DUQUESNE UNIVERSITY
MYLAN SCHOOL OF PHARMACY

PIC QUESTION OF THE WEEK: 7/21/08

Q: Describe the various localized allergic reactions to insulin and how they can be managed?

A: Injection site reactions to insulin are occasionally *allergic* (mediated by antibody or T-lymphocytes) in nature and include pruritis, erythema, swelling, induration, etc. Three recognized types of local allergic insulin reactions have been identified and characterized as monophasic, biphasic, and tuberculin-like. The monophasic reaction is IgE mediated with mast cell activation resulting in a localized "wheal and flare". This type of reaction usually develops within one week of initiation of therapy and spontaneously resolves in about one hour. Biphasic reactions are associated with IgG and present as an initial "wheal and flare" followed by a late phase that may not peak for 4 to 6 hours. These reactions generally resolve within 24 hours. Delayed tuberculin-like reactions are cell mediated and possess a longer duration than other local reactions. They generally appear 8 to12 hours after administration, peak at 24 hours, and may last several days. They are usually well defined, painful, pruritic, and accompanied by a localized mononuclear infiltrate. *Non-allergic* reactions at the site of insulin injection include bruising, hyperpigmentation, and lipodystrophy (both lipohypertrophy and lipoatrophy). Systemic allergic reactions, including anaphylaxis, can occur; however, they are exceedingly rare with the newer insulin preparations. Local reactions generally result from contaminants or additives (e.g. zinc, protamine, etc.) in the insulin preparation as well as insulin itself. For some patients with repeated local reactions, optimization of oral antidiabetic therapy and discontinuation of insulin may be a viable option. Patients who require insulin do have management options. Initially the dose may be divided and injection sites rotated. If symptoms do not resolve in 2 to 4 weeks, the patient should consult their physician to determine whether alternative forms of insulin are more appropriate. When patients demonstrate allergy to a specific component of the preparation, for example zinc, they may be converted to a non-zinc containing product. Another option is incorporation of 0.1 mcg of dexamethasone per unit of insulin into each injection to decrease pain and inflammation. Oral corticosteroids or antihistamines might be considered to control inflammation and pruritus. If these methods fail, it may be necessary to administer insulin as an intravenous infusion, insert a subcutaneous pump, or initiate a desensitization protocol. There appear to be a number of available methods for managing patients with localized *allergic* reactions to insulin.

References:

- Richardson T, Kerr D. Skin-related complications of insulin therapy: epidemiology and emerging management strategies. Am J Clin Dermatol. 2003; 4(10): 661-67.
- Heinzerling L, Raile K, Rochitz H, et al. Insulin allergy: clinical manifestations and management strategies. Allergy. 2008; 63(2): 148-55.
- McEvoy GK, ed. AHFS Drug Information. Bethesda: ASHP; 2008.

Brittney R. March and Catherine A. Bourg, Pharm.D. Candidates

The PIC Question of the Week is a publication of the Pharmaceutical Information Center, Mylan School of Pharmacy, Duquesne University, Pittsburgh, PA 15282 (412.396.4600).