OP45-5 Lethal Arrhythmogenetic Property in Hemorrhagic Shock Heart: Optical Mapping Analysis

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Irreversible heart dysfunction despite restoring circulation is called “Shock Syndrome”, caused by prolonged low mean systemic blood pressure (BP) < 40 mmHg, and this heart dysfunction frequently associates with lethal arrhythmias leading to adverse prognosis in the hemorrhagic shock patients. To investigate the mechanism of lethal arrhythmogenetic property in hemorrhagic shock heart, we performed optical mapping analysis (OM) and electrophysiological study (EPS) in rat's heart obtained from 30% hemorrhagic shock model with repetitive bleedings, where sustained lower mean BP < 40 mmHg was kept for more than 30 min. Hemorrhagic shock was induced in Sprague-Dawley rats (n=24). Rats were resuscitated by washed red blood cell (wRBC), normal saline (NS) and 5% albumin (5%alb). Hearts were excised, perfused with Tyrode solution and stained with fluorescent dye. Ventricular fibrillation (VF) was induced by burst pacing stimulus to multiple sites in the left ventricle (LV) and OM was performed. VF was induced in all rats resuscitated by NS and 5%alb and their OM showed conduction delay in LV. However, all rats rescued by wRBC had normal OM findings and no VF was induced. **Conclusions:** WRBC can improve deteriorated conduction in LV of hemorrhagic shock heart and prevent lethal arrhythmias. Conduction disturbance could be one of possible mechanisms in arrhythmogenesis of “Shock Syndrome”.

**Keywords:** shock heart, ventricular fibrillation, optical mapping