Practice sting Particles in Injections and Infusions

This Practice Sting is particularly relevant for (hospital) pharmacists and healthcare professionals who prepare injections and infusions for administration.

When preparing injections and infusions for administration, particles from the rubber stopper of the vial may occasionally enter the solution, as illustrated by the following reports.

Incidents

1. A woman receives a hydrocortisone injection. The nurse prepares the injection by injecting water for injection through the rubber stopper into the vial containing hydrocortisone powder. After dissolving, she notices a particle in the solution, likely originating from the vial's rubber stopper.
2. A man is prescribed 37.5 mg of prednisolone sodium succinate. This requires 1.5 vials of 25 mg prednisolone sodium succinate powder. The nurse reconstitutes the powder according to protocol. While drawing up the solution, a piece of rubber enters the syringe. She does not use a filter needle, as the hospital protocol does not require it.

Analysis

Liquids intended for intravenous use must be clear and free of particles. Particles may originate from the glass of the ampoule or the rubber stopper of the vial. These particles can cause capillary blockages, as they travel through the bloodstream and become lodged in the capillary network, potentially leading to (thrombo)phlebitis and embolism.

Therefore, it is important to use a filter needle when drawing fluid from a glass ampoule. Opinions differ regarding drawing fluid through a rubber stopper. The Dutch 2022 VTGM (Preparation for Administration) guideline recommends using a filter needle. However, van den Berg et al advises against using filter needles when drawing injection fluid through a vial's rubber stopper. The reasons include:

- The number of non-visible particles is similar with and without a filter needle, and both meet legal standards.
- Drawing fluid with a filter needle requires more force, which may lead to joint strain and RSI complaints.
- Filter needles are more prone to clogging.
- Non-filter needles are significantly cheaper.

Recommendations

For (Hospital) Pharmacists

- Determine which type of needle should be used when preparing injection and infusion fluids for administration. Include this in the organisation's Parenteral Handbook.

For Healthcare Professionals Preparing Injections and Infusions

- Use the needles as prescribed in the organisation's *Parenteral Handbook* when preparing injection and infusion fluids.
- Check that the prepared solution is clear and free of particles before administration.