

Clinical Efficacy of Nicorandil to Perform Pharmacological Stressed Perfusion MRI for the Assessment of Ischemic Heart Diseases.: 234 cases experiences.

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Purpose

The objective is to assess the clinical efficacy of Nicorandil (a hybrid ATP sensitive potassium channel opener/nitric oxide donor) for the safe performance of stressed perfusion MRI using pharmaceuticals.

Methods

The subjects were 234 patients with ischemic heart diseases who underwent Nicorandil (8mg i.v.) stressed and non-stressed Perfusion MRI. 88 patients underwent selective CAG within 10 days of MRI study. The MRI system used was a 1.5T MR imager (EXCELART; Toshiba Corporation, Tokyo) with a 4ch body array coil(linear).and Torso Array Coil with 8 QD surface coils for parallel imaging. FFE-EPI sequence for perfusion during and without pharmacological stress was below; TR=7.1-8.3ms TE=2.1ms TI=10ms FA=30 NAQ=1 FOV=25-28x36cm MX=64-96x128 ST=8mm NS=4-8 Number of Shots=20-24 Dynamic=25-30 times Time=about 1min. And Inversion Recovery sequence for late enhancement was acquired. The results were compared with the findings obtained by CAG.

Results

(1) In none of the 234 cases did complications such as an episode due to angina pectoris or arrhythmia arise. Stressed perfusion MRI was safely performed.
(2) In 88 cases who underwent CAG, the results of assessment of ischemic region obtained by stressed perfusion MRI were in accord with those of significant stenosis (>70% stenosis) obtained by CAG performed subsequently; 1)RCA: Sensitivity 88%, Specificity 71% □2)LAD: Sensitivity 94%, Specificity 58% □3)LCX: Sensitivity 83%, Specificity 71% □4)OVER ALL: Sensitivity 89%, Specificity 68%. In the comparison between stressed and non-stressed perfusion studies of early defects, the ischemic region could be appropriately delineated in the stressed studies (FIG.). The usefulness of Nicorandil in stressed perfusion MRI was confirmed.

Discussion

Recently, pharmacological stressed perfusion MRI has been highlighted for the assessment of transmural perfusion in ischemic heart diseases. However, pharmacological stress studies using Dobutamin and Dipyridamole are accompanied by serious risks, which may cause an episode due to angina pectoris or serious arrhythmia. In our institution, Nicorandil has been used for perfusion MRI to avoid serious complications. And we have reported that Nicorandil can be used for the assessment of coronary flow reserve as well as treatment of angina pectoris and Nicorandil stressed-Contrast Echocardiography was safe and useful technique to assess myocardial perfusion in 74th AHA meeting, 2001 □1□. In 11th ISMRM meeting 2003, we have presented preliminary report as concerned with the efficacy of Nicorandil stressed perfusion MRI □2□. It was shown as a result of our study that Nicorandil is very useful for the safe performance of stressed perfusion MRI using pharmaceuticals, which is a clinically valuable method.

Conclusion

We consider that the extent of an ischemic region can be assessed by stressed perfusion MRI using Nicorandil. Clinically useful stressed perfusion MRI could be safely carried out by employing Nicorandil.

References

- 1□ Yasu T, et al.: Circulation(Supplement II), II-750, 104(17), 2001
- 2□ Kobayashi Y, et al.: ISMRM(Supplement), (1670), 2003

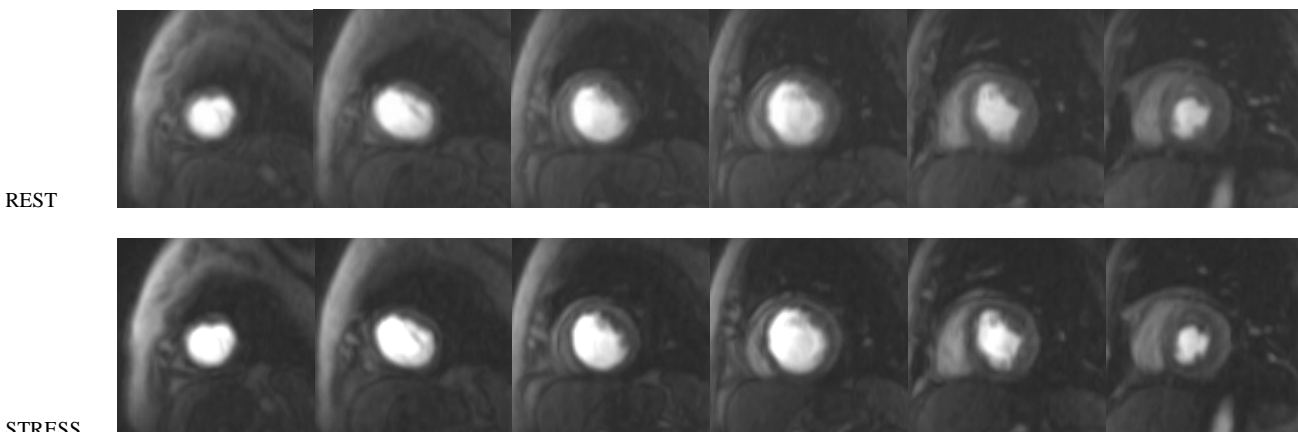


FIG. Ischemic region was appropriately identified in Nicorandil stressed perfusion MRI.