USE of INFORMATION THEORY WHEN DISEASE STATE HAS THREE CATEGORIES

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Information theory is a technique which has been used for the evaluation of imperfect diagnostic tests. Mutual information (MI) and relative entropy (RE) are two basic concepts in information theory. While MI measures the expected diagnostic information provided by a diagnostic test, RE measures the rule in and rule out potentials of a diagnostic test. The aim of this study is, first to show how the formula of MI, which is used in two class diagnostic problems, can be adopted to tests with ordinal outcomes and to "three and more-class" diagnostic problems; second, when there are two or more diagnostic alternatives, by RE approach to, evaluate the rule in and rule out performances of parameters for each diagnostic alternative. The above mentioned methods are used for evaluating the diagnostic performance of strain and strain rate parameters of "Color Tissue Doppler" (CTD) in diagnosing acute myocardial infarction (AMI). There are three arters which one of them is responsible for AMI. Some CTD parameters can detect two, some can detect three arters (three class diagnostic problem) one of which causes AMI, with some uncertainty. First we demonstrated the amount of reduction in diagnostic uncertainty when these parameters were used and second for each disease state the ruling in and ruling out performances of these parameters were identified.