

## Noninvasive identification of anthracycline cardiotoxicity: Comparison of $^{123}\text{I}$ -MIBG and $^{123}\text{I}$ -BMIPP imaging

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To test the feasibility of myocardial  $^{123}\text{I}$ -MIBG and  $^{123}\text{I}$ -BMIPP imaging for the early detection of anthracycline cardiotoxicity, 13 patients who had received anthracycline anticancer chemotherapeutic agents were studied. Two-dimensional echocardiography and myocardial imaging with both  $^{123}\text{I}$ -MIBG and  $^{123}\text{I}$ -BMIPP were performed in 13 patients treated with anthracycline (group A) and 10 normal control subjects (group C). Anterior myocardial images were obtained 15 minutes and 3 hours after the injection of isotopes. The heart-to-mediastinum ratio (H/M ratio) was used to quantify cardiac  $^{123}\text{I}$ -MIBG and  $^{123}\text{I}$ -BMIPP uptake. The left ventricular shortening fraction (%SF) and the ratio of peak mitral flow velocity in early diastole to that at the time of atrial systole (E/A ratio) were measured by echocardiography. The H/M ratio of  $^{123}\text{I}$ -MIBG was lower in group A than in group C ( $1.5 \pm 0.2$  vs.  $1.9 \pm 0.2$ ,  $p < 0.01$ ). The patients in group A had faster clearance of  $^{123}\text{I}$ -MIBG from the myocardium than those in group C ( $27 \pm 10\%$  vs.  $22 \pm 4\%$ ,  $p < 0.05$ ). However, the H/M ratio and clearance of  $^{123}\text{I}$ -BMIPP were similar between the two groups (H/M ratio:  $2.1 \pm 0.2$  vs.  $2.0 \pm 0.2$ , clearance:  $24 \pm 6\%$  vs.  $26 \pm 6\%$ ). The %SF ( $37 \pm 8\%$  vs.  $36 \pm 7\%$ ) and E/A ratio ( $1.4 \pm 0.4$  vs.  $1.6 \pm 0.3$ ) were comparable in groups A and C.

The present findings indicated that myocardial imaging with  $^{123}\text{I}$ -MIBG could detect myocardial damage in patients treated with anthracycline in the early stage when cardiac systolic and diastolic function was still preserved. Early detection of anthracycline cardiotoxicity by  $^{123}\text{I}$ -MIBG would reduce the incidence and severity of heart failure.

**Key words:**  $^{123}\text{I}$ -MIBG,  $^{123}\text{I}$ -BMIPP, doxorubicin cardiotoxicity