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iFR diagnostic accuracy using FFR as gold standard: insights from a 5-year experience

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Background: Functional coronary lesion assessment by fractional flow reserve (FFR) is commonly employed worldwide. Recently, several studies have focused on a new parameter, the instantaneous wave free ratio (iFR), as an alternative or complementary method to FFR which does not require the use of adenosine. The use of iFR, however, is not consensual: its ideal cut-off and interpretation are still not completely established.
**Purpose:** We aimed to analyse the diagnostic accuracy of iFR using FFR as gold standard.
Methods: Retrospective analysis of all patients undergoing functional coronary lesion assessment during 5 years. FFR was used as a gold standard for assessing the diagnostic accuracy of iFR in every patient who underwent measurements with both techniques. The decision was made on an individual patient basis according to the operator's decision. For statistical analysis we used Receiver Operating Characteristics (ROC) curve. The test was undertaken for 2 FFR cut-offs: $\leq 0,80$ and $< 0,75$.
Results: Functional testing was undertaken in 326 patients (67±11 years, 65,6% male), encompassing 402 lesions. 154 lesions underwent assessment with both techniques, 222 by FFR only and 26 cases iFR only.
Using an FFR cut-off of $\leq 0,80$, the area under the curve (AUC) was 0,73 (95% CI 0,65–0,81). The optimal iFR cut-off point was $\leq 0,91$, with a sensitivity of 55%, specificity of 79%, positive predictive value (PPV) of 52% and negative predictive value (NPV) of 81%. The iFR interval with a sensitivity and specificity >90% was 0,88–0,94.
Using an FFR cut-off of $< 0,75$, the AUC was 0,72 (95% CI 0,60–0,84). The optimal iFR cut-off point was also $\leq 0,91$, with a sensitivity of 47%, specificity of 89%, PPV of 19% and NPV of 97%. The iFR interval with a sensitivity and specificity >90% was 0,87–0,95.
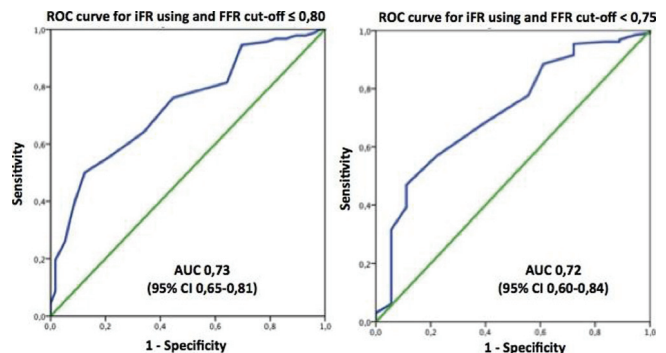
ROC_curve

Conclusions: By using FFR as a gold standard, iFR had a reasonable diagnostic accuracy, slightly inferior to other published results. The ideal cut-off points were slightly higher than those commonly employed. The use of a FFR cut-off point of $< 0,75$ mildly diminished the accuracy of iFR, but increased its specificity at the expense of sensitivity.