

The aim of the study was to evaluate efficacy of NIV in AE/OHS and to identify factors associated with poor prognosis in non-invasive-ventilated AE/OHS patients.

Patients and methods A retrospective analysis of all consecutive patients admitted to ICU for AE/OHS. Clinical, ABG's and outcome characteristics were collected. Factors associated with poor prognosis were identified.

Results One hundred patients were included over a 13 years period. 44 patients underwent NIV. They were 66.6 ± 12.6 years aged; BMI, 40.6 ± 7.7 kg/m²; SAPSII, 29 ± 13 ; pH, 7.33 ± 0.08 ; pCO₂, 69 ± 22 mmHg. They were scored with grade II encephalopathy score on admission. Mean duration of NIV was 5.1 ± 4.4 days. 14 (32%) patients failed NIV and were intubated with a delay of 85.6 ± 156.7 h. 11 (25%) died and length of stay was 10.7 ± 9.5 days. Four factors were significantly associated with mortality, mMRC, (47 vs 14%; $p = 0.02$); encephalopathy score, (60 vs 15%; $p = 0.008$); NIV failure, (64 vs 7%; $p = 0.0001$); inotropic agents, (58 vs 12.5%; $p = 0.004$).

Conclusion NIV in AE/OHS demonstrates rather efficient. However delay of intubation seems to be of poor prognostic value.

Competing interests

None.

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Oxygenotherapy with an oxygen concentrator in intensive care unit: a prospective study

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Introduction Oxygen therapy is an essential issue for the French Military Health Service (FMHS). Wounded soldiers are severe trauma patients often burnt and suffering from haemorrhagic shock. They need all along their management oxygen therapy. The theatres of external operations are isolated with limited resources. Their supply is difficult. Currently, 50% of the trauma are intubated. Thirty-three percent of the patient admitted in intensive care suffers from acute respiratory distress syndrome (ARDS). The FMHS chose oxygen concentrator as oxygen source in addition to oxygen pressurized bottles. Their supply can be uncertain in conflict areas. Insufficient data are available concerning the use of oxygen concentrator in intensive care unit.

The primary endpoint was to determine over the total duration of oxygen therapy, the number of days on which the use of pressurized oxygen was needed for patients oxygenated by oxygen concentrator. The secondary endpoints were to identify when pressurized oxygen was needed, describe the characteristics of the population with oxygen therapy and estimate the oxygen quantity economised thanks to the use of oxygen concentrator.

Materials and methods The study took place in the forward surgical unit of Bouffard. It's a French role 3 located in Djibouti Republic in Africa. All patients over 15 admitted in the intensive care and needing oxygen therapy were included. All the patients were oxygenated with an oxygen concentrator. The oxygen concentrators used were Sequaltm Integra 10 OM, that could deliver up to 10 l/min of normobaric oxygen. The ventilator used were Pulmonetictm LTV 1000 and 1200.

Results Thirty-six patients were included over the 6 months' study period. Sixty percent of the patients were men with an average age of 38 (15–90). Sixty percent of them were medical admissions, 22.9% were trauma and 17.1% were surgical admissions. Eight persons died which represented 22.9% of the patients. The mean SAPS II was 38.8. The mean length of stay in intensive care was 9 days (0–44). The mean time of mechanical ventilation was 6 (1–35) days. Among the patients, 76.5% were intubated. Eight patients (22.8%) needed noninvasive ventilation, for six (17%) of them it was after extubation. Two hundred and fifty-one days represents the total number of

days of oxygen therapy divided into 142 days of invasive ventilation, 15 days of noninvasive ventilation and 94 days of oxygen mask. The use of pressurized oxygen was necessary 19 times over the 251 days of oxygen therapy which represents 7.5% of the total time. The causes of its use were in ten cases (52.6%) criteria of severe ARDS, in six cases an emergency intubation and in three cases a transfer. One dysfunction of an oxygen concentrator happened during our study. The oxygen concentrator produced 1024 m3 of oxygen over the study period, which represents 104 oxygen pressurized bottles of 50 litres. This enabled an economy of 10,000 euros.

Conclusion It is safe to use oxygen concentrator to take care of critically ill patients in limited resources environment. The use of pressurized oxygen is still compulsory in two situations: in case of electricity failure and in case of high FiO₂ (above 60%). Oxygen concentrators are sufficient in 92.5% of the time. They enable to deliver oxygen any time which is essential when supply is uncertain in conflict areas.

Competing interests

None.

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Evaluation of fractional delivered oxygen between nasal cannula and nasal oxygen catheter

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Introduction Oxygen therapy is the main supportive treatment of hypoxia. Nasal cannula (NC) and nasal oxygen catheter (NOC) were used to administer oxygen therapy in hypoxia. Few studies have examined the difference in fractional delivered oxygen (FDO2) between these two systems. The aim of our study was to compare the difference of FDO2 between NC and NOC.

Materials and methods On a bench study, a two-compartment model of adult lung (Dual Test Lung DTL, Michigan Instrument) was connected to a Servo i[®] Ventilator. The ventilator was set in volume-controlled mode. Three minute ventilation (MV: 6/9/12 l/min at Ti/Ttot = 0.33) and two oxygen flow rate (OFR: 2 and 4 l/min) were analyzed. OFR was analyzed with a thermal mass flow meter VogtlynTM Red Y. The compliance of the artificial lung was set to 70 ml/cmH₂O and the resistance set to 5 cmH₂O/l s⁻¹. The FDO2 and MV measurements were made using an iWorx[®] acquisition system (GA207gas analyzer and analog/digital IX/228 s) and LabScribe II[®] software. To simulate the anatomic dead space of the nasopharynx (±50 ml for an adult) we have used a 15 cm length corrugated tubing ISO 22 mm (CT22) at the level of inflow of DTL. NC was introduced at the entry of the CT22 while the NOC was introduced totally into the CT22. Statistical: ANOVA on ranks followed by Student–Newman–Keuls.

Results

Conclusion In oxygen therapy, with NC or NOC, for a Ti/Ttot = 0.33, FDO2 is influenced by MV, OFR and oxygen system delivery. For the same level of OFR and system delivery, when MV increases, FDO2 decreases (see Table 4). For the same MV and level of OFR, FDO2 was

Table 4 FDO2 comparison between NC and NOC at different OFR and MV

VE(L/min)	NC2 L/min	NOC2 L/min	NC 4 L/min	NOC4 L/min
6	31% (0.5)	37% (0.5)	38% (0.6)	43% (0.5)
9	29% (0.7)	34% (0.6)	34% (0.5)	39% (0.7)
12	26% (0.6)	30% (0.6)	30% (0.7)	34% (0.5)

ANOVA on ranks: $p < 0.05$, except between: NOC2 (VE 9 L/min) and NOC4 (VE12 L/min)/NC2 (VE 9 L/min) and NOC2 (VE12 L/min)/NOC2 (VE12 L/min) and NC4 (VE12 L/min)/NC4 (VE 9 L/min) and NOC4 (VE 9 L/min)/NOC2 (VE 9 L/min) and NC4 (VE 9 L/min)