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The safety and tolerability of adenosine as a pharmacological stress agent in stress cardiac magnetic resonance imaging

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Introduction

Stress cardiovascular magnetic resonance imaging for evaluation of myocardial ischemia is gaining popularity in recent years. Adenosine, being the most commonly used pharmacological agent to induce myocardial stress, has been found to be safe and effective in many studies. We aimed to assess the safety and effectiveness of the adenosine in Chinese population.

Objectives

To assess the common adverse effects and hemodynamic effects in patients receiving intravenous adenosine for stress CMR.

Methodology

We reviewed 98 consecutive patients who received intravenous adenosine infusion for CMR stress perfusion imaging from May 2013 to Aug 2013. The dose of adenosine was 140μg/kg/min. Their systolic and diastolic blood pressure and pulse were recorded before and after adenosine administration. Common adverse effects were also documented. Paired t test was used to compare interpersonal difference on blood pressure and pulse pre and post drug administration.

Result

There was a total of 98 patients aged 10 to 83 (64±11.4years). The male to female ratio was 2.5:1. The mean body weight was 67.5±12kg. The mean duration of adenosine administration was 3.2±0.94 minutes. Sixty out of 98 (61.2%) patients experienced one or more adenosine associated adverse effects. The rest of them (38.8%) did not experience any discomfort. Chest discomfort was the most frequent adverse effect experienced by 47 patients (47.5%), followed by dyspnea (29.6%) and headache (20.2%). A total of 8 patients (8.1%) also experienced other adverse effects, as shown in table 1. All the above conditions required no treatment. There was no life threatening adverse events. Regarding the hemodynamic effect, significant drop in diastolic blood pressure was observed after adenosine administration (75.1±13.3 vs 68.0±13.9 mmHg, $p<0.01$). Significant rise in pulse rate was noted (75.1±14.3 vs

93.2±14.7 beats/min, p<0.01). There was a general decrease in systolic blood pressure, however, no statistical significant difference was observed (144.9±17.6 vs 143.1±21.4, p=0.18). Conclusion: Adenosine was a safe and effective agent to use in stress CMR. Majority of the patients experienced adverse effects, which are transient and self-limited. No life threatening events was reported.