

Detergent Effects of Sodium Deoxycholate Are a Major Feature of an Injectable Phosphatidylcholine Formulation Used for Localized Fat Dissolution

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Background. Phosphatidylcholine injections are becoming an increasingly popular technique to treat localized fat accumulation. This formula is composed primarily of phosphatidylcholine and sodium deoxycholate, a bile salt used to solubilize the natural phospholipid in water. The mechanism through which this injectable phosphatidylcholine formulation causes localized fat reduction is unknown.

Objective. To investigate the active component and mechanism of action of an injectable phosphatidylcholine formulation in clinical use.

Methods. Cell viability and cell membrane lysis assays were performed on cell cultures and porcine skin after treatment with the phosphatidylcholine formula, isolated sodium deoxycholate, or common laboratory detergents Triton-X 100 and Empigen BB. In addition, we described the histologic changes after injection of these substances into porcine tissue.

Results. A significant and comparable loss of cell viability, cell membrane lysis, and disruption of fat and muscle architecture was seen in cell cultures and tissue specimens treated with the phosphatidylcholine formula and isolated sodium deoxycholate. These findings were similar to the effects produced after treatment with laboratory detergents.

Conclusions. The phosphatidylcholine formula popularly used in subcutaneous injections for fat dissolution works primarily as a detergent causing nonspecific lysis of cell membranes. Our findings suggest that sodium deoxycholate is the major active component responsible for cell lysis. Detergent substances may have a role in eliminating unwanted adipose tissue. It is advised that physicians use caution until adequate safety data are available.

ADAM M. ROTUNDA, MD, HIROYUKI SUZUKI, BS, RONALD L. MOY, MD, AND MICHAEL S. KOLODNEY, MD, PHD HAVE INDICATED NO SIGNIFICANT INTEREST WITH COMMERCIAL SUPPORTERS.