

Journal Watch

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Full Reference: Jorgensen JT, Romsing J, Rasmussen M, Moller-Sonnergaard J, Vang L, Musaeus L. Pain Assessment of Subcutaneous Injections. *Ann Pharmacother* 1996; 30:729-32.

Abstract:

Objective: To compare injection pain after subcutaneous administration of four different solution volumes.

Design: Double-blind, randomized, prospective, multiple crossover study.

Setting: Steno Diabetes Centre, Gentofte, Denmark.

Participants: Eighteen healthy volunteers, 9 women and 9 men, aged 21-30 years.

Methods: the subjects were injected with four different volumes (0.2, 0.5, 1.0, 1.5 mL) of NaCl 0.9%. The study was performed on 2 days with a 1-week washout period between the study days. On each study day the subjects received four injections in each thigh. To evaluate the validity of our pain assessing model the subjects received eight injections of 0.5 mL on one of the study days. Pain assessment was done immediately after each injection using both a 10-cm visual analog scale (VAS) and a six-item verbal rating scale (VRS).

Results: A significant difference in pain score on both the VAS ($p < 0.05$) and the VRS ($p < 0.01$) was seen between the four injection volumes. The pain was significantly increased with volumes of 1.0 and 1.5 mL. No significant difference in injection pain could be detected between 0.2 and 0.5 mL and between 1.0 and 1.5 mL. No significant period or carryover effect could be detected in the study. A significant correlation between the pain score on the VAS and the pain score on the VRS was found ($r = 0.79$, $p < 0.0001$).

Conclusions: the pain of a subcutaneous injection is related to injection volume in the thigh. The results show that increasing the volume from 0.5 to 1.0 mL increases pain significantly. The findings from this study should be considered when injection preparations for subcutaneous administration are formulated. The volume should generally be less than 1.0 mL if injected into the thigh.

Comments

Strengths/uniqueness:

There is very little literature investigating the relationship of the volume of a SQ injection to the pain at the injection site. This study was double-blinded, randomized and prospective.

Weaknesses:

The injection site investigated was the thigh - a site not commonly used in drug administration in palliative care. Also the volunteers were young and healthy. The sample size was small - 18 patients.

Relevance to Palliative Care:

Many factors influence the pain of sub-cutaneous injections and being able to mitigate some of them is always a consideration for patient care.