Pharmacological stress test for myocardial ischemia when Adenosine is contraindicated: prospective documentation of side effects in over 700 patients with COPD or bronchial asthma

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Background: In the face of an increasingly elder population, physical exercise tests become less feasible with an increasing need for pharmacological stress tests, preferably with imaging techniques. For myocardial stress tests provoking myocardial ischemia, vasodilator stress is most frequently used. Whereas Dipyridamole should be obsolete, the predominant drug applied within this context is Adenosine for myocardial scintigraphy, magnetic resonance imaging and FFR. Adenosine, however, is contraindicated in patients with COPD or bronchial asthma, predominantly due to a possible exacerbation of bronchospasm or other pulmonary side effects. In contrast, Regadenoson, was especially developed as a highly selective A2A receptor agonist to circumvent these problems.
Methods: Regadenoson was applied with the standard injection dose of 400 μg in 780 consecutive patients with a history of COPD or bronchial asthma for SPECT myocardial perfusion scintigraphy. 12% of the patients had a preexisting first degree AV-block. Blood pressure, heart rate and possible side effects were prospectively monitored and documented for 10 minutes after the injection.
Results: The mean age was 70.8±8.9 years, 52% of the patients were female, 48% were male. 69% had a history of COPD and 31% of bronchial asthma. The maximum increase in heart rate was significant from 66.1±8.1 to 98.3±17.4 bpm. The maximum decrease in systolic blood pressure was significant from 124.3±12.9 to 117.3±24.7 mmHg. Most frequent side effects were a feeling if increased breathing (73%), headache (22%), feeling of warmth (22%), pressure in the stomach (17%) and pressure in the chest (16%). Complications: only 1 patient (without preexisting first degree AV-block) developed a systolic drop in blood pressure from 107 to 60 mmHg with transient severe dyspnoea. No induction of bronchospasm or other pulmonary side effects were observed.
Conclusion: In patients with COPD or bronchial asthma undergoing a pharmacological stress test, Adenosine is contraindicated due to its – potentially severe – pulmonary side effects, Regadenoson is the vasodilator of choice in these patients. In our series, no severe complication was observed – even not in patients with a preexisting first degree AV-block.