EAHP 29th Congress

IMPACT OF EXTRACORPOREAL MEMBRANE OXYGENATION CIRCUIT ON FENTANYL PHARMACOKINETICS IN CRITICALLY ILL PATIENTS

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Background and importance

Fentanyl's lipophilicity and protein binding may contribute to a sequestration of the drug in the extracorporeal membrane oxygenation (**ECMO**) circuit, which could **impact to pharmacokinetic** and **response** in **critically ill** patient

Aim and objectives

To assess the **impact of ECMO circuit** on the plasma concentration (**Pk**) **of fentanyl** in critically ill patients

Material and methods

Observational, prospective, multidisciplinary, cohort study

variables

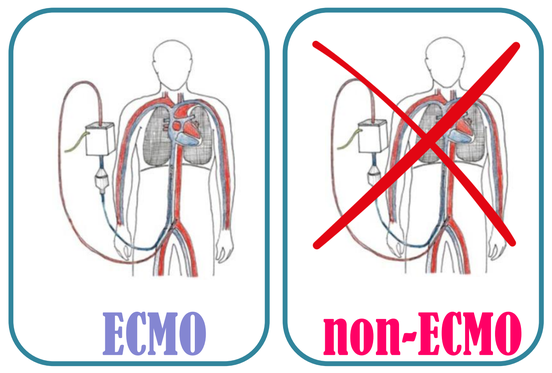
Demographic
Age
Sex
BMI

Therapeutic
Dose and duration
Sedative concomitant drug
CYP3A4 inducer-inhibitor

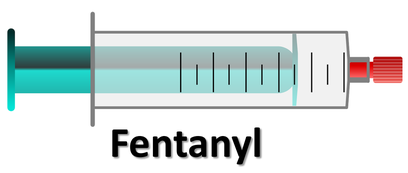
Clinical
Diagnosis and comorbidities
SAPS3 score
CRRT and Mechanical ventilation (MV)
Clinical parameters (at 0, 24, 48h)
- BP, HR, RR
Analitical parameters (at 0, 24, 48h)
- renal, hepatic, INR, protein, albumin

Adverse events
Respiratory depression
Bradycardia
Hypotension
CNS depression
Constipation, ileus

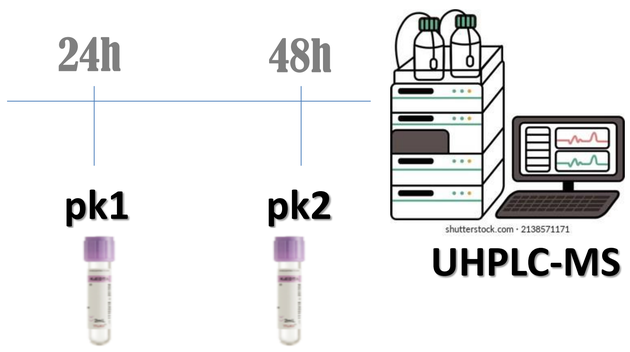
Adult critically ill patients



pK



Fentanyl
900mcg/100mL SSF 0,9%
continuous perfusion > 48h

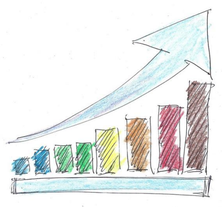


UHPLC-MS

Jan 2021-Dec 2022

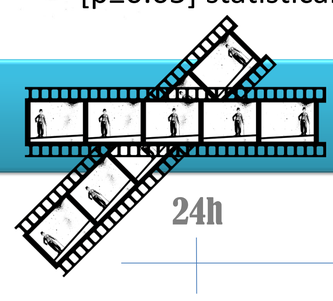
pD

ESCID scale, BIS / RASS score, CAM-ICU score



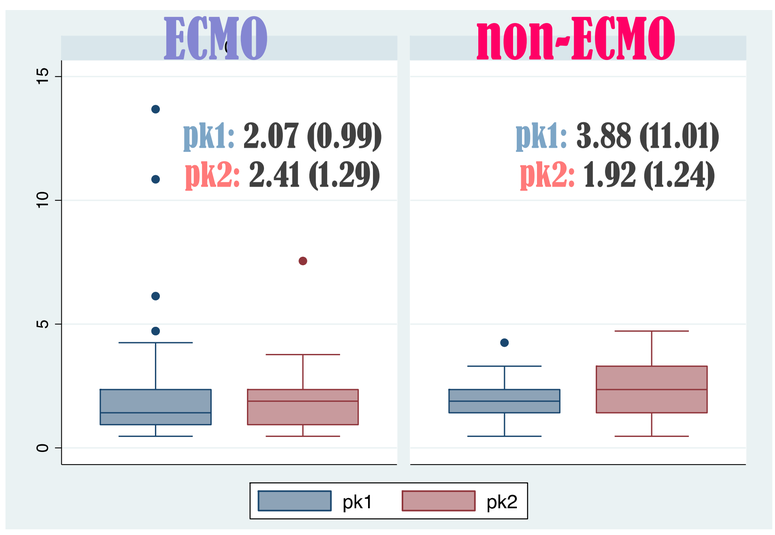
STATA v.14.2
mean (SD) / median (IQR)
Student´s t-test/Mann-Whitney test
absolute (relative) frequency
Pearson´s chi-squared /Fisher´s exact test
[p≤0.05] statistically significant

Results



n= 76 patients

	ECMO n=13	non-ECMO n=63	p
Age	48.68 (13.69)	56.90 (13.16)	0.045
Male	13 (100)	34 (65.01)	0.015
BMI	27.68 (4.65)	27.77 (6.20)	0.961
SAPS3	57.69 (5.01)	58.76 (14.55)	0.795
MV	12 (92.31)	56 (88.89)	0.715
CRRT	1 (7.70)	3 (4.76)	0.667



p=0.557 p=0.261

	24h	48h
mcg/Kg/min	0.64 (0.50) 0.52 (0.25) p=0.212	0.41 (0.16) 0.49 (0.30) p=0.444
ESCID score	0 (0-3) 0 (0-5) p=0.463	0 (0-3) 0 (0-4) p=0.774

No statistically significant differences

Drug interaction
Concomitant treatment
Adverse events

Conclusion and relevance

In our serie the use of **ECMO** had **no significant impact** on **fentanyl Pk** during the **first 48h**. Using a **standard perfusion** in patients on extracorporeal support to dose according to **the response** guided by the **ESCID** scale is **safe** to achieve **adequate pain control**.