Vaccine/Immunization, ID Snapshot

ID Snapshot: How to reduce pain during vaccination
by H. Cody Meissner M.D., FAAP

Concern about pain associated with vaccine injection is common among caregivers, vaccine recipients and health care personnel. Several methods have been shown to alleviate discomfort and pain associated with vaccination.

Are the following statements true or false?

a) To reduce discomfort, it is permissible to administer a reduced volume at multiple vaccination visits as long as the total volume administered equals a full dose.

b) It is not necessary to repeat a dose of vaccine administered inadvertently by the intramuscular (IM) route when recommended to be administered by the subcutaneous route.

c) Evidence indicates that use of 5% topical lidocaine/prilocaine emulsion does not interfere with the immune response to measles-mumps-rubella vaccine.

d) Use of an oral analgesic before or at the time of vaccination has been shown to prevent febrile seizures in children with previous febrile seizures.

e) When multiple vaccines are co-administered, the most painful vaccine should be administered first.

f) Aspiration should be done during IM injection of a vaccine.

Answer: a is false; b is true; c is true; d is false; e is false; f is false

Non-standard vaccination practices such as variation from the recommended volume or shortened intervals may result in inadequate protection against disease. Any vaccination using less than the standard dose should not be counted, and the person should be revaccinated according to schedule unless serologic testing indicates that a protective immune response has developed.

The route of administration of injectable vaccines is determined in part by the presence of an adjuvant. Inactivated vaccines containing an adjuvant should be injected into a muscle because subcutaneous administration may cause local irritation, induration, skin discoloration, inflammation and granuloma formation. Inadvertent subcutaneous administration of a vaccine recommended for the IM route is unlikely to alter the immune response. Response to vaccines recommended to be administered by the subcutaneous route is unlikely to be affected if the vaccine is inadvertently administered by the IM route.

Topical anesthetic agents applied to the skin may help to reduce the pain of an injection. Eutectic mixture of local anesthetics (EMLA) (lidocaine 2.5%/prilocaine 2.5%) is approved by the Food and Drug Administration (FDA) for patients older than 37 weeks’ gestational age and should be applied 60 minutes before the injection. EMLA should not be used on infants younger than 12 months who are receiving treatment with methemoglobin-inducing agents (such as chloroquine, dapsone or sulfonamides) because of the possible development of methemoglobinemia. Lidocaine 4% is approved by the FDA for children older than 2 years, and pretreatment should be applied 30 minutes before the injection. Ethyl chloride sprayed onto a cotton ball that is then placed over the injection site for 15 seconds decreases injection pain in school-age children. Data indicate no known adverse effect of topical anesthetics on the immune response.
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Evidence does not support the routine use of oral analgesics before or at the time of vaccination. Reduced immunogenicity of some vaccines may be associated with prophylactic use of acetaminophen. An oral analgesic may be used for treatment of fever and local discomfort following immunization. Studies of children with previous febrile seizures have not demonstrated antipyretics to be effective in the prevention of febrile seizures.

Children often receive more than one vaccine injection at a single visit. Some vaccines are more painful than others. Vaccines should be administered in the order of increasing painfulness with the most painful vaccine administered last.

The needle should be plunged rapidly through the skin without aspiration. Aspiration before injection is not necessary because large blood vessels are not present at the recommended injection sites, and pain may be increased because of longer needle dwelling time in the tissue and wiggling of the needle.

Warming a vaccine by rubbing it between the hands is not recommended because of concern for altering vaccine effectiveness. Use of gloves is not required when administering a vaccine unless there is a risk of contact with potentially infectious body fluids. Changing needles between drawing vaccine from a vial and injection is not necessary unless the needle has been contaminated or damaged.

Breastfeeding should be encouraged during immunization. Breastfeeding appears to have a beneficial effect because of skin-to-skin contact, the child being held, the act of sucking and the sweet taste of human milk. As an alternative, a sweet tasting solution such as a few milliliters of 25% sucrose can be provided during vaccine administration.

Children 3 years of age or younger should be held during vaccine injection. Adolescents should be seated or lying during vaccination to reduce the risk of injury should syncope develop.

Jet injectors force a pressurized liquid stream through the skin to deliver intradermal, subcutaneous or IM vaccines. Jet injectors avoid issues associated with needlestick injuries and disposal. The immune response to immunization with a jet injector appears to be non-inferior to the immune response following a needle injection. Local reactions may be more frequent following vaccination with a jet injection compared to needle administration.

Dr. Meissner is professor of pediatrics at Floating Hospital for Children, Tufts Medical Center. He also is an ex officio member of the AAP Committee on Infectious Diseases and associate editor of the AAP Visual Red Book.

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