Nitrous oxide for wound care analgesia (002)

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Background: Nitrous oxide (N₂O) is a drug that has been used for more than 160 years. In general anaesthesia the use of N₂O has decreased, but at the same time the interest for N₂O as an analgesic during short painful procedures is increasing. Several studies have demonstrated high safety and good patient satisfaction. In burn patients N₂O is an option for wound care analgesia. In patients with major burns, in need of repeated, long-lasting wound care N₂O is not suitable due to its neurological and hematological side effects, especially in malnourished patients.

Material and methods: In the Burn Centre, Uppsala, N₂O (Livopan®, 50% N₂O/50% O₂, AGA Gas, Lidingö, Sweden) has been used in the outpatient setting since April 2013. Patients, children > 4 years of age and adults, without contraindications, have been offered treatment with N₂O during wound care lasting no longer than 60 minutes. 180 treatments with N₂O have been administrated to 102 patients. Patients/relatives, treating nurse, and doctor have evaluated the treatment using a printed questionnaire. Mean burn surface area was 2.7%, range 0.5 - 20%.

Safety: Livopan® has been administrated by nurses with special training in N₂O administration. All patients have been monitored for SpO₂, ECG, and blood pressure during and after the procedure. An anaesthetist was always available during the treatment.

All patients have been given acetaminophen (15 mg/kg) prior to the treatment. Additional analgesia, oxycodone and/or ibuprophen, was given ad lib.

Results: Questionnaires from 102 patients (180 treatments) were collected, from patients/parents, nurses and, surgeons. 85 patients (83.3%) were positive to receive nitrous oxide again. Pain assessment (0-10) showed a median value of 7 as worst pain, and 2 after the procedure. Apart from acetaminophen, additional opioids were given in 52 cases (28.4%) and ibuprophen in 35 cases (19.1%). In 117 (65 %) of the treatments side effects were experienced, most common was sleepiness (36.7%), euphoria (33.3%) and vertigo (20.5 %). Of note is that only 11 cases (6.1 %) of nausea and 6 cases (3.3 %) of vomiting were observed. No serious side effects like hypoxemia or circulatory failure occurred.

Conclusion: Nitrous oxide in outpatients with minor burns has several advantages; it is safe, patient satisfaction is high, recovery is fast, and side effects are few and harmless. Additional analgesia is necessary in many cases since nitrous oxide is not always sufficient during the procedure.