Title: THE EFFECTS OF EPIDURAL MORPHINE ON POST OPERATIVE ANALGESIA.

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Introduction:

Epidural morphine has been used with increasing frequency for postoperative analgesia. Case records and limited small studies abound, with reports of serious side effects as well as claims of effectiveness for producing pain relief. Many authors and editorialists have called for the need to conduct definitive randomized double blind studies to accurately assess efficacy, dose, and safety. The results of a prospective double blind study evaluating the dose response relationship of four doses of morphine sulfate (MS) given epidurally to postoperative vascular surgical patients are reported. Most authors have determined that the onset of epidural MS analgesia is from thirty minutes to one hour. In an attempt to provide a "painfree" postoperative experience, onset was not evaluated and the dose was given before the regression of the local anesthetic block.

Materials and Methods:

34 patients aged 54-80 undergoing femoral popliteal bypass surgery were studied after obtaining informed consent as approved by our Human Research Committee. No patients who were chronic users of narcotic analgesics were included. All patients were premedicated with Diazepam 10mg P.O. and were successfully anesthetized for surgery using Lumbar catheter epidural anesthesia (1.5% Etidocaine with epi. or 0.75% bupivacaine). After arrival in the recovery room and before the local anesthetic blockade had regressed all patients received an epidural injection of 0,2,5, or 10 mg. of preservative free MS in 10 ml. of normal saline. The catheter was then removed. Patients were observed for 24 hours after epidural injection. BP, P, R, Visual Analog Pain Scale (VAS), nausea, vomiting, itching, and additional analgesic drug requirements were recorded at 0,½,1,2,4,8,11, 12,16,20 and 24 hours post injection. A single arterial blood gas was taken 11 hours post injection (a time which was shown to be at the nadir of CO2 response after a single epidural morphine injection (1). Differences between dose levels were compared using non-parametric analysis. (Krushal-Wallis and Wilcoxon).

Results:

All 4 dose groups were matched demographically. We did not find a specific time period which demonstrated a significant break in the VAS between the 4 groups. The cumulative 24 hour VAS showed a significant relationship for dose despite adequate additional parenteral medication when requested ($p<0.05$) indicating better overall analgesia with epidural MS. The number of patients who required additional postoperative analgesia during the 24 hour study period is seen below:

Dose/N	0mg/8	2mg/8	5mg/9	10mg/9
No Medication	25%	37%	44%	77%
Medication	75%	63%	56%	23%

Anova Significant for dose $p<0.0$

We saw no clinical evidence of respirator depression in any patient at any dose. The 11 hou PaCO2 showed a significant relationship for dose ($p<0.05$)

Dose	0mg	2mg	5mg	10mg	
PaCO2	39±1	39±1	39±1	45±1.6	(mean ± S.E.)

There appeared to be a break point in the PaCO between 5 and 10 mg. of MS which was statistically significant. ($p<0.01$) The highest measured PaCO was 58mmHg and no patient required naloxone t reverse the respiratory depression. Somnolance wa not observed. Nausea occurred in 7 patients an itching in 4 patients with no relation to dose One patient with nausea and one with itching wa from the control group.

Discussion:

This study demonstrated that epidural morphin can provide adequate, safe and long lastin postoperative analgesia. The technique o administering morphine before regression of local anesthetic analgesia made it possible to provide pain free experience for the patient in th postoperative period. There were significan advantages in our study to the 10 mg. dose fo postoperative analgesia. The significant increas in $PaCO_2$ with the 10mg group is indicative of impending danger of respiratory depression. This suggests that perhaps a dose intermediate between and 10mg may maximize analgesia with minimal respir- tory depression.

References

1. Nielsen, C.H., et al., CO_2 Sensitivity after Epidural and I.V. Morphine. Anesthesiology 55:A372, 1981.