TITLE: DELIBERATE HYPOTENSION WITH NICARDIPINE DURING SPINE FUSION FOR SCOLIOSIS

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It has been suggested that nicardipine (N) can be a safe alternative to sodium nitroprusside (SNP) in inducing deliberate hypotension (DH) during total hip arthroplasty.[1] However, no information is available for long-duration surgery.

After Ethics Committee approval, 20 ASA I patients (30±2.6 yr) scheduled for spine fusion were studied during isoflurane anesthesia (mean ET conc. = 0.6 vol%). Patients, randomly assigned to 2 groups (n=10), received either a continuous infusion of N (after a loading dose) or SNP to achieve MAP=55-60 mmHg. Hemodynamic data (7.5 Fr Swan Ganz catheter) and samples for plasma N determination were collected before DH (C), 20, 80 and 140 min during DH (D20, D80 and D140 respectively), at the end of DH (DEnd) and 20 and 80 min after DH (A20 and A80 respectively). ANOVA with Bonferroni correction was used for statistics.

DH was achieved with SNP (3.6±0.8 $\mu g.kg^{-1}.min^{-1}$; total dose = 45±10 mg) and with N: loading dose = 107±16 µg/kg; maintenance doses = 0.92±0.07 $\mu g.kg^{-1}.min^{-1}$ during the 1st hour; 0.83±0.07 $\mu g.kg^{-1}.min^{-1}$ for the 2nd hour and then 0.53±0.12 $\mu g.kg^{-1}.min^{-1}$; total dose = 18±2 mg. N was discontinued in 2 patients before the intended end of DH was reached. Data are summarized in the Table. In both groups, no changes in HR or PCWP nor any hypertensive rebound were observed. DH duration was 264±16 min.

For long-duration administration, N may be an alternative to avoid SNP toxicity. In our study, stable hypotension required a decrease in N infusion rate; although N residual plasma concentration was low, MAP did not reach its control value 20 min after DH. Our data suggest that N results in potent cumulative and durable vasodilatory effects. These effects might be clinically disadvantageous in some surgical situations such as operative difficulties and unpredictable bleeding.

References

1. ANESTHESIOLOGY 69: A37, 1988

	MAP (mmHg)		CI ($L.min^{-1}.m^{-2}$)		SVR (UI/m2)		N conc. (ng/ml)
	N	SNP	N	SNP	N	SNP	
C	68±1	79±3	2.5±0.1	2.7±0.1	26.7±1.5	28.1±1.4	0
D 20	59±1*	57±1*	3.6±0.3*	3.6±0.2*	16.4±1.6*	15.2±0.8*	111±20
D 80	58±2*	56±1*	3.6±0.2*	3.6±0.3*	15.7±1.0*	14.9±1.2*	93±8
D 140	55±2*	55±1*	3.4±0.1*	3.5±0.3*	15.6±0.9*	14.9±1.1*	76±8
D End	57±2*	57±1*	3.4±0.3*	3.2±0.2*	16.9±1.6*	17.0±1.1*	38±10
A 20	60±3*	73±4†	3.5±0.3*	3.0±0.2*	17.1±1.2*	22.5±1.2*†	21±4
A 80	79±5*	96±5*†	4.0±0.3*	3.6±0.2*	19.2±1.3*	19.0±1.0*	15±2

mean±SEM
versus C: * $p < 0.05$; versus N: † $p < 0.05$

TITLE: MULTIPLE DOSE ADMINISTRATION OF DDAVP IN UNCOMPLICATED CARDIAC SURGERY

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We examined the effects of single or repeated doses of desmopressin on blood loss in uncomplicated cardiac surgery, while assessing its potential for thrombogenic side effects.

Prior IRB approval and informed consent were obtained in all pts. 70 pts undergoing elective CABG were studied. Pts were randomized into 3 blinded groups: Group I, DDAVP (0.3 µg/kg) IV after CPB and 12 hours later in the ICU; Group II, DDAVP (0.3 µg/kg) IV after termination of CPB and saline (placebo) 12 hrs later in the ICU; Group III, saline (placebo) IV after CPB and 12 hrs later in the ICU. Inclusion criteria were pts scheduled for CABG with no recent history of antiplatelet/anticoagulant administration. Exclusion criteria were mediastinal exploration for bleeding or hemodynamic instability pre- or post-CPB prior to DDAVP administration. Preoperative and postoperative bleeding time (BT), PT, PTT, platelets (PLT) as well as EKG, CPK and CPKMB were obtained in all pts. Blood loss and blood component utilization was measured. A non-parametric Mann-Whitney U test and chi-square were performed for statistical analysis.

70 pts were randomized, 5 pts were excluded from study. There were 22 pts in Group I, 21 pts in Group II and 22 pts in Group III. Blood loss and BT decreased for Group I at 24 hrs ($p<0.04$) when compared to Group III, however, no other differences were observed. Blood component utilization was identical in all groups. There were 4 MIs recorded in Group I, 2 in Group II and 1 in Group III.

The use of DDAVP in complicated cardiac surgery to decrease blood loss has been reported[1], however, its current use in uncomplicated cardiac surgery remains doubtful.[2] We found that DDAVP as a single or repeated dose was of no benefit in decreasing total blood loss in pts undergoing elective CABG. Only blood loss in the first 24 hrs was decreased in the multiple dose group, with a correspondingly small decrease in bleeding time. DDAVP was associated with a higher rate of perioperative MI, although the results did not reach statistical significance.

We conclude that in routine CABG, the prophylactic use of multi-dose DDAVP does not decrease blood loss and may have potentially dangerous side effects.

1) Salzmann EW, et. al. NEJM 314:1402-1406, 1986.
2) Hackman T, et. al. NEJM 321:1437-1443, 1989.

	Group I	Group II	Group III
	(Median Values)		
BLOOD LOSS			
Intraoperative (ml)	168	224	190
Postoperative (ml)	691*	850	1000
Total	929	1157	1180
COAGULATION AT 24 HRS			
Bleeding Time (Sec)	315*	357	420
PT (Sec)	16	17	16.1
PTT (Sec)	28	27	28
PLT Count	113	108	116

* $p<0.05$ (Compared to Group III)