Safety of MR Imaging of the Liver With Ferucarbotran: Multicenter Investigation using Questionnaire Before and After an Examination

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Purpose

To prospectively investigate the adverse reactions to ferucarbotran (Resovist), a superparamagnetic iron oxide contrast agent, using a questionnaire before and after the injection in order to estimate the false positive adverse reactions.

Materials and Methods

The study was each institutional ethics committee approved; all patients gave written informed consent. Three hundred fifteen patients who underwent ferucarbotran-enhanced magnetic resonance (MR) imaging of the liver in the several institutions were given a questionnaire asking about the occurrence of subjective symptoms and duration over a period of 7 days before and after injection of ferucarbotran. The adverse events during and immediately after the injection of ferucarbotran were observed by the investigator and asked by general questioning. The incidence of the symptoms after the injection of ferucarbotran was statistically compared with the incidence of the baseline symptoms before the injection using McNemar's chi-square test for each subset of symptoms. Associations between the incidence of adverse reactions, adverse events (postcontrast symptom) or baseline symptom and each factor of the patient backgrounds (gender, history of allergy, previous exposure to contrast media and history of adverse reactions to contrast media) were compared using Fisher's exact test.

Results

Over a period of 7 days before the MR examination, 249 clinical symptoms were complained in 102 of 315 patients (32.4%). Over a period of 7 days after the administration of ferucarbotran, 169 adverse events (postcontrast symptom) were observed in 78 of 315 patients (24.8 %). By the investigators, 70 of 169 events (45 patients, 14.3%) were classified as adverse reactions to ferucarbotran that was considered as the possibly or definitely drug related adverse events, all of which were of mild intensity. The postcontrast incidence of nausea, dizziness, distension, diarrhea, heartburn, anorexia, taste alteration, chest pain and epistaxis was higher than the baseline incidence, but there were no statistically significant differences. Associations between each incidence and each factor of the patient backgrounds were shown in Table.

Discussion

The adverse reactions to ferucarbotran occurred in 45 of 315 patients (14.3%), all of which were of mild intensity. However, the adverse reactions might potentially include the true not drug related (false positive) events to no small extent, because there were no statistically significant differences between the postcontrast incidence and the baseline incidence in each subset of symptoms.

In conclusion, ferucarbotran was considered to be safe in the clinical use at MR imaging of the liver.

Table. Relationship between each incidence and patients backgrounds.

Patients Backgrounds		Adverse reactions	Adverse events (Postcontrast symptom)	Baseline symptoms
Gender	Male (n = 207)	19 (9.2)	40 (19.3)	55 (26.6)
		$P < .001$	$P < .005$	$P < .005$
	Female (n = 108)	26 (24.1)	38 (35.2)	47 (43.5)
History of allergy	Absent (n = 228)	23 (10.1)	46 (20.2)	59 (25.9)
		$P < .005$	$P < .005$	$P < .001$
	Present (n = 83)	20 (24.1)	30 (36.1)	40 (48.2)
Previous exposure to CM	Absent (n = 28)	4 (14.3)	6 (21.4)	7 (25.0)
		NS	NS	NS
	Present (n = 284)	41 (14.5)	72 (25.4)	94 (33.1)
History of adverse reactions to CM	Absent (n = 249)	30 (12.1)	57 (22.9)	74 (19.7)
		$P < .01$	$P < .05$	$P < .005$
	Present (n = 35)	11 (31.4)	15 (42.9)	20 (57.1)

Note: Numbers in parentheses are percentages. CM = contrast media. NS = No significance.