study was performed with the two correction formulae, in order to predict the behavior of the calculated clearance, for various levels of renal function. Second, using data obtained from 47 adult patients with normal renal function, the results obtained with the two correction formulae have been compared to the reference technique, namely the biexponential fit. The results of the comparison study indicated that for clearance values lower than 120 ml/min, the results obtained using CH were systematically lower than those of BM, whereas for clearance values between 120 and 140 ml/min, the reverse was observed. The differences however, never exceeded 8 ml/min. The results were quite different when the clearance was higher than 140 ml/min, when the difference between CH and BM results increased rapidly, and the BM provided values systematically lower than CH. The clinical study showed that, in the range of normal clearance values, both CH and BM clearances were slightly lower than the results obtained by means of the reference technique. Based on these results, a new specifically designed validation study involving patients with high clearance values is mandatory to determine which of these two correction methods is more accurate, or to devise a better correction formula.

Key words: Cr-51 EDTA, plasma clearance, two sample method, correction formula