

Evaluating the best treatment procedure for deep caries lesions in posterior permanent teeth

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In medical and social sciences, analysis of observer or inter rater agreement data often provides a useful means of assessing the reliability of a rating system. A rater can be a measurement method, an instrument, a medical device, a clinical observer, an assay or a technique or a technology. The response being measured may be a categorical variable such as success or failure of a medical treatment or it may be a continuous variable like blood pressure or heart rate. If raters agree well enough to be used interchangeably, then we may prefer the one that is cheaper, less invasive or easier to use. If raters do not agree sufficiently, then we select the best method using statistical techniques. The objective of this study was to evaluate the best treatment procedure for deep carious lesions in the posterior teeth. In practice, it is difficult to select the best treatment procedure by fitting models for all the treatments, as it is a time consuming task. Therefore, in this study, at the first stage we tested the agreement between treatment procedures using Kappa statistic and then selected the best procedure. If there is a good agreement between treatment methods, they can be used interchangeably. Otherwise we select the best treatment method using odds ratio and relative risk. Since there is no good agreement between treatment procedures, Chi squared test was used to check the significant difference between treatment procedures. At the second stage we modeled the data set corresponding to the best treatment method using Lasso Regression. Indirect pulp capping method with Calcium Hydroxide, injectable Glass Ionomer Cement (GIC) and light cured posterior composite (LCC) treatment was selected as the best treatment method for deep carious lesions in the posterior teeth. Moreover, a model for success or failure of this treatment method was fitted using Lasso Regression with three predictor variables, exposure time, exposure size and pulp conditions.