



巯乙磺酸钠单独及联合环丙沙星抗大肠杆菌生物膜的作用(PDF)

《第三军医大学学报》[ISSN:1000-5404/CN:51-1095/R] 卷: 34 期数: 2012年第06期 页码: 488-491 栏目: 论著 出版日期: 2012-03-30

Title: Effects of mesna alone or combined with ciprofloxacin on *Escherichia coli* biofilm

作者: 陈盛; 余加林; 罗则佳; 何念海; 孙凤军
重庆医科大学附属儿童医院新生儿科; 成都军区总医院医务部; 第三军医大学西南医院: 儿科, 药学部

Author(s): Chen Sheng; Yu Jialin; Luo Zejia; He Nianhai; Sun Fengjun
Department of Neonatology, Children's Hospital, Chongqing Medical University, Chongqing, 400014; Department of Medical Administration, General Hospital of Chengdu Military Command, Chengdu, Sichuan Province, 610083; Department of Pediatrics, Department of Pharmacy, Southwest Hospital, Third Military Medical University, Chongqing, 400038, China

关键词: 大肠杆菌; 生物膜; 巯乙磺酸钠; 环丙沙星

Keywords: *Escherichia coli*; biofilm; mesna; ciprofloxacin

分类号: R378.21;R969.4;R978

DOI: -

文献标识码: A

摘要: 目的 研究巯乙磺酸钠(Mesna)对大肠杆菌生物膜(biofilm, BF)形成的影响, 以及单独及联合环丙沙星(ciprofloxacin, CIP)对大肠杆菌BF的作用。方法 琼脂平板稀释法检测 Mesna、CIP的最低抑菌浓度, 扫描电镜观察Mesna对大肠杆菌BF形成的作用, 平板计数法检测Mesna单独及与CIP联用后BF内活菌数, 用激光共聚焦显微镜(confocal laser scanning microscopy, CLSM) 观察Mesna对已形成的大肠杆菌BF空间结构的影响并结合BF图像结构分析软件(image structure analyzer, ISA) 定量分析BF结构参数。结果 Mesna能减少BF中基质样物质以及被膜的厚度; 单用Mesna (8 mg/ml) 才能使BF中的活菌数减少($P<0.05$), 单用CIP 1MIC才可使BF中活菌数降低($P<0.05$), 小剂量Mesna (1 mg/ml)与1/2 MIC的CIP联合应用就可使BF上的活菌数明显减少($P<0.05$); CLSM图像显示经Mesna作用后的BF厚度逐渐减少, 密度逐渐稀疏; ISA软件定量分析显示: 5 mg/ml Mesna作用后, BF厚度、平均扩散距离(average diffusion distance, ADD)和结构熵(textual entropy, TE)均减少($P<0.05$), 区域孔隙率(areal porosity, AP)增加($P<0.05$), 2 mg/ml Mesna干预后, 效应不如高浓度明显。结论 Mesna能够抑制大肠杆菌BF形成, 破坏成熟大肠杆菌BF形态结构; Mesna与环丙沙星存在协同作用, 增强其杀菌能力。

Abstract: Objective To investigate the effect of mesna on the formation of *Escherichia coli* biofilm (BF), and to study the effects of mesna alone and mesna combined with ciprofloxacin on *E. coli* BF. Methods Agar dilution method was used to detect the minimum inhibitory concentrations (MIC) of mesna and ciprofloxacin (CIP) and the numbers of bacteria in the BF treated with mesna alone and mesna combined with CIP. The formation of *E. coli* BF was observed by scanning electron microscopy (SEM), and the BF structure was observed by confocal laser scanning microscopy (CLSM). The parameters of BF structure were quantitatively analyzed by an image structure analyzer (ISA). Results The SEM results showed that the mucoid material in the BF and the thickness of the BF were significantly reduced by mesna. The single use of mesna 8 mg/ml or CIP 1 MIC could significantly reduce the number of viable bacteria in BF ($P<0.05$), while mesna 1 mg/ml combined with CIP 1/2 MIC could achieve the same effect ($P<0.05$). CLSM results showed that the BF was thinner and more scattered in the mesna group than in the control group. ISA results showed that with the treatment of mesna 5 mg/ml, the thickness, average diffusion distance (ADD) and textual entropy (TE) of the BF decreased significantly ($P<0.05$), and the areal porosity (AP) of the BF increased significantly ($P<0.05$). The effects of mesna 2 mg/ml were not as significant as those of mesna 5 mg/ml. Conclusion Mesna can inhibit *E. coli* BF formation and affect its structure, and enhance the antibacterial activity of CIP, showing synergistic effects.

参考文献/REFERENCES

陈盛, 余加林, 罗则佳, 等. 巯乙磺酸钠单独及联合环丙沙星抗大肠杆菌生物膜的作用[J]. 第三军医大学学报, 2012, 34(6):488-491.

备注/Memo: -

更新日期/Last Update: 2012-03-22

导航/NAVIGATE

[本期目录/Table of Contents](#)

[下一篇/Next Article](#)

[上一篇/Previous Article](#)

工具/TOOLS

[引用本文的文章/References](#)

[下载 PDF/Download PDF\(1020KB\)](#)

[立即打印本文/Print Now](#)

[推荐给朋友/Recommend](#)

[查看/发表评论/Comments](#)

统计/STATISTICS

[摘要浏览/Viewed](#)

全文下载/Downloads 76

评论/Comments 43

[RSS](#) [XML](#)