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Anaphylaxis with iodinated contrast media

In excess of 70 million injections of iodinated contrast media are administered per year around the world. This approach is a diagnostic aid that has revolutionised clinical practice since its introduction in the 1950's. Although generally considered relative safe, there is a possibility of adverse effects in the form of allergy like reactions in exposed patients.

Immediate reactions range from nausea, itching, urticaria, angioedema to more serious effects such as bronchoconstriction, laryngeal oedema, hypotension and death. Delayed reactions (three hours to a week after administration) mainly include mild to moderate skin reactions. Reactions can occur after intravascular (e.g. cardiac procedures) and intracavitary administration (e.g. urology procedures).

The exact pathogenesis of the reactions differs between individuals, and to date no exact mechanistic pathway has been elucidated. It has been hypothesised that release of histamine and the triggering of mast cells are related to severe reactions and may involve an IgE-mediated pathway. Risk factors for contrast media reactions include a previous adverse reaction to contrast media, history of atopy, allergy or asthma, younger age and female gender. To date, there are no good studies separating and comparing risk factors with each type of reaction. Moreover, reports indicating that individuals with a previous delayed allergy-like reaction are at increased risk of developing an immediate reaction are inconclusive.

Another risk factor for an immediate reaction is the use of older, ionic high-osmolality contrast media. Since the development of non-ionic, low osmolality contrast media, the incidence of mild to moderate and possibly severe reactions has decreased. However, given the severity of an immediate reaction, premedication is still widely used in clinical practice. The concept of premedication prior to administration of contrast media to prevent an immediate reaction stems from an observational study by Greenberger and Patterson in 1991. The researchers recommended that patients with a previous reaction to high osmolality ionic iodinated contrast media receive oral prednisolone, diphenhydramine and ephedrine as pre-treatment. Since then, clinicians have recommended a variety of pre-treatment regimens.

A systematic review published in the BMJ in 2006 concluded that the data supporting the use of pre-medication in patients with a previous allergic reaction are lacking. The findings suggest that a large number of patients (100 to 150) need to receive a double dose of oral methylprednisolone to prevent one potentially life threatening contrast media reaction. In regards to antihistamines, there is limited evidence to show that this approach may prevent cutaneous reactions. Valid data supporting the efficacy of drug combinations in pre-treatment regimens is completely lacking. Moreover, there are no studies to evaluate the effect of pre-treatment in patients with a previous reaction to non-ionic contrast media. Guidelines issued by the European Society of Urogenital Radiology state that all high risk patients should receive non-ionic contrast media and there is only conclusive agreement on the corticosteroid and antihistamine pre-treatment for those who receive an ionic contrast media.

Given the lack of evidence surrounding pre-treatment, clinicians will most likely use their own discretion in advocating pre-treatment in high risk patients whilst considering the adverse effects of corticosteroids, antihistamines and adrenaline. Regardless of whether pre-treatment is used, the preparedness for the management of an acute adverse reaction is paramount.

This E-Bulletin is based on work by Winnie Tran, Senior Pharmacist, RGH

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