

论著

肝素在分子吸附再循环治疗肝衰竭中的应用及对凝血指标的影响

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摘要:

目的:观察分子吸附再循环系统(molecular adsorbent recirculating system,MARS)治疗肝衰竭时无肝素和肝素循环对患者凝血指标的影响,评价2种抗凝技术的安全性。方法:对174例凝血酶原活动度(PTA)≤40%的肝衰竭患者按随机分组原则进行前瞻性实验性研究。根据抗凝方式不同分为无肝素组92例次,肝素组82例次。选择治疗0,0.5,1,2,3,4,5,6 h共8个时间点动态观察凝血指标变化,统计管路/滤器凝血、出血等不良事件的发生情况。结果:2组之间凝血酶原时间(PT),PTA,国际标准化数值(INR)差异无统计学意义( $P>0.05$ )。肝素组使用首剂抗凝后激活部分凝血活酶时间(APTT)、凝血酶时间(TT)迅速升高,30 min即达峰值,无肝素组略有上升,2组治疗中各时间点均数比较差异有统计学意义( $P<0.05$ )。肝素组纤维蛋白原(Fbg)曲线趋于平稳,无肝素组逐步下降,在治疗的2.5 h出现交互,差异有统计学意义( $P=0.001$ )。肝素组2例(2.44%)术后严重出血,无肝素组1例(1.09%)III级凝血治疗中断。结论:血液与MARS循环管路接触时发生Fbg吸附,抗凝支持可减少吸附。PTA≤40%肝衰竭患者MARS治疗前应根据凝血参数、弥散性血管内凝血(DIC)检测、临床症状等综合评估凝血状态,高凝期选择肝素循环有助于MARS顺利完成的同时改善高凝状态,防治DIC;低凝期选择无肝素循环能有效避免出血,理论上可通过降低血液中性肝素物质等改善患者凝血机制。

关键词: 肝衰竭 人工肝支持 抗凝技术 凝血参数 弥散性血管内凝血

Impact of heparin on coagulation index during the therapy of molecular adsorbent recirculating system in patients with liver failure

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Abstract:

Objective To investigate the impact of coagulative parameters on different anticoagulation systems in molecular adsorbent recirculating system (MARS) in subjects with liver failure, and to evaluate the safety of different anticoagulation methods. Methods A prospective experimental observation was designed. According to anticoagulation methods, 174 MARS treatment sessions for 146 patients with liver failure and prothrombin time activity percentage (PTA) ≤ 40% were randomly divided into 2 groups: 92 MARS treatment sessions in the heparin-free group and 82 in the low-dose heparin group. Time points of 0, 0.5, 1, 2, 3, 4, 5 and 6 h were selected to observe the coagulation changes of prothrombin time (PT), PTA, thrombin time (TT), activated partial thromboplastin time (APTT) and international normalized ratio (INR) dynamically. Adverse events such as line / filter coagulation, rupture and bleeding were also investigated and compared due to frequency and severity between the 2 groups. Results There was no difference in PT, PTA, INR between the 2 groups, but significant differences were observed in APTT and TT and fibrinogen (Fbg). APTT and TT levels in the low-dose heparin group was increased rapidly after the first given dose of anticoagulant heparin and reached the peak within 30 min. The levels at each time point was statistically different between the 2 groups ( $P<0.05$ ). A significant difference in the Fbg level was obtained between the 2 groups. In the low-dose heparin group it was stabilized and increased slightly at the end of the treatment. While in the heparin-free group it was decreased gradually and reached a ravine at the end of the treatment. A curve was observed after 2.5 h treatment between the 2 groups ( $P=0.001$ ). There were 2 cases of severe bleeding after MARS was finished in the heparin group, and 1 was terminated because of degree III clotting in the heparin-free group. Conclusion Fibrinogen should be adsorbed while the blood touches the MARS circuit path and anticoagulants can prevent it. Comprehensive analysis of blood platelet count (BPC), fibrin degradation products (FDP), D-dimer and clinical symptoms is critical and required to determine the coagulation status to select an anticoagulation system before MARS. The use of low dose heparin in MARS improves the disorder of hypercoagulable state during the high coagulation period, while heparin-free during low coagulation period can effectively prevent the occurrence of bleeding and improve the mechanism of blood coagulation by reducing heparin-like substance in the blood.

Keywords: liver failure artificial liver support anticoagulation method coagulation parameter disseminated intravascular coagulation

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