In clinical measurement comparison of a new measurement technique with an established one is often needed to see whether they agree sufficiently for the new to replace the old. Such investigations are often analysed inappropriately, notably by using correlation coefficients. The use of correlation is misleading.

Bland and Altman developed their analysis to address the inappropriate use of the correlation coefficient as a means of comparing 2 methods of measuring the same clinical parameter. However, a careful reading of their manuscript shows that the short-coming they sought to address was of mistaking a high degree of correlation for agreement (or concordance) between 2 measurement techniques.

In that paper they state the following.

1. "r (the correlation coefficient) measures the strength of a relation between two variables, not agreement between them.

We have perfect agreement if the points lie along the line of equality (ie, a regression line with a slope of 1), but we have perfect correlation if the points lie along any straight line."

2. "Data which seem to be in poor agreement can produce quite high correlations."

At no point in their paper do Bland and Altman argue that data exhibiting a low degree of correlation can be in agreement and this makes sense, for if the data points do not fall on any line, how can they fall on the "line of equality"?

Furthermore, in describing their technique for "measuring agreement", Bland and Altman state: "How far apart measurements can be without causing difficulties will be a question of judgement. Ideally it should be defined in advance to help in the interpretation of the method comparison and to choose the sample size." [1].

[1]

Bland JM, Altman DG. Statistical methods for assessing agreement between two methods of clinical measurement. Lancet. 1986 Feb 8;1(8476):307-10. PubMed PMID: 2868172.

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