Is the Risk of Using a "Basal" Infusion with Patient-controlled Analgesia Therapy Justified?

To the Editor:—Patient-controlled analgesia (PCA) has become a widely accepted technique for managing postoperative pain following elective surgical procedures.1 Many of the modern computer-based PCA delivery systems have the capability of administering basal (background) infusions to supplement conventional PCA therapy.2 Although some studies have suggested that the use of a basal infusion might decrease the pain associated with physical activity and improve the quality of sleep,3-5 other studies have questioned the routine use of background infusions.6-8

In contrast to "on-demand" PCA therapy, the use of a continuous infusion obligates the patient to receive a minimum amount of opioid medication. While mistakes in programming on-demand therapy can result in an excessively large bolus dose being administered, the risk of a serious overdose is reduced because it is necessary that the patient activate the device in order for each bolus dose to be administered. The consequences of a mistake in programming a continuous infusion are potentially more serious because the opioid medication is administered without the patient having to activate the PCA device.

As suggested by McKenzie,9 whenever the continuous (or continuous plus PCA) infusion mode is used, "a danger of overdose is present." During a recent study involving the use of a nighttime basal infusion,9 a patient received a near-fatal overdose as a result of a human programming error at our institution. This 69-year-old woman received 10 times the prescribed dosage of morphine when the PCA device was misprogrammed after the battery expired during the early morning hours of the third postoperative day following a radical abdominal hysterectomy procedure. She received approximately 50 mg morphine over a 5-h period before she was found with bradypnea (one to two breaths per minute). She was resuscitated with naloxone 0.4 mg intravenously (twice), and tracheal intubation was performed to treat hypoxemia secondary to pulmonary aspiration. Her aspiration pneumonia required ventilatory support for 5 days in the intensive care unit. Following discharge from the intensive care unit, the patient experienced an uneventful recovery. The occurrence of mishaps due to human errors remains a serious concern with PCA therapy,9 particularly when using the continuous infusion modes available with the sophisticated, computer-based PCA delivery systems.9

Because only a small proportion of patients (≤ 5%) appear to benefit from the addition of a continuous infusion with PCA therapy after abdominal hysterectomy procedures,9 we question the routine use of this PCA modality in that patient population. Nevertheless, there are specific situations (e.g., patients who experience inadequate pain control with physical activity or at night) in which the continuous infusion mode may be useful. Prior to instituting a new mode of postoperative PCA therapy, carefully controlled studies should be performed to determine the risk-to-benefit ratio in the patient population receiving the analgesic therapy.

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REFERENCES


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