

· 基础与临床研究 ·

PEG-CL/LA 膜负载甲硝唑药物的体外缓释及抗菌性能研究

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【摘要】目的 研究以聚乙二醇-聚己内酯-丙交酯(PEG-CL/LA)为聚合物载体的甲硝唑缓释膜的体外抗菌和药物释放性能, 旨在研制一种新型的具有抗菌作用的药物缓释膜。**方法** 用紫外分光光度法测定 5wt%、8wt% 及 10wt% 甲硝唑药膜中药物的体外释放度; 选用牙周可疑致病菌具核梭杆菌(Fn)和致龋菌变异链球菌(Sm), 采用抑菌圈法研究 3 种药膜对厌氧菌和兼性厌氧菌的抗菌性能。**结果** (1) 药膜在载药量为 5wt%~10wt% 时具有较好的缓释性能, 药物释放时间随着甲硝唑含量的增加而缩短, 3 种比例的载药膜的释放时间均可达 7 天以上, 其中, 5wt% 药膜可达 10 天。(2) 随着药物含量增加, 抗菌作用逐渐增强, 5wt% 载药膜对 Sm 和 Fn 的抑菌圈直径分别为 (8.00 ± 0.16) mm 和 (8.07 ± 0.09) mm; 8wt% 载药膜为 (10.13 ± 0.19) mm 和 (11.13 ± 0.09) mm; 10wt% 载药膜为 (12.07 ± 0.09) mm 和 (19.33 ± 0.94) mm。该药膜对具核梭杆菌的抑制作用强于对变异链球菌的抑制作用。**结论** PEG-CL/LA 载药膜对牙周致病菌的抑制作用效果明显, 且具有良好的药物缓释性能, 是一种有望用来辅助治疗牙周疾病的药物膜。

【关键词】 甲硝唑聚乙二醇-己内酯-丙交酯聚合物 药物缓释 抗菌性

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In vitro study of drug release properties and antibacterial activity of medical PEG-CL/LA membranes loaded metronidazoleHuang Zhengmei^{1, 2} Ma Xiaofei³ Junu Karki^{1, 2} Wang Shenchun³ Lang Meidong³ Zhang Xiuyin^{1, 2}

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【Abstract】Objective To evaluate drug release properties and antibacterial effect of metronidazole sustained-release membranes made of polyethylene glycol-caprolactone-lactide(PEG-CL-LA) with various drug loadings (5wt%, 8wt% and 10wt%). **Methods** 1. *In vitro* drug release properties were examined by ultraviolet spectrophotometry. 2. Antibacterial effect on *Streptococcus mutans* and *Fusobacterium nucleatum* was observed on solid culture medium. **Results** 1. Membranes tested here released drug slowly. Time required for drug release was longer than 7 days, and was decreased by increasing drug loading. 2. Membranes had strong inhibitory effect on both *S. mutans* and *F. nucleatum*, and antibacterial activity was enhanced with higher drug loading. Membranes loaded with drug at 10wt% showed larger inhibition zone with a diameter of (12.07 ± 0.09) mm and (19.33 ± 0.94) mm

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