



Adverse Reactions to Latex Occurring in an Outpatient Dialysis Access Center

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ABSTRACT

Latex allergies have been reported to be present in 1–5% of the general population. Patients with multiple surgeries and frequent exposure have a significant increase in the risk of a serious latex allergy. Reports of latex allergy in dialysis patients who need interventional procedures, however, have been limited. In this analysis, two patients treated at an outpatient

dialysis access center are presented with presumed latex allergies. This report reviews the mechanism of latex allergy and provides important considerations regarding latex allergy. In addition, it calls for heightened awareness of this uncommon but potentially dangerous condition.

While latex allergy is uncommon, its manifestations have a wide spectrum ranging from simple irritant dermatitis to full-blown anaphylactic shock (1–4). This article familiarizes interventionalists with latex allergy and presents the mechanisms of latex allergy. In addition, it presents management and preventive strategies for latex allergy.

Case Reports

Case 1

A 68-year-old female presented to the access center for an angiogram and possible angioplasty of her high venous pressure brachio-basilic arterio-venous fistula (AVF). There were no reported allergies. Consequently, no premedications were administered. Latex gloves were used. Percutaneous balloon angioplasty procedure was performed using 30 ml of a low osmolar contrast agent at a 2:1 dilution. The patient was medicated with 2 mg intravenous (IV) midazolam, 3000 units IV Heparin (not Baxter). Local anesthesia was infiltrated with 2% lidocaine. The procedure was uneventful and an angioplasty of an 80% mid-basilic vein lesion was performed. Toward the end of the procedure, the patient developed a cough and became nauseated. This was followed by hypotension (60–70 systolic) and hypoxia with oxygen saturations in the 70–80% range. She was promptly treated with 0.3 mg subcutaneous 1:1000 epinephrine, 125 mg IV methylprednisolone, 50 mg IV diphenhydramine, and transported via ambulance to the hospital.

She responded well to treatment, received her dialysis treatment, and was discharged home the following day with no adverse consequences.

Six weeks later, the patient returned to the access center with a thrombosed AVF. The prior event was presumed to be an IV contrast dye allergy. Therefore, the decision was to place a right internal jugular tunneled dialysis catheter with no IV contrast dye. The patient received lidocaine with epinephrine for local anesthesia and normal saline flush mixed with a small amount of heparin (not Baxter) was used to clear the lines. Conscious sedation was not used. Latex gloves were used. A 1–2 cm venotomy incision was made after the micro-puncture needle was placed in the vein using ultrasound guidance and a guidewire was passed into the inferior vena cava. Shortly thereafter, the patient became hypotensive and hypoxic. At this point, the procedure was terminated. She was given 50 mg IV Benadryl and transported to the hospital. She stabilized rapidly in the emergency room and was admitted to a monitored bed. She received dialysis the next day and discharged shortly thereafter in stable condition with no adverse consequences.

Case 2

A 41-year-old female presented to the dialysis access center for a de novo tunneled catheter placement. She had been doing poorly on peritoneal dialysis and plans were to initiate hemodialysis therapy. She reported a prior history of IV contrast dye allergy. She was not premedicated and no contrast was placed on the table. Latex gloves were used. A right internal jugular 28 cm tunneled catheter was placed using ultrasound guidance and local lidocaine with epinephrine. A 1–2 cm venotomy incision was required for placement. The patient did receive 2 mg IV midazolam for sedation and the lines

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were flushed with normal saline mixed with a small amount of heparin (not Baxter). The patient did well until the end of the procedure when the retention suture was being placed. At this point, she developed profound itching. Further examination revealed significant total body urticaria. She showed no signs of respiratory or hemodynamic compromise. Treatment was given with IV diphenhydramine and IV methylprednisilone. She was transported to the hospital, where she showed gradual improvement. She was found to be profoundly uremic and emergently dialyzed that evening using the tunneled catheter that was placed at the access center. She was discharged home the following day in stable condition. The urticaria had completely resolved.

Discussion

Latex allergies are present in a significant number of patients. The general population has a 1–5% risk, healthcare workers have a 2–17% risk, and spina bifida patient or patients who have had multiple urogenital procedures have a 20–68% risk (1–4). Dialysis patients because of their frequent exposures to latex appear to have an increased risk of latex allergies, though no definitive data are available. The two patients presented were both presumed to have an intravenous contrast dye allergies from prior procedures. Even though precautions were taken to prevent any contrast exposure, both patients had reactions that appeared to be similar to contrast dye. Latex appears to be the most likely cause in these two cases.

Latex is a product produced from a milky fluid from a lactiferous cell of a rubber tree. There have been over 200 polypeptides isolated, all of which have allergic potential. Freshly harvested latex is treated with ammonia and other preservatives at the site of harvesting. Increased demand for latex has lowered the quality of this on-site processing and may account for some of the increased incidence of latex allergies being seen.

Three distinct syndromes are observed with latex allergies. The first syndrome is an irritant dermatitis. This appears to be more of a chemical reaction with the skin and is not immune system activated. A Type IV contact dermatitis that occurs via a delayed hypersensitivity reaction is the most common. The final syndrome is a Type I immediate hypersensitivity IgE-mediated reaction. This is the most serious syndrome and triggers massive histamine release from mast cells which can lead to urticaria and in its worst form anaphylaxis. Latex proteins are highly allergenic and even small quantities in sensitized patients can lead to these syndromes.

Exposure to latex proteins can occur via skin, mucous membrane, visceral, or peritoneal contact (1–4). In the patients reported, a venotomy incision was made which exposed underlying tissue that may have made the latex reaction more prominent. Certainly, placement of catheters through sheaths that have been touched by latex gloves can also expose the patient to these highly allergenic compounds. Powdered gloves have been shown to increase sensitization of patients to latex because the powder can absorb the latex proteins. Powder-free

gloves are better, but still allow latex exposure to patients.

In patients who have known latex allergies, there have been reports of cross reactivity with various foods. The most common foods are avocado, banana, chestnut, kiwi, papaya, peach, and nectarines. When a history is obtained, asking about food allergies may be something to consider as this may reveal a potential latex allergy when performing interventional dialysis access procedures.

Physical examination findings that may show a latex allergy are fairly obvious. A delayed rash with erythema, edema, and papules suggests a Type IV allergic reaction. Urticaria is a Type I reaction and usually occurs immediately upon exposure. Other Type I signs may include angioedema, rhinitis, stridor, wheezing, respiratory failure with hypoxia, and hemodynamic instability compatible with shock.

Many products contain latex. Gloves are the most obvious, but tourniquets and stethoscopes may have latex. Drains, dental dams, shoe soles, erasers, computer mouse pads, rubber bands have all been reported to possibly contain latex. Rubber-topped multidose vials may also exist. Oxilan, the contrast used in the above two cases, is however, topped with a silicone stopper.

Most products that are used in access centers are latex and natural rubber free, but there are a few exceptions. In our center, the gloves are the most likely source. Some tourniquets, pressure dressings, and a few sheaths have latex in them. The boxes and packaging usually is clearly marked. However, some products have limited information on them and the manufacturer should be contacted if there are any questions.

Laboratory studies may be performed to identify a latex allergy, but because of the numerous number of allergenic proteins, they are not all that reliable. A total serum IgE level may be elevated. A radioallergosorbent test for latex allergy is 50–100% sensitive and 64–100% specific in studies. An ELISA test can be performed. Skin patch testing for Type IV allergy can also be performed. Decisions about testing should be deferred to an allergist/immunologist.

The best treatment for a latex allergy is prevention. Those patients who are at high risk, have had a previous latex reaction, or an unexplained adverse interventional procedure should have a latex-free environment for their procedures. Resuscitative equipment should be latex free, but this should be verified in each center. All labels on supplies and medical devices should be read and verified as latex free. Lastly, patients need to be informed about this issue. If they have had a reaction in the past, the next one may be more serious. The American Latex Allergy Association and others have excellent information regarding latex allergy and is useful for patients and providers (1–4). Additionally, the Occupational Health and Safety Administration has information about latex for healthcare workers and other at-risk employees (1–4).

In summary, two cases were presented of patients with presumed IV contrast dye allergies that most likely had adverse events because of latex exposure. Recently, the Johns Hopkins Medical Institution became completely

latex free because of the risks outlined above. Given this information, a decision to be latex free in freestanding dialysis access centers may be worth considering. Certainly, if a center is not latex free, close monitoring for serious adverse reactions to latex should be undertaken. Ultimately, awareness and appropriate prevention of latex allergies should be encouraged so that serious reactions to latex occur infrequently when doing outpatient procedures in freestanding dialysis access centers.

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