TEA POLYPHENOLS ALLEVIATE OXIDANT INJURY FOLLOWING CPR IN AN ASPHYXIA RAT MODEL

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Background Cerebral ischemia/reperfusion injury following cardiac arrest and cardiopulmonary resuscitation (CPR) have been demonstrated. Oxidant injury plays a critical role in the process. We have reported that tea polyphenols from green tea improved the survival time and neurological deficit score of CPR in an asphyxia rat model. However, whether it acts via preventing the oxidising reaction by its phenolic hydroxyl group combined of oxygen free radicals and lipid peroxides in this model remains unknown. Therefore, we hypothesised that tea polyphenols would counteract the oxidant injury.

Methods Male Sprague–Dawley rats, weighing 200–400 g, were induced cardiac arrest by clamping the tracheal tubes. At the end of 8 min of clamping, mechanical chest compression at a rate of 180/min was performed. Ventilation was started with room air at 70 breaths per min and tidal volume adjusted to 6 ml. Epinephrine was administered at 1 min of CPR. Animals were randomly treated with either saline (n=52, Sal-gro) or 10mg/kg tea polyphenols (n=24, TP-gro) following ROSC. Animals in the sham control group (n=15, Con-gro) were only treated with anesthesia, and underwent surgical operation. Each group was divided into 3 groups according to the 12h, 24h, 48h points with five rats respectively. The changes of Superoxide Dismutase (SOD), Malondialdehyde (MDA) in serum were assayed.

Results There were no significant differences in regard to hemodynamics among three groups before asphyxia. Time from the initiation of asphyxia to cardiac arrest and the duration of CPR were not significant among the groups. However, SOD of serum at 12h, 24h, 48 h following ROSC was significantly higher in TP-gro than in sal-group (p<0.05), the level of serum MDA at each point following ROSC was significantly lower in TP-gro than in that of sal-gro (p<0.05).

Conclusion Tea polyphenols alleviated oxidant injury following CPR in an asphyxial rat model.