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ABSTRACT SUBMISSION

Title: Multivariate analysis of paired data: a review of methods for paired organ systems

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Abstract

Tests for paired data have been used extensively for assessing the treatment effect in studies involving paired organ systems (e.g. kidneys, eyes). However, there is considerable uncertainty when it comes to choose an appropriate multivariate regression model that would take into account the "within-subject" clustering nature of these data.

Robust sandwich estimate of the covariance matrix[1], generalized linear model[2] and use of mixed models and random effects[3] are some of the methods that have been proposed and used to deal with the correlation/clustering of these data. Still, a number of studies involving paired organ systems data either do not report or do not use methods to account for this effect.

This review will identify and examine the different analysis approaches that have been previously used in studies involving paired organ systems and will discuss the potential benefits and limitations of the most common approaches. Relevant analysis techniques will be identified by searching the MEDLINE and EMBASE databases to find published papers in the English language which report the statistical methods used to analyse paired organ systems data in a multivariate framework. A search will also be undertaken on the Transplant Library Database.

The findings from this review will help other researchers to select the most appropriate model when analysing paired organ systems data.

1. Khalil, A.K., et al., Re-transplants compared to Primary Kidney Transplants Recipients: A Mate Kidney Paired analysis of the OPTN/UNOS database. Clin Transplant, 2016.
2. Robert, R., et al., A pair analysis of the delayed graft function in kidney recipient: the critical role of the donor. J Crit Care, 2010. 25(4): p. 582-90.
3. Cook, R.J., et al., A conditional Markov model for clustered progressive multistate processes under incomplete observation. Biometrics, 2004. 60(2): p. 436-43.

Approval Confirm

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