Urinary Enzyme Excretion after Donor Nephrectomy – How Should We Express and Compare Excretion Rates of the Remaining Kidney after Donor Nephrectomy?

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Dear Sir,

As I am interested in the problem of kidney function after donor nephrectomy, I read the paper of Tapson et al. [1] about urinary enzyme excretion in kidney donors with great interest. The authors concluded from their investigations and calculations that the urinary excretion of the two brush-border enzymes alanine aminopeptidase (EC 3.4.11.2) and alkaline phosphatase (EC 3.1.3.1), of the lysosomal enzyme N-acetyl- β -D-glucosaminidase (EC 3.2.1.30) and the cytosolic enzyme lactate dehydrogenase (EC 1.1.1.27) were significantly higher by the remaining kidney in long-term kidney donors than the corresponding excretion by the single kidney in a control group. To make these comparisons between both groups, 'values in the control group, therefore, refer to enzyme excretion per single kidney' [1]. I totally agree with the authors that comparisons of the excretion rates (e.g. of enzymes, proteins) between control persons with two kidneys and kidney donors after nephrectomy have to take that into account. Thus, the authors obviously compared the urinary enzyme excretion in the donors with that in control persons by dividing the values measured in the control group persons by the factor two. To express the enzyme excretion values the authors used the term enzyme units per gram urinary creatinine. In my mind, this ratio is not suited for such comparative calculations between both groups. For example, when a healthy person excretes per day 1 litre of urine containing a certain enzyme activity of 10 U and 1 g of creatinine, the calculated ratio of enzyme activity to urinary creatinine is 10. As it is considered by Tapson et al. [1] from the results of Hulet et al. [2], each kidney contributes 50% of the total kidney function. Consequently, it can be assumed that each kidney excretes 500 ml of urine containing 5 U of enzyme and 0.5 g of creatinine. The ratio of enzyme activity to urinary creatinine remains identical, in the same way, 10. A halving of this ratio as considered by

Tapson et al. [1] would only result, if the actually excreted enzyme per one kidney (5 U) was divided by the amount of creatinine excreted by the two kidneys (1 g of creatinine). However, in the example of kidney donors, a daily excretion of 1 litre of urine containing 10 U of enzyme and 1 g of creatinine also gives the ratio 10, although the remaining kidney solely excretes this enzyme amount. Thus, as our examples show I have the impression that the calculation using the ratio of enzyme activity to urinary creatinine for such comparisons is misleading in this context. I recommend comparisons by using time-related excretions (e.g. urine sampling over 4 h for urinary enzymes or over 24 h for urine proteins) which additionally avoid to relate the changes of

enzyme output to variations of creatinine outputs in the investigated groups. It should be stressed once again that there is no point in making these comparisons between control persons and kidney donors without relating the excretion rates to one kidney. Unfortunately, numerous papers, likewise the two references cited by Tapson et al. [1], failed to consider this precondition for an exact comparison and thus came to doubtful conclusions.

References

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