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急性高容量血液稀释(AHHD)对靶控输注(TCI)不同溶剂丙泊酚血药浓度的影响

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Effects of acute hypervolemic hemodilution (AHHD) on plasma concentration of different solvents of propofol by target controlled infusion (TCI)

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摘要

目的 观察急性高容量血液稀释(acute hypervolemic hemodilution, AHHD)对靶控输注(target controlled infusion, TCI)不同溶剂丙泊酚血药浓度及脑电双频指数(bispectral index, BIS)的影响,以指导血液稀释期间麻醉药丙泊酚的使用。方法 40例ASA I~II级择期手术患者随机分为4组:长链丙泊酚稀释组(LH组)与未稀释组(L组),中长链丙泊酚稀释组(MH组)与未稀释组(M组),每组10例。全程使用丙泊酚TCI静脉麻醉,以血浆靶浓度4 μg/mL进行诱导气管插管,插管后即刻降至3 μg/mL持续输注。在3 μg/mL丙泊酚TCI 10 min时, LH和MH组以15 mL/kg输注羟乙基淀粉130/0.4氯化钠注射液实施血液稀释, L和M组输注乳酸林格氏液。于术前(T0)、3 μg/mL丙泊酚输注10 min (T1)、70 min (T2)、90 min (T3)时,采集动脉血,测定血球压积(hematocrit, Hct),用HPLC法测定丙泊酚浓度,同时观察BIS的变化。结果 T2、T3与T0相比较, LH组Hct值分别降低25.6%、28.2%, MH组Hct值分别降低28.9%、28.2%。T2、T3时LH、MH组丙泊酚血药浓度分别为1.80、1.78 μg/mL和1.84、1.76 μg/mL,均明显低于靶控浓度3 μg/mL (P<0.05)。稀释组丙泊酚血药浓度明显低于未稀释组(P<0.05)。LH、MH组在T2、T3时的BIS值分别为49.89、49.55和49.66、49.33,较L、M组的41.89、41.22和40.55、40.67明显升高(P<0.01)。不同溶剂丙泊酚间的血药浓度无明显差异。结论 AHHD后丙泊酚的血药浓度较TCI设定值明显下降,且BIS值有所上升,因此为了维持麻醉深度可能需要增加丙泊酚剂量,且两种不同溶剂丙泊酚间没有差异。

关键词 : 急性高容量血液稀释(AHHD), 丙泊酚, 血药浓度, 脑电双频指数(BIS), 靶控输注(TCI)

Abstract :

Objective To study effects of acute hypervolemic hemodilution (AHHD) on plasma concentration and bispectral index (BIS) of different solvents of propofol by target controlled infusion (TCI), for regulating use of propofol during hemodilution. Methods Forty patients of ASA I-II undergoing elective surgery were randomly equally divided into 4 groups: group L and LH were infused with propofol long chain fat emulsion injection, and group M and MH with propofol medium and long chain fat emulsion injection. Group LH and MH were for AHHD. All cases accepted total intravenous anesthesia, and were induced and maintained by TCI of propofol at 4 μg/mL and 3 μg/mL. Group LH and MH were infused with hydroxyethyl starch of 15 mL/kg. Group L and H were infused with Ringer's solution according the physical loss. Arterial blood samples were collected before the operation (T0) and 10, 70 and 90 min after TCI of propofol at 3 μg/mL (T1, T2, T3), while BIS and hematocrit (Hct) were recorded. Propofol concentration was detected by HPLC. Results Hct values of group LH and MH dropped 25.6%, 28.2% and 28.9%, 28.2% after AHHD. Plasma concentration of propofol dropped 1.80, 1.78 μg/mL and 1.84, 1.76 μg/mL in group LH and MH, which were significantly lower than those in group L and M (P<0.05). These values remain unchanged in Group L and M. BIS values were 49.89, 49.55 and 49.66, 49.33 in group LH and MH after AHHD respectively, it was apparently higher than group L and M (P<0.01). It has no obviously difference between different solvents of propofol. Conclusions After AHHD, the actual plasma concentration of propofol showed below the set one, while BIS increase. Propofol dose should be increased for keep accurate anesthetic depth. There was no difference between two different solvents of propofol.

Key words : acute hypervolemic hemodilution (AHHD) propofol plasma concentration bispectral index (BIS) target controlled infusion (TCI)

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