

Category : **Cardiovascular: cardiac arrest\CPR**

A73 - The use of 100% oxygen during non-effective cardiopulmonary resuscitation improves brain oxygenation compared to 50% oxygen

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Introduction:

Guidelines recommend 100% oxygen during cardiopulmonary resuscitation (CPR) but studies show that during effective mechanical chest compressions 50% oxygen may result in comparable brain oxygen levels [1]. Lower FiO₂ might reduce reperfusion injury but could cause hypoxia during poor quality CPR. We compared 100% and 50% oxygen during poor quality manual chest compressions.

Methods:

After Finnish National Animal Experiment Board (ESAVI/15067/2018, ESAVI/35183/2019) approval, ventricular fibrillation (VF) was induced electrically in anaesthetized pigs and left untreated for 5 minutes, followed by randomization to poor quality chest compressions with manual ventilation with 50% or 100% oxygen. Defibrillation was performed at 10 minutes and CPR continued with mechanical chest compressions (LUCASTM) and defibrillation every 2 minutes until 36 minutes or ROSC. Cerebral oxygenation was measured with near-infrared spectroscopy (rSO₂) and invasive brain tissue oxygen (PbO₂). Cerebral oxygenation was compared between groups with Mann-Whitney *U* tests.

Results:

Twenty-eight pigs were included in the study with 14 cases in each group. With a median time of 15 minutes, 9 pigs achieved ROSC in the 50% group and 8 pigs in the 100% group (p=0.699). During non-effective CPR PbO₂ (p=0.001) was higher with FiO₂ 100%, but rSO₂ showed no difference (p=0.070). During mechanical chest compressions there was no difference in rSO₂ (0.085) and PbO₂ (0.970) between groups. After ROSC the rSO₂ and PbO₂ increased significantly in both groups.

Conclusion:

The use of 100% oxygen during non-effective CPR improves brain oxygenation.

References:

Nelskylä A et al. Resuscitation 116:1-7, 2017