

DONARE Study – adsorption of inflammatory mediators during in-situ normothermic regional perfusion in controlled DCD organ donors

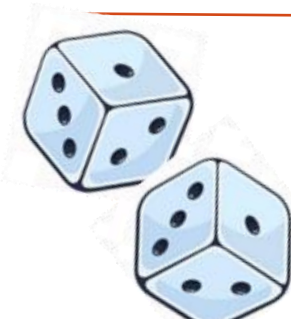
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Background

During all the steps of cDCD, organ Ischemia-reperfusion injury (IRI) is driven by production and accumulation of inflammatory mediators. In the Italian scenario, IRI can be exacerbated by the mandatory prolonged warm ischemia time associated to 20 minutes of no touch period. A randomized study was performed to describe the inflammatory cytokines trend during abdominal nRP in potential cDCDs and the effect of a sorbent included in the nRP circuit.

Methods



Randomized study of 40 cDCDs in 1:1 ratio:
nRP+CytoSorb group vs nRP group

40 cDCD DONORS

20 CONTROL GROUP NRP without CytoSorb

SAMPLE PORTS

P1 – venous line

P2 – post oxygenator

20 INTERVENTION GROUP NRP with CytoSorb

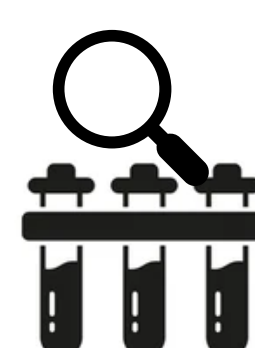
SAMPLE PORTS

P1 – venous line

P2 – pre adsorber

P3 – post adsorber

P4 – pre oxygenator



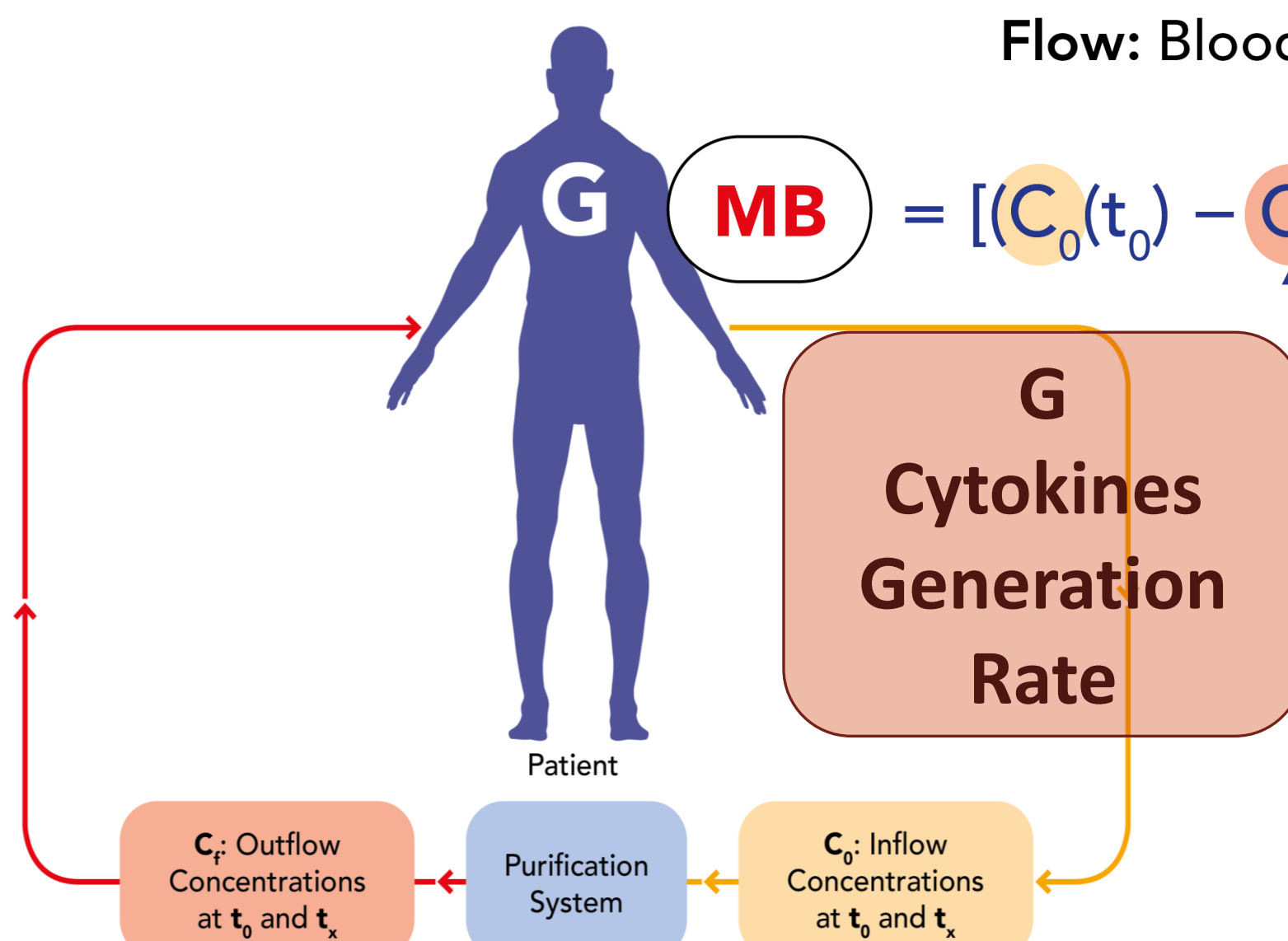
From t0 to tend hourly sampling Hemodynamics,
Metabolics IL-6, IL-8, IL-10, IL-1b, TNF-a quantification

MASS BALANCE DETERMINATION:

The Total Amount of Target IL removed from
perfusate between t₀ and t_x

Observations in a timeframe between t₀ and t_x
Flow: Blood or Plasma Flow Rate in the system

$$MB = [(C_0(t_0) - C_f(t_0)) + (C_0(t_x) - C_f(t_x))] / 2 * \text{Flow} * \text{time [mg]}$$



Results

Extremely High Cytokines Levels

Amount of Cytokines Adsorbed on average per treatment

Adsorbed (pg)	MB IL-6	MB IL-8	MB IL-10	MB IL-1b	MB TNF-a
	8.116.941,64	1.661.684,59	2.795.689,19	3.436,78	2.127.372,34

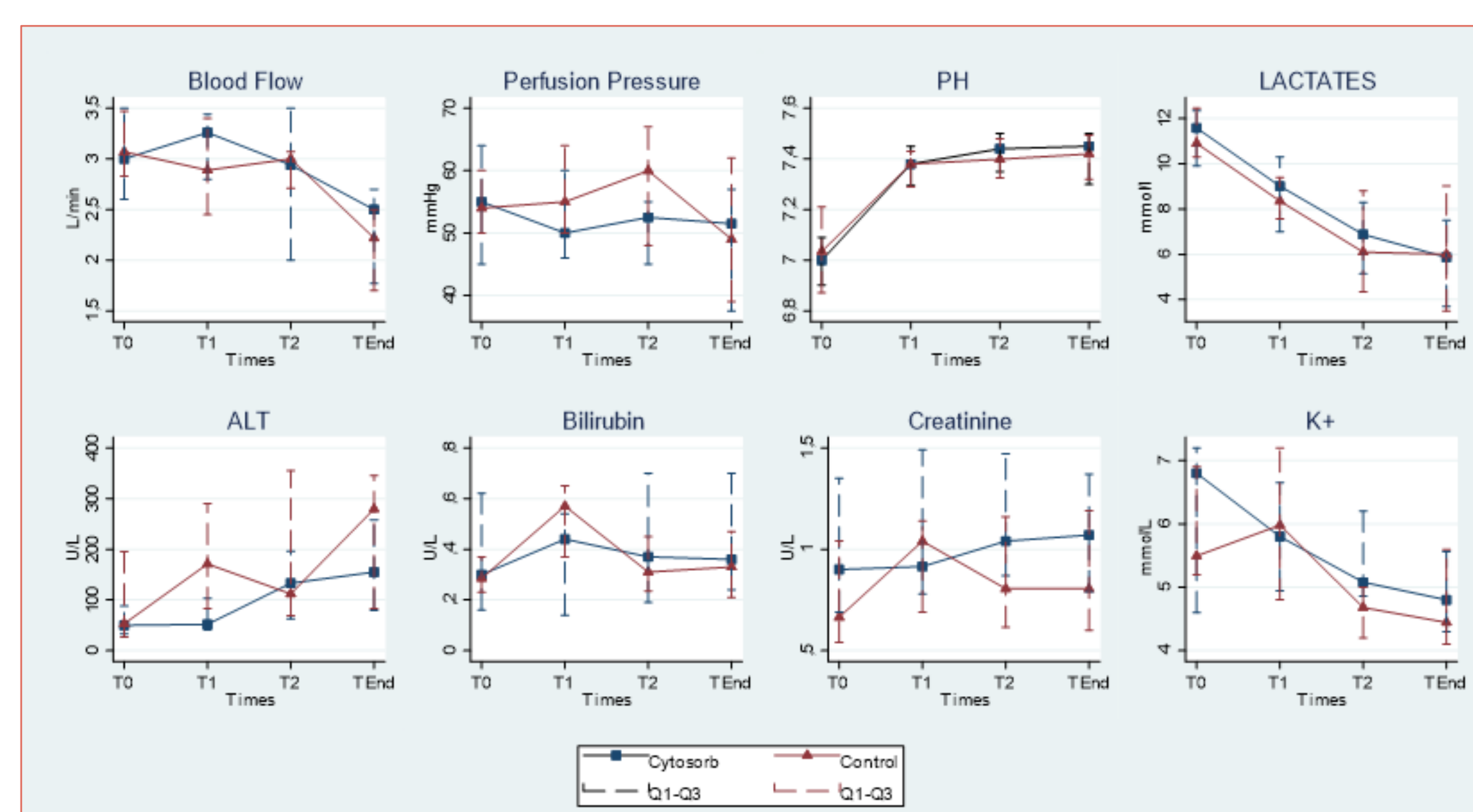
$$\text{Adsorbed} = ((C_{pre} - C_{post}) * \text{flow} * \Delta t)$$

C_{pre}/C_{post}= mean concentration of the target molecule between tx and tx+1 at CytoSorb Inflow/Outflow

Δt= Time duration between timepoints: tx and tx+1

Flow = Plasma Flow through CytoSorb = Q_{CytoSorb} × (1-hematocrit)

Q_{CytoSorb}= Blood Flow through CytoSorb



Lactates, pH, ALT, bilirubin, and creatinine
were not different between the groups

Cytokine Adsorption is **safe** and **potentially useful**, removing high quantity of inflammatory mediators ...



... **larger experience is needed** for establishing its routinely use in cDCD, even sequentially,
during in-situ NRP and ex-situ organ perfusion and its impact on the organ outcome

