diagnosis, the activity of lymphocyte coproporphyrinogen oxidase may be determined. The test, which is accurate and reliable, is being conducted in a few porphyria reference laboratories. Both tests are used to establish a diagnosis also in the latent phase and may therefore be performed in the patient after recovery.

We suggest that the patient be checked by a reference laboratory authorized for the biochemical diagnosis of porphyria before any conclusion concerning the use of propofol in porphyric patients is drawn.

In addition, we would like to point out a few mistakes in the report of the biochemical findings in the urine: aminolevulinic acid and porphobilinogen are not porphyrins but precursors in the porphyrin biosynthetic pathway; the excretion of aminolevulinic acid and porphobilinogen is determined in micromoles per 24 h and that of porphyrins in nanomoles per 24 h, not in millimoles as reported in the article.

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References


Recovery after Discontinuation of Cardiopulmonary Resuscitation ("Lazarus Phenomenon")

To the Editor.—The case report by Frolich is one of the best documented cases of spontaneous recovery after discontinuation of cardiopulmonary resuscitation (CPR). More than 25 such cases have been reported, including at least eight patients discharged neurologically intact. One case published in Anesthesiology introduced the term "Lazarus phenomenon" for such events. However, we would argue...
that the case of Harden et al.\textsuperscript{4} should not be regarded as a true Lazarus phenomenon because there is no indication that CPR had been stopped at the time when spontaneous conversion of ventricular fibrillation occurred.

With regard to prevention of Lazarus phenomena, Frölich suggests to continue CPR until ineffectiveness has been shown by a decreasing pH with adequate ventilation.\textsuperscript{5} Although this approach is probably correct, there are no defined pH values below which resuscitation can be considered futile. In the case of Fumeaux et al.,\textsuperscript{3} the patient survived neurologically intact after cessation of CPR at a pH of 6.54. An alternative approach might be end-tidal carbon dioxide. Its use for therapeutic and prognostic decisions during CPR was first proposed by Eisenmenger,\textsuperscript{6,7} first used in humans by Leigh et al.,\textsuperscript{8} and studied in detail by Smalhout.\textsuperscript{9} In the last 20 years there have been several studies on capnography during CPR.\textsuperscript{10} Values greater than 10-15 mmHg indicate a favorable prognosis and should preclude termination of CPR. Unfortunately, there are no capnography data in the Lazarus cases published to date, including ours and that of Frölich.\textsuperscript{1,2}

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References


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To the Editor—We read with interest the case report from Dr. Frölich on spontaneous recovery after discontinuation of cardiopulmonary resuscitation (CPR).\textsuperscript{1} This rare and unsettling occurrence was also observed recently in our intensive care unit, although the postulated etiology differs from the published case.

A 76-yr-old man with severe bullous chronic obstructive pulmonary disease had been admitted in extremis requiring urgent intubation and ventilation. Within minutes he had suffered cardiac arrest from which he was resuscitated, although with evidence of residual hypoxic encephalopathy. He was resistant to attempts to wean him from mechanical ventilatory support. On the eighth day, while the patient was undergoing synchronized intermittent mandatory ventilation with pressure support, it was noted that the ventilator pressures were fluctuating widely, although delivered tidal volume was constant. He rapidly developed a profound bradycardia and increasing cyanosis. The ventilator was disconnected and manual ventilation with a self-inflating bag and chest compressions were started. In response to 0.6 mg atropine and 1 mg epinephrine, he developed a ventricular tachycardia that progressed to ventricular fibrillation. Direct current defibrillation led to a wide complex rhythm that progressed to asystole despite further pharmacologic intervention (including additional epinephrine, dopamine, bicarbonate, and lignocaine). It was noted throughout that ventilatory compliance was poor, although there was bilateral air entry; the trachea was central, and the ready suction catheter suggested tube patency was not compromised. An arterial blood gas analysis during CPR showed pH 6.92, PaO\textsubscript{2} 117 mmHg, PaCO\textsubscript{2} 327 mmHg, and base excess -10 m.

After 30 min of CPR with no evidence of spontaneous circulation and asystole in all electrocardiogram leads, resuscitative efforts were discontinued. The endotracheal tube was removed, and examination of it showed nothing untoward; the electrocardiogram remained connected. After 5 min return of cardiac electrical activity was noted, which progressed to sinus tachycardia accompanied by good volume pulses and spontaneous respiratory effort.

Arterial blood gas analysis shortly thereafter, with the patient breathing spontaneously with PaO\textsubscript{2} 0.24, showed pH 7.19, PaO\textsubscript{2} 64 mmHg, PaCO\textsubscript{2} 82 mmHg, and base excess -9 m.

With regard to prevention of Lazarus phenomena, Frölich suggests to continue CPR until ineffectiveness has been shown by a decreasing pH with adequate ventilation. Although this approach is probably correct, there are no defined pH values below which resuscitation can be considered futile. In the case of Fumeaux et al.,\textsuperscript{3} the patient survived neurologically intact after cessation of CPR at a pH of 6.54. An alternative approach might be end-tidal carbon dioxide. Its use for therapeutic and prognostic decisions during CPR was first proposed by Eisenmenger,\textsuperscript{6,7} first used in humans by Leigh et al.,\textsuperscript{8} and studied in detail by Smalhout.\textsuperscript{9} In the last 20 years there have been several studies on capnography during CPR.\textsuperscript{10} Values greater than 10-15 mmHg indicate a favorable prognosis and should preclude termination of CPR. Unfortunately, there are no capnography data in the Lazarus cases published to date, including ours and that of Frölich.\textsuperscript{1,2}