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Letter to the editor

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Albuminuria during acute myocardial infarction and prognosis: a methodological issue

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To the Editor. In the recently published study by Lazzeri *et al.* [1], microalbuminuria and other clinical variables were evaluated in hypertensive, nondiabetic patients with ST elevation myocardial infarction [1]. The authors concluded that microalbuminuria does not yield prognostic information about the inhospital mortality or complications and claimed an association between acute glucose dysmetabolism and outcomes. We believe that, in this study, the predictive power of microalbuminuria has been overlooked by the authors due to a series of methodological problems.

Even though microalbuminuria was the main variable of the study, it was not detailed in the methods. The authors report that samples were taken for microalbuminuria 'during the night', but not which night after acute myocardial infarction (AMI), as it is well known that microalbuminuria levels vary according to time for at least 7 days after AMI [2,3]. How was microalbuminuria measured, and was a qualitative or quantitative method used? Furthermore, details on the kit used should be reported to allow other researchers to reproduce such measurements. If a quantitative method was used, what were the microalbuminuria mean/median values found in the sample and subgroups? In the method section, the authors state the use of 'forward stepwise logistic regression', whereas in the results they use a backward logistic analysis. Which method was really used? Yet, even though microalbuminuria was tested to ascertain whether it is associated to outcome, the authors state that they used microalbuminuria as 'dependent variable' in the logistic analysis. This is at least confounding.

From these methodological observations several questions arise. In the article by Lazzeri *et al.*, age was not different in the patients with or without microalbumi-

nuria; indeed, this is unusual as other research groups found age to differ significantly according to microalbuminuria levels [3–5]. Yet, physical examination and echocardiographic signs of heart failure were not prevalent in the patients with microalbuminuria. This again contrasts with the other reports, all of which found higher microalbuminuria levels in the patients with heart failure [3–5]. Even among hypertensive patients with AMI these differences held true [6]. Furthermore, the fact that the patients of this study underwent primary percutaneous coronary angioplasty could hardly explain these differences, as previous studies in which microalbuminuria measurement method was well detailed, and including patients treated with primary percutaneous coronary angioplasty, gave completely different results [4,5] as compared with the results of Lazzeri *et al.* Even clinically more relevant, inhospital mortality was 1.7% among low microalbuminuria patients and 9% among high microalbuminuria patients. This indicated a four-times higher mortality rate in the latter group, which is clinically an enormous difference regardless of the *P*-value reported, which is affected by the low figures of the study. Our results published in *Circulation* in 1997 [3] showed a similar trend for inhospital mortality, with a high level of statistical significance. Besides, Figure 1 seems unclear due to absence of a measurement scale, and even 'no complication' bars, of the same figure, have no apparent meaning. Finally, the use of microalbuminuria as a dependent variable in the logistic regression models does not allow testing its association with outcome, hence questioning the validity of the analysis results. We believe the differences in results between the work by Lazzeri *et al.* and other reports are not based on physiopathologic mechanisms, as the authors claim, but are due to the major methodological and analysis flaws pointed out above, which, we do believe, need to be carefully addressed [3–6].

Last, but not least, we would be very pleased if this letter could stimulate discussion on the importance of methodological problems that could lead to unreliable and potentially misleading results.

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