Myocardial blood flow quantification by Rb-82 cardiac PET/CT: Methodological issues on reproducibility study

I was interested to read the paper by Dunet V and colleagues published in the Jun 2016 issue of *J Nucl Cardiol*.¹ They aimed to assess reproducibility of two software packages (PMOD and FlowQuant (Lortie model)) for quantifying myocardial blood flow (MBF) and myocardial flow reserve (MFR) using dynamic Rb-82 PET at rest and during adenosine stress.¹

They used Pearson's correlation ρ for measuring precision and reported an excellent precision ρ for MBF ($\rho = 0.97$) and good precision for MFR ($\rho = 0.83$). However, PMOD provided slightly higher values than FlowQuant at higher MBF and MFR values ($P < .0001$).¹

Reproducibility (precision, repeatability, reliability, or interchangeability) is being assessed by different statistical tests including Pearson's correlation ρ which is one of the common mistakes in Reproducibility analysis.²⁻⁶ Pearson's correlation ρ only assesses the linearity between two continuous variables. Any shift in the location and/or scale of the regression line which leads to nonreproducibility cannot be detected by this correlation coefficient.² Therefore, for quantitative variables, Intra Class Correlation Coefficient single measure is the best statistical test to evaluate reproducibility.²⁻⁶ It is good to know that in reliability analysis individual approach should be considered instead of global average which Pearson's correlation ρ cannot do that. Moreover, statistically significant should not be considered in reproducibility analysis.³⁻⁶ As a take home message, for reliability analysis, appropriate tests should be applied, otherwise, misdiagnosis and mismanagement of the patients cannot be avoided.

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