Does Patient Position Affect Administration of Intranasal Agents

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The volume of medication administered by an atomizer was 14 times greater when used on a mannequin in the supine versus upright position.

A concern with squeeze-bottle atomizers that administer intranasal medications is that they cannot ensure delivery of precise amounts of agents such as vasoconstrictors and local anesthetics, and, as a result, they may cause inadvertent overdosing and subsequent hypertension, intracranial hemorrhage, or pulmonary edema.

To determine if patient position affects the volume of liquid delivered by these devices, 10 anesthesia residents experienced in intranasal-medication administration were asked to squeeze water from a 25-mL atomizer (similar to pharmacy-supplied squeeze bottles containing phenylephrine and aqueous lidocaine) into the nostril of a mannequin placed in several head positions (0, 15, 30, 45, and 90 degrees). In addition, several starting amounts of water were dispensed (20, 15, 12.5, and 10 mL). The weight of the bottle was measured before and after use, and the difference was converted to volume and phenylephrine dose.

The mean volume was 14 times greater (0.56 vs. 0.04 mL) when the mannequin was supine (0 degrees) versus upright (90 degrees), which would correspond to an additional 1300 mcg of phenylephrine. The amount dispensed was also significantly greater when the mannequin was semi-upright (≤30 degrees) versus upright and when the bottles had higher starting volumes. The volume delivered at 45 degrees was the same as that delivered at 90 degrees.

Comment: To avoid accidental overdose when squeeze-bottle atomizers are used, medications should be administered when the patient is upright or at an angle of ≥45 degrees, and bottles should not be more than half filled.

Citation(s):

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