In-vivo evaluation of simultaneous administration of incompatible drugs in a central venous catheter with a decreased port to port distance

ABSTRACT

The use of a triple-lumen catheter with a distance of 0.4cm between the proximal port and the medial port and 1.3 cm between the medial port and the distal port, for the in vivo simultaneous administration of incompatible solutions does not result in precipitates large enough to cause adverse clinical effects.

INTRODUCTION

Introduction A multilumen central venous catheter is the preferred vascular access route for critically ill patients requiring multiple drug infusions, parenteral hyperalimentation, and other potentially incompatible drugs. The complexity of delivering these substances becomes more difficult when the size and length of the catheter is limited, as in the pediatric population. A previous study has shown that in vivo simultaneous intravenous infusion of physically incompatible substances through a commercially available multiple lumen intravenous catheter, double-lumen peripheral venous catheter (IV–01100, Arrow International, Reading, Pennsylvania, USA) did not cause precipitation in the vascular system or other adverse clinical effects. This study looked at a modified 5.5 F × 5 cm, triple-lumen catheter with a port distance of 0.4 cm between the medial and proximal ports and 1.3 cm between the distal and medial ports (Arrow International), with a total distance of 1.7 cm between the distal port and the proximal port, to assess if decreased port spacing between lumens causes precipitation when incompatible intravenous solutions are administered simultaneously.

CONCLUSION

Using previously published methodology for the study of the simultaneous administration of incompatible drugs via a multiple lumen catheter, we conclude that the use of a triple-lumen catheter with a port distance of 0.4 cm between the medial and proximal ports, 1.3 cm between the distal and medial ports, 1.7 cm between the distal and proximal lumens, and overall length of 5 cm, for the in vivo administration of incompatible solutions, phenytoin and TPN, using a swine model, did not lead to precipitates large enough to cause adverse clinical effects in our study. This modified catheter was developed to minimize the length of the catheter for use in the smallest possible patients and to decrease the possibility that one of the lumens might be positioned improperly, resulting in the potential for extravasation of fluids or drugs.