

Allergic Reactions to Gadolinium Chelates

In the well-written article entitled "Do Not Resuscitate" [1] in the December 2000 issue of *AJR*, Berlin makes reference to a severe contrast media reaction. Although clearly not the intent of the author, the reader might be left with the erroneous impression that such a reaction is unique to, or more common with, the agent mentioned, gadoteridol (ProHance; Bracco Diagnostics, Princeton, NJ). Indeed, this article is now being inappropriately used to support such a hypothesis. In recent years, the pharmaceutical industry has become increasingly competitive, and unsubstantiated negative comments by local sales representatives are common. This environment does nothing to improve the quality of medical care, and, indeed, promotes the opposite.

To the best of current scientific knowledge, all of the gadolinium chelates approved clinically for use in the United States—gadopentetate dimeglumine (Magnevist; Berlex Laboratories, Wayne, NJ), gadoteridol (Bristol-Myers Squibb, Princeton, NJ), gadodiamide (Omniscan; Nycomed, Princeton, NJ), and gadoversetamide (OptiMARK; Mallinckrodt, St. Louis, MO)—have the same incidence of severe anaphylactoid reactions [2]. This is also true for minor adverse reactions, the two most notable being nausea and hives. In the published literature, only one article [3] even suggests the possibility of a difference among agents. However, that article is flawed, in that it is a retrospective survey (subject to recall and reporting bias) without verification of responses with source data. The article stands in sharp contrast to the published, well-controlled national trials with each agent, in which no difference in adverse reactions has ever been demonstrated [4–7]. Although the agents can be differentiated on the basis of certain physical properties such as osmolality and viscosity, they cannot be differentiated on the basis of adverse reactions (including, specifically, anaphylaxis, nausea, and hives).

As one of the early researchers in the field of MR imaging contrast media and an acknowledged expert, I have received financial support at one time or another from all of the companies in the pharmaceutical industry. My current research contract through the university is with Bracco Diagnostics, and the journal that I am editor of, *Investigative Radiology*, receives financial support from Berlex Laboratories (Schering), Bracco Diagnostics, and Nycomed. Regardless, my opinions rest on a scientific basis and concur with those of the other experts in the field.

Radiologists should be aware that severe anaphylactoid reactions, although rare, can occur after IV injection of any of the clinically approved gadolinium chelates. The first such reaction, reported in 1990 [8], occurred after an injection of gadopentetate dimeglumine, only 2 years after its clinical approval in the United States. By 1995, a fatal reaction had been published in the scientific literature [9]. Most of the severe allergic reactions described in the literature occurred after gadopentetate dimeglumine injection, likely because this agent was the first approved. However, severe reactions to all of the gadolinium chelates approved in the United States have been reported and the agents cannot be differentiated on this basis. Anaphylactoid reactions have also been described [10] with gadolinium chelates such as gadoterate meglumine (Dotarem; Guerbet, Roissy, France) that are not available in the United States and thus have likely been used in far fewer patients. These reactions presumably occur with similar incidence.

Let us not add to the problem of contrast media reactions by permitting unsubstantiated rumors to circulate regarding "higher rates of reactions" with one or another agent, but rather continue to promote science and its many benefits so obvious to us today.

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Reply

I thank Dr. Runge for his letter. The specific name of the gadolinium agent administered was included in the "Do Not Resuscitate" article [1] solely for the sake of scientific completeness. I in no way intended to suggest that this agent is associated with higher frequency or severity of reactions than other similar agents used in MR imag-