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作者简历：史红宇(1968~)男，沈阳人，主治医师在读硕士，本实验在北京中国医学科学院阜外心血管病医院麻醉与体外循实验室完成。

Experiment study of protection effect of Nicorandil in myocardial preservation solution

Shi Hongyu, ZhouGang, Zhang Futing, Lin Bingquan, Sun Zhaoyu, Long Cun

(The First Affiliated Hospital,Jiamushi University)

Abstract objective: Nicorandil(NCR) exerts its action as an ATP-sensitive potassium channel opener at low extracellular potassium concentration. we investigated the efficacy of using HTK solution and UW solution with NCR following 4 hours hypothermia preservation in the isolated rat heart mode. **Method**: Hearts isolated from male Wistar rats were mounted on a Langendorff apparatus to estimate baseline hemodynamic values. The hearts were divided into four groups(n=8 per group): Group1, UW solution; Group2, HTK solution; Group3, UW solution with Nicorandil; Group 4 , HTK solution with Nicorandil. They were arrested and stored at 4 ℃ in each preservation solution for 4 hours. After the cold storage, the hearts were reperfused and the recovery of myocardial function [including Left Ventricular End-Diastolic Pressure(LVEDP), Left Ventricular Developed Pressure(LVDP), and the rate of change in Left Ventricular Pressure(+dp/dt, -dp/dt)]were measured. Myocardial tissue water content was evaluated. Myocardial tissue Adenosine Triphosphate (ATP) and Creatine Phosphate(CP) content in each group were also measured just after cold storage. The leakage of myocardial enzymes were measured as well. Finally, myocardial ultrastructure was observed. **Result**:The recovery rate of myocardial function:The group of HTK was better than that in the group of UW ($P<0.05$); the group of HTK solution + Nicorandil was better than that in the group of HTK ($P<0.05$); The level of ATP and CP in myocardial tissue: the group of HTK was significantly better than that in the group of UW ($P<0.01$); HTK solution + Nicorandil was better than that in the group of HTK ($P<0.05$); group of HTK solution + Nicorandil was better than that in the group of UW solution with Nicorandil ($P<0.05$). There were no significant changes in the myocardial tissue water content of four groups; The leakage of myocardial enzymes: the group of HTK was better than that in the group of UW ($P<0.05$); The myocardial ultrastructure: The histological changes of myocardial cell and the damage to vascular endothelial cell were more significant in UW solution+nicorandil group compared with that in the HTK solution+nicorandil group. The histological changes were severer in UW solution group than that in the UW solution+nicorandil group. **Conclusion**:These results suggest that HTK solution is more effective than UW solution for myocardial preservation, and that NCR provides still better protection in the heart transplantation.

Key Words HTK solution; UW solution; Nicorandil; Myocardial preservation

松花江下游江水细菌总数和 BOD_5 相关性的研究

李中宇 王 岚 梁 朝

(佳木斯市环保监测站)

关键词 细菌总数；生化需氧量；相关性

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细菌由于代谢速度快，世代时间短，对环境变化的反映敏捷，所以作为河流环境的理化指标的指示生物有一定意义。本文对松花江下游细菌总数和 BOD_5 相关性进行了研究，现报告如下。

1 分析方法

细菌总数：平板法，营养琼脂培养基， 37 ℃培养24t . BOD_5(mg/L)：稀释接种法。

2 回归方程的建立及检验

2.1 回归方程的建立

通过 1997 年松花江佳木斯江段监测数据可以得到方程：细菌总数(千个/ml)=0.827BOD_5+0.111

2.2 方程的检验

经计算相关系数 $\gamma=0.654$ ，查表得 $\gamma_{0.01,20}=0.537$ ，$\gamma > \gamma_{0.01,20}$ 。

剩余标准差 SE=1.127 ，经检验满足 95.4%的点都落在直线细菌总数=0.827 BOD_5+2.365 和直线细菌总数=0.827 BOD_5-2.143 之间，表明该回归直线的精密度基本满足要求。

3 结论

①以上分析表明，细菌总数与 BOD_5(BOD_5<5mg/L)之间有较显著的相关性，随着 BOD_5 的增高，细菌总数会有显著增加，说明细菌数量是对江河有机污染反映敏感的指标。②回归方程的建立对江河的污染监测有一定的现实意义。对于条件差的监测单位可以通过建立相应的回归方程，来估计污染程度。

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作者简介：李中宇(1967~)女，黑龙江饶河人，工程师