

Compatibility of Oxytocin, Zidovudine, and Penicillin G

Intravenous zidovudine is used during the intrapartum period as part of a regimen that has been shown to reduce maternal-to-infant transmission of HIV.¹ When vaginal delivery is considered, issues of intravenous compatibility may arise, especially if induction of labor is attempted with an infusion of oxytocin and if the mother is a carrier of group B Streptococcus. In this setting, intrapartum penicillin G is recommended to prevent early-onset group B streptococcal disease in the newborn.²

To assess the Y-site compatibility of oxytocin, zidovudine, and penicillin G, we completed a visual compatibility study evaluating mixtures of oxytocin 20 units in 1000 mL of 2/3-1/3, zidovudine 400 mg in 100 mL of either dextrose 5% in water (D5W) or 0.9% sodium chloride (NS), and penicillin G sodium 2.5 or 5 million units in 100 mL of either D5W or NS. Because the flow rate of the selected concentrations might vary between patients, we prepared the mixtures in a range of volumes to simulate a range of flow rates. As presented in Table 1, solutions 1 through 8 were created by mixing equal (1-mL) volumes of each of the specified solutions, whereas for solutions 17 through 24, 1 mL of oxytocin, 2 mL of zidovudine, and 5 mL of penicillin G were mixed.

A total of 40 solutions (to cover all combinations of diluent, concentration, and flow rate possibilities) were prepared (Table 1) in clean, clear-glass test tubes. Colour, clarity, evolution of gas, and the absence or presence of particles were evaluated at time zero (immediately after mixing) and at 2, 24, and 72 hours after mixing. The pH was measured at 72 hours.

Gas was not produced on mixing of any of the combinations. Throughout the 72-hour period all

solutions remained clear and colourless, and particles of visible size were not evident. The pH of the solutions at 72 hours ranged between 5.51 and 6.13 (Table 1).

We conclude that solutions of oxytocin 20 units in 1000 mL of 2/3-1/3, zidovudine 400 mg in 100 mL of either D5W or NS, and penicillin G sodium 2.5 or 5 million units in 100 mL of D5W or NS are compatible for over 72 hours. Although contact time beyond the Y site in an intravenous line varies with flow rate, it is never more than a few minutes. Therefore, we conclude that these solutions would be compatible in a Y-site infusion.

References

1. Connor EM, Sperling RS, Gelber R, Kiselev P, Scott G, O'Sullivan MJ, et al., for the Pediatric AIDS Clinical Trials Group Protocol 076 Study Group. Reduction of maternal-infant transmission of human immunodeficiency virus type 1 with zidovudine treatment. *N Engl J Med* 1994;331:1173-80.
2. American Academy of Pediatrics. Revised guidelines for prevention of early-onset group B streptococcal infection. *Pediatrics* 1997;99:489-96.

Cindy Oliver, BScPhm
Department of Pharmacy
Sunnybrook and Women's College Health Sciences Centre
Women's College Campus
Toronto, Ontario

Shirley Law, DipPharmTech
Department of Pharmacy
Sunnybrook and Women's College Health Sciences Centre
Sunnybrook Campus
Toronto, Ontario

Table 1. Mixtures of Oxytocin, Zidovudine, and Penicillin G Sodium Tested for Compatibility

Ratio (by volume) Oxytocin 20 units/L and mixture identifier	Oxytocin 20 units/L		Zidovudine 400 mg/100 mL		Penicillin G Sodium			pH
	Volume	Diluent	Volume	Diluent	Concentration (units/100 mL)	Volume	Diluent	
1:1:1 mixtures								
1	1 mL	2/3 + 1/3	1 mL	D5W	5 million	1 mL	D5W	6.07
2	1 mL	2/3 + 1/3	1 mL	D5W	2.5 million	1 mL	D5W	6.13
3	1 mL	2/3 + 1/3	1 mL	D5W	5 million	1 mL	NS	6.07
4	1 mL	2/3 + 1/3	1 mL	D5W	2.5 million	1 mL	NS	6.11
5	1 mL	2/3 + 1/3	1 mL	NS	5 million	1 mL	D5W	5.93
6	1 mL	2/3 + 1/3	1 mL	NS	2.5 million	1 mL	D5W	6.03
7	1 mL	2/3 + 1/3	1 mL	NS	5 million	1 mL	NS	5.97
8	1 mL	2/3 + 1/3	1 mL	NS	2.5 million	1 mL	NS	6.10
5:2:5 mixtures								
9	5 mL	2/3 + 1/3	2 mL	D5W	5 million	5 mL	D5W	5.88
10	5 mL	2/3 + 1/3	2 mL	D5W	2.5 million	5 mL	D5W	5.85
11	5 mL	2/3 + 1/3	2 mL	D5W	5 million	5 mL	NS	5.86
12	5 mL	2/3 + 1/3	2 mL	D5W	2.5 million	5 mL	NS	5.59
13	5 mL	2/3 + 1/3	2 mL	NS	5 million	5 mL	D5W	5.75
14	5 mL	2/3 + 1/3	2 mL	NS	2.5 million	5 mL	D5W	5.78
15	5 mL	2/3 + 1/3	2 mL	NS	5 million	5 mL	NS	5.76
16	5 mL	2/3 + 1/3	2 mL	NS	2.5 million	5 mL	NS	5.51
1:2:5 mixtures								
17	1 mL	2/3 + 1/3	2 mL	D5W	5 million	5 mL	D5W	5.95
18	1 mL	2/3 + 1/3	2 mL	D5W	2.5 million	5 mL	D5W	6.02
19	1 mL	2/3 + 1/3	2 mL	D5W	5 million	5 mL	NS	5.85
20	1 mL	2/3 + 1/3	2 mL	D5W	2.5 million	5 mL	NS	5.65
21	1 mL	2/3 + 1/3	2 mL	NS	5 million	5 mL	D5W	5.79
22	1 mL	2/3 + 1/3	2 mL	NS	2.5 million	5 mL	D5W	5.84
23	1 mL	2/3 + 1/3	2 mL	NS	5 million	5 mL	NS	5.71
24	1 mL	2/3 + 1/3	2 mL	NS	2.5 million	5 mL	NS	5.56
5:1:5 mixtures								
25	5 mL	2/3 + 1/3	1 mL	D5W	5 million	5 mL	D5W	5.79
26	5 mL	2/3 + 1/3	1 mL	D5W	2.5 million	5 mL	D5W	5.77
27	5 mL	2/3 + 1/3	1 mL	D5W	5 million	5 mL	NS	5.75
28	5 mL	2/3 + 1/3	1 mL	D5W	2.5 million	5 mL	NS	5.52
29	5 mL	2/3 + 1/3	1 mL	NS	5 million	5 mL	D5W	5.75
30	5 mL	2/3 + 1/3	1 mL	NS	2.5 million	5 mL	D5W	5.74
31	5 mL	2/3 + 1/3	1 mL	NS	5 million	5 mL	NS	5.74
32	5 mL	2/3 + 1/3	1 mL	NS	2.5 million	5 mL	NS	5.51
1:1:5 mixtures								
33	1 mL	2/3 + 1/3	1 mL	D5W	5 million	5 mL	D5W	5.87
34	1 mL	2/3 + 1/3	1 mL	D5W	2.5 million	5 mL	D5W	5.94
35	1 mL	2/3 + 1/3	1 mL	D5W	5 million	5 mL	NS	5.76
36	1 mL	2/3 + 1/3	1 mL	D5W	2.5 million	5 mL	NS	5.62
37	1 mL	2/3 + 1/3	1 mL	NS	5 million	5 mL	D5W	5.79
38	1 mL	2/3 + 1/3	1 mL	NS	2.5 million	5 mL	D5W	5.83
39	1 mL	2/3 + 1/3	1 mL	NS	5 million	5 mL	NS	5.75
40	1 mL	2/3 + 1/3	1 mL	NS	2.5 million	5 mL	NS	5.57

CSHP extends its apologies to Novopharm for the difficult situation created by the late production of the Spring issue of the Journal. Unfortunately procedural inconsistencies resulted in an incorrect and untimely ad being run as part of the first issue in 2001. We are particularly sensitive and regretful that this error befall one of the Society's major sponsors.

James L. Mann
Executive Director

