Finding the 'safe' cerebral perfusion pressure (CPP) zone in childhood brain trauma: A KidsBrainIT data-driven project

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BACKGROUND:

- Cerebral perfusion pressure (CPP) dose-response on outcome following paediatric traumatic brain injury (TBI) remains unknown.

AIM:

- We aim to produce the first paediatric TBI CPP dose-response visualisation plot to define a 'safe' CPP zone.

This CPP Dose-response Paper

METHODS:

- A prospective international multi-centre observational study
- 104 paediatric TBI patients, aged 2 to <16 years-old recruited in KidsBrainIT consortium (Figure 1).
- Cerebral perfusion pressure (CPP) to define insult-intensity episodes; correlated with 6-months outcome to plot 3D colour coded CPP dose-response plots (Figure 2).

Figure 1: KidsBrainIT Consortium
(17 PICU 7 Countries)

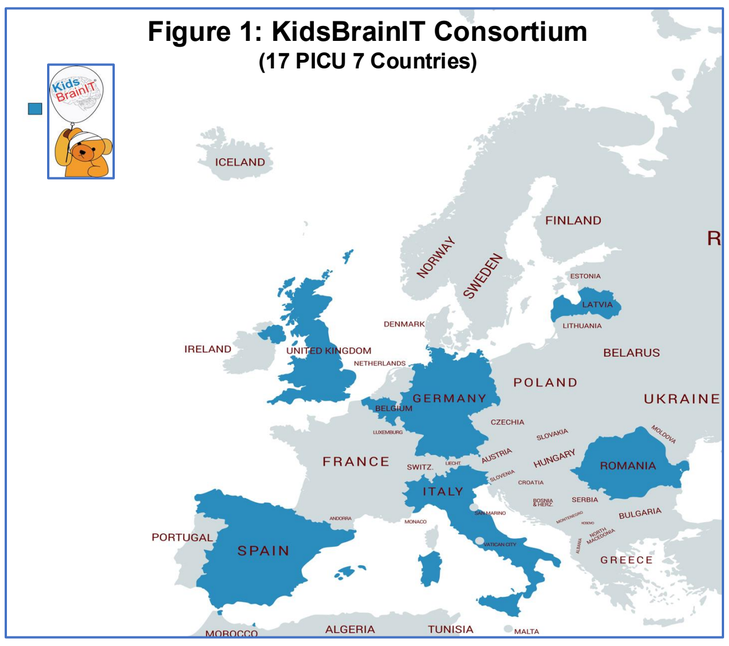
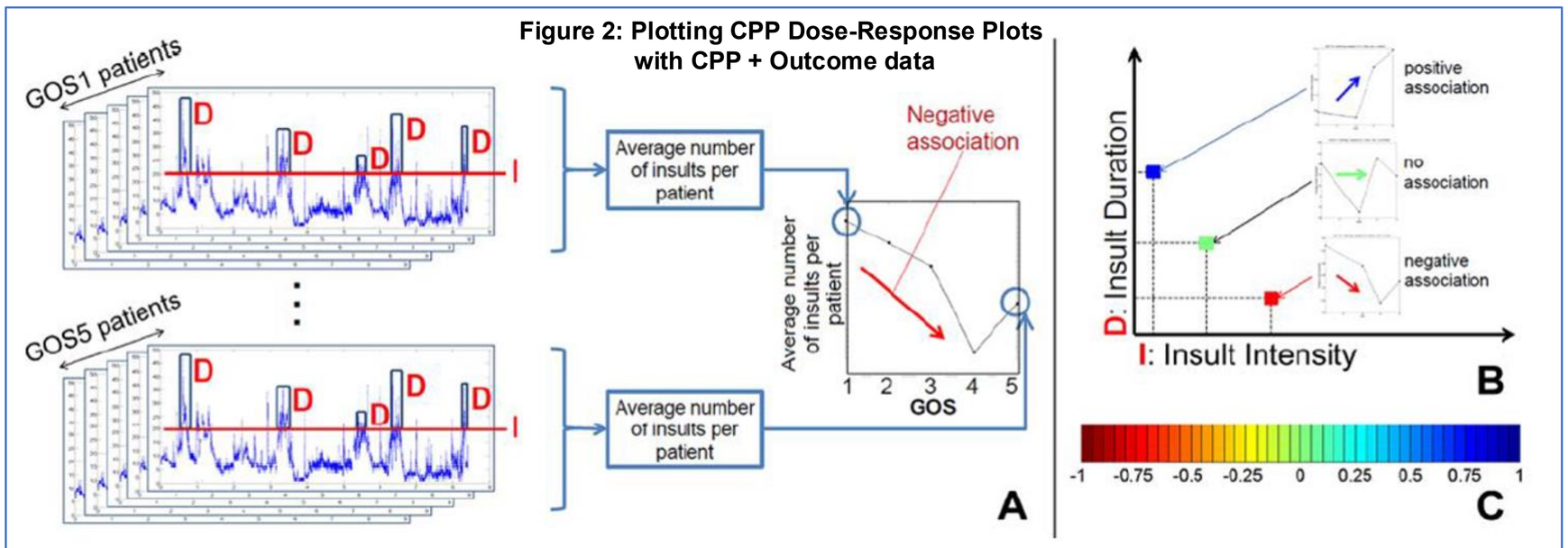
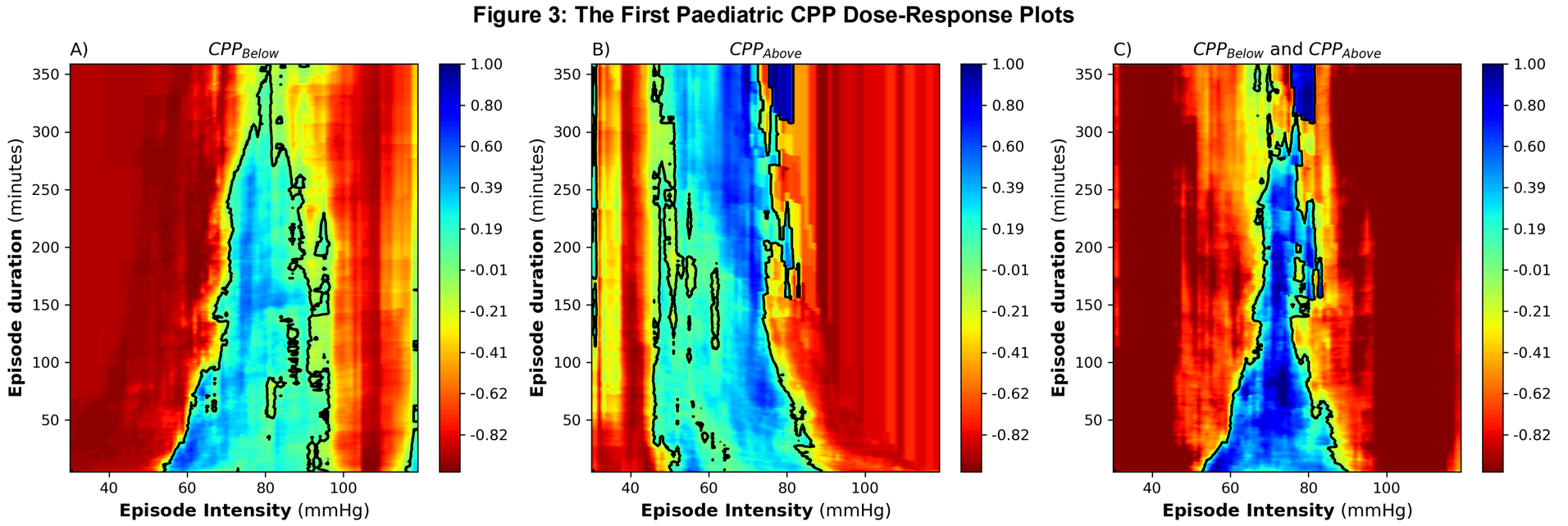


Figure 2: Plotting CPP Dose-Response Plots with CPP + Outcome data



RESULTS:

Figure 3: The First Paediatric CPP Dose-Response Plots



- Lower and higher ends of CPP intensity were only tolerated for shorter durations.
- A 'safe' CPP zone was identified for paediatric TBI with active CVR pattern.

CONCLUSIONS:

- The paediatric CPP dose-response on poor outcome was visualised successfully for the first time defining a 'safe' CPP zone.
- The identified 'critical' lower CPP limit exceeded the current recommended minimum CPP target and warrants urgent validation in an independent cohort to provide evidence-based future CPP clinical targets.

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