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Effects of glucose-insulin-potassium on isolated rat myocardial energy metabolism

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Abstract **Objective:** To study the effect of glucose-insulin-potassium (GIK) solution on energy metabolism in isolated working heart after ischemia/reperfusion. **Methods:** Wistar rats were randomized into the control, ischemia/reperfusion and GIK-protected groups. After the model of isolated working heart was established with Langendorff device, the contents of adenosine triphosphate (ATP), adenosine diphosphate (ADP) and adenosine monophosphate (ATP) were detected with high performance liquid chromatography (HPLC), total adenine nucleotides (TAN) and energy charge (EC) of myocardium calculated, the activity of myocardial membranaceous Na^+-K^+-ATPase measured with biochemistry and the content of myocardial mitochondrial calcium assayed with atomic absorption spectrophotometry. **Results:** Ischemia/reperfusion resulted in the significant decrease of ATP content, ATP/ADP ratio, TAN and EC of myocardium and activity of myocardial membranaceous Na^+-K^+-ATPase and the remarkable increase of the content of myocardial mitochondrial calcium. All these changes were restored normal by administration of GIK solution. **Conclusion:** GIK solution can improve the cardiac function through increasing myocardial ATP content and decreasing the content of myocardial mitochondrial mitochondrial calcium.

Key words myocardium; ischemia/reperfusion; adenosine triphosphated; mitochondrion; calcium; rat

T型管造影致休克2例报告

Report of 2 cases of shock caused by radiography with T-shaped tube

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1 临床资料

T型管造影有时可引起严重反应,现将我们所遇到的两例报告如下。

病例1,女,67岁。三月前因阻塞性黄疸在外院行剖腹探查,诊断为"胆管癌",仅行T型管引流术,黄疸部分消退后带管出院。来我院后为进一步明确诊断而行T型管造影,见T型管内胆汁呈淡绿色,推注25%的国产胆影葡胺40 ml,1 min后患者出现寒战,停止造影,送回病访后测血压8/4 kPa,予以抗休克和抗感染治疗,升压药维持24 h后,血压逐渐恢复正常。

病例2,男,53岁。因胆总管结石,化脓性胆管炎行胆囊切除、胆总管切开取石、T型管引流术,术后14 d黄疸消退,体温血象正常,但引流胆汁内有较多絮状物。行T型管造影,造影剂同上例,推注后3 min,患者出现寒战,回病房后持续寒战继而高热,血压9.4/6.6 kPa,予以抗休克抗感染治疗,次日患者发现严重应激性溃疡、上消化道大出血,经抢救无效死亡。

2 讨论

正常肝脏胆汁分泌压为1.96 kPa,大于2.94 kPa时,胆汁分泌停止,肝内毛细胆管破裂,胆汁经肝内静脉或淋巴返流入血[1]。经T型管推注造影剂时,胆管内瞬间压力可超过7.84 kPa[2],为肝胆汁分泌压的数倍,此时如胆道感染未控制,胆道内细菌和毒素可随造影剂返流入血,由于胆道感染主要是G-菌,所产生的内毒素可迅速引起休克。病例1因带管时间长,T型管污染严重。病例2胆汁内有较多的絮状物,提示可能有感染存在,因而在造影时均出现严重中毒反应。此外,也不能排除两例患者系碘过敏可能性,术前由于严重黄疸或急性发病未行静脉胆道造影,故而未做过碘过敏试验,造影时造影剂返流入血,引起了严重过敏反应。

防止T型管造影严重毒性反应的措施:① 胆道感染完全控制后再造影,即体温血象正常、临床症状消失、黄疸基本消退。此外,引流的胆汁应清亮无混悬物。② 造影前轻轻抽吸T型管内胆汁,必要时用生理盐水10~20 ml轻缓冲洗2~3次,以稀释和排出可能存在的细菌和毒素。③ 推注造影剂时力度适中,切勿用力过猛,采用滴注法最为安全[2]。④ 为防止造影剂本身毒性反应,必要时在造影前可小剂量应用地塞米松。

关键词 胆管;休克;造影
中图法分类号 R816.5

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