

Non-invasive ventilation (NIV) using a compact CPAP system for the treatment of postoperative hypoxaemia in the PACU

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Question: Does the application of miniaturised CPAP systems in the Post-Anaesthesia Care Unit (PACU) lead to a more rapid improvement of postoperative hypoxaemia, to an earlier transfer of the patient to the ward, and to a reduced incidence of postoperative complications when compared to conventional O₂ mask therapy?

Methods: 206 patients who had undergone elective surgery and who had postoperative SpO₂ levels < 93% upon arrival in the PACU were treated with 1-hour oxygen inhalation either using conventional oxygen masks (month 1) or EzPAP (month 2). An oxygen-free phase of 30 minutes, during which patients were breathing ambient air, followed this treatment. The progression of SpO₂, haemodynamics, tolerability etc. was documented in accordance with the PACU protocol. 3 months after surgery, hospital stay and complications were determined with the help of medical controlling procedures.

Results: After 0.5 minutes, the EzPAP group showed a significantly more rapid increase of SpO₂ levels ($p < 0.05$) and significantly higher saturation levels at the end of the oxygen-free phase ($p = 0.03$; $94.6 \pm 2.3\%$ vs. $93.4 \pm 4.5\%$) and at the time of discharge from the PACU ($p < 0.05$; $94.8 \pm 2.2\%$ vs. $93.7 \pm 2.2\%$). After 24 hours, no significant difference between both treatment groups was found anymore. However, SpO₂ values were significantly higher at that time ($p = 0.01$; $96.2 \pm 1.0\%$ vs. $94.5 \pm 1.0\%$) in the EzPAP-subgroup of patients with BMI levels > 40. 3 months after intervention, patients who had been treated with EzPAP showed a significantly lower rate of general postoperative complications ($p = 0.02$) and of postoperative pneumonia ($p = 0.03$). Mean hospital stay was 10.7 days in the EzPAP group and 14 days in the control group ($p = 0.1$).

Conclusion: Generally, the application of CPAP in the PACU using miniaturised systems has been well accepted and tolerated. There is a potential for earlier patient discharge from the PACU. It was possible to demonstrate a significant reduction of postoperative pulmonary and wound infections.