Catecholamine Surge in Opioid-addicted Patients Undergoing Detoxification under General Anesthesia

To the Editor—We read with interest the article by Kienbaum et al.1 regarding the hypothesis that μ-opioid receptor blockade by naloxone induces cardiovascular stimulation mediated by the sympathetic adrenal system.

This study confirms that clinicians who have detoxified heroin addicts for 20 yr have known, i.e., clonidine, an α2-agonist, is essential to avoiding hyperadrenergic crisis and pulmonary edema. Riordan and Kleber2 in 1980 first demonstrated that utility of clonidine in controlling the hemodynamic changes seen in the withdrawal syndrome. Naloxone has also been previously associated with pulmonary edema3 presently because of this sympathoadrenal surge.

It is very dramatic to document the extent of catecholamine secretion. This has been elegantly demonstrated in the study by Kienbaum et al.1 We also agree with the authors that because of this cardiovascular stimulation secondary to a surge in sympathoadrenal system, the procedure of acute opioid detoxification should be done by trained anesthesiologists in an intensive care setting. However, in order to make this procedure safe, it is imperative to use an α2-agonist, such as clonidine before μ-opioid receptor blockade, even if the patient is under general anesthesia.

Clifford Gevirtz, M.D.
Associate Professor
Dilip V. Subhedar, M.D.
Assistant Professor

References

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Peter Kienbaum, M.D.
Research Fellow and Resident
Jürgen Peters, M.D.
Professor of Anesthesiology and Intensive Care Therapy and Chairman
Abteilung für Anästhesiologie und Intensivmedizin
Universitätsklinikum GH Essen
Essen, Germany
peter.kienbaum@uni-essen.de

In Reply.—We appreciate the interest of Drs. Gevirtz, Subhedar, and Choi in our recent publication.

On the clinical side, consistent with our experience, clonidine reduces withdrawal symptoms during detoxification. Accordingly, it has been favorably administered during detoxification from opioids in awake addicts for more than 20 yr. However, it has been claimed by psychiatrists that cardiovascular responses and withdrawal symptoms to detoxification from opioids both can be minimized by administration of large amounts of μ-opioid receptor antagonists alone when administered during sedation or general anesthesia.

In our study, we had to reject this hypothesis by demonstrating extensive increases in catecholamine concentrations in plasma and cardiovascular stimulation associated with μ-opioid receptor blockade by naloxone during general anesthesia. Furthermore, the need for additional drugs such as α2-adrenergic agonists, e.g., clonidine, was described.

We pointed attention to the fact that (1) marked sympathoadrenal activation and cardiovascular stimulation may be observed during detoxification from opioids by administration of μ-opioid receptor antagonists alone, despite deep general anesthesia, and (2) the need for trained anesthesiologists/intensivists in performing this treatment, as also proposed by Dr. Gevirtz and coworkers. Whether and why clonidine helps in minimizing cardiovascular and sympathoadrenal stimulation during detoxification even during conditions of general anesthesia is the subject of ongoing investigation.