

CONTRAST REACTIONS & PREMEDICATION (AN OVERVIEW)

Reactions to contrast media: One of the problems our patients and we have regarding contrast reactions is that these reactions are idiosyncratic and unpredictable. A person may react to a contrast agent one time and then not react to the same contrast the next time, or vice versa.

Unfortunately, to date, IV pre-testing to contrast agents has been neither predictive nor reliable and is considered potentially dangerous since contrast reactions are not dose-dependent. A severe reaction (CODE) can occur with a 5 ml "test dose."

It is the opinion of contrast experts that neither the iodine nor the gadolinium element causes a reaction; rather, it is the contrast molecule (attached to which is either the iodine or the gadolinium). The reaction, at least in part, is caused by a non-specific activation of IgE on the mast cells. Since activation is non-specific and not directly related to the I or Gd, there is cross-over in reactivity.

Serious reactions to contrast agents are very uncommon. For example, in the recently reported Mayo Clinic experience (*AJR* 2009; 192:455-61), reactions overall to contrast were uncommon (1:1000) and very serious ones requiring transportation to the ED were very uncommon (4:100,000 injections), but they occurred with both iodinated and gadolinium contrast. Reactions to gadolinium agents were about 1/2 as frequent as with iodinated agents. Life-threatening reactions occur unpredictably and to both types of agents.

Premedication: Is it absolutely protective? No. However, most experts believe that premedication regimens with corticosteroids reduce the risk of a repeat reaction and may modify serious reactions.

Which type of premedication ? Corticosteroids are essential for the premedication regimen. Two corticosteroid regimens are available in our departmental protocol; both are considered to be equally effective. Anti-histamines alone, such as Benadryl(R), are not adequate for premedication.

Whom should you premedicate? Identifying the "at risk" patient is a difficult and imprecise task. We do know that patients who have had a prior reaction to one contrast agent are at more risk for having another reaction to a subsequent contrast agent, either iodine or gadolinium. Will it always occur with a repeat injection--no; might it occur--yes. Patients who have multiple allergies are at higher risk for having a contrast reaction. These patients seem to be "reactive patients" who react to many stimuli, including contrast (the non-specific stimulus). Patients with active asthma are at greater risk, in large part because they may be extremely difficult to treat if a severe reaction occurs. One "marker" for identifying a higher risk patient for whom premedication is recommended is whether the patient was treated for the prior reaction---was "treatment" given; that is, did the physician evaluating that reaction feel it necessitated treatment.

But, the science of whom to premedicate is inexact. There is consensus that a prior reaction of only a few scattered hives likely doesn't require premedication. But, that statement is less valid for the patient who also has a multiple-allergy history. And, if there was any associated facial/airway edema, premedication is recommended. Another way to approach the problem:

if it were your significant other, spouse, partner, child, or relative who had a higher "risk profile"---would you want them to have premedication, even it were inconvenient?

Why is there so much confusion about premedication? Many reasons including: a.) information and recommendations from various organizations changes as more information becomes available; b.) trainees and faculty bring different teaching from their prior institutions (some of which is outdated or clearly incorrect); c.) information is inaccurate (e.g. history of an "allergy" to iodine or shellfish---an allergy, yes, but there is no direct correlation to subsequent reactions to iodinated contrast; no more so than an allergy to chocolate. It isn't the I or Gd; it is the molecule carrying the element.)

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