20. OPIOID-INDUCED PULMONARY EDEMA

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The most common drug-induced noncardiogenic pulmonary edema is produced by the opioid analgesics. Opioid-induced pulmonary edema is associated most commonly with IV heroin use but also has occurred with morphine, methadone, meperidine, and propoxyphene use. There have also been a few reported cases associated with the use of the opioid antagonist naloxone and nalmefene, a long-acting opioid antagonist. The mechanism is unknown but may be related to hypoxemia similar to the neurogenic pulmonary edema associated with cerebral tumors or trauma or a direct toxic effect on the alveolar capillary membrane. Initially thought to occur only with overdoses, most evidence now supports the theory that opioid-induced pulmonary edema is an idiosyncratic reaction to moderate as well as high opioid doses.

Patients with pulmonary edema may be comatose with depressed respirations or dyspnea and tachypnea. They may or may not have other signs of opioid overdose. Symptomatology varies from cough and mild crepitations on auscultation with characteristic radiologic findings to severe cyanosis and hypoxemia, even with supplemental oxygen. Symptoms may appear within minutes of IV administration but may take up to 2 hours to occur, particularly following oral methadone. Hemodynamic studies in the first 24 hours have demonstrated normal pulmonary capillary wedge pressures in the presence of pulmonary edema.

Clinical symptoms generally improve within 24 to 48 hours, and radiologic clearing occurs in 2 to 5 days, but abnormalities in pulmonary function tests may persist for 10 to 12 weeks. Therapy consists of naloxone administration, supplemental oxygen, and ventilatory support if required. Mortality is less than 1%.

Cough has been reported with IV administration of fentanyl in adult and pediatric population. A cohort of 1,311 adult patients undergoing elective surgery had 120 patients with vigorous cough within 20 seconds after administration of fentanyl. The cough was associated with young age and absence of cigarette smoking. Among anesthetic factors, it was associated with the absence of epidurally administered lidocaine and the absence of a priming dose of vecuronium. A history of asthma or COPD had no predictive effect. Further clinical trials are required to understand the mechanism of paradoxical cough with fentanyl and to identify the means to prevent it.

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