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Segmental distribution of electrolytes and water in spinal cord after ischemioreperfusion injury in conscious rabbits

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Abstract The segmental distribution of Ca, Mg, Fe, Na and K water in the spinal cord before and after ischemia-reperfusion injury was observed in 71 conscious rabbits. Neither segmental difference nor remarkable wave-like distribution of each electrolyte and water was found in the spinal cord of the control. In the 1st and 2nd hour after reperfusion, the level of Mg and K was decreased and that of Ca, Fe and Na and water significantly increased in the L_7 to T_8 segments of the spinal cord. Abnormal level of Ca, Mg and Fe and water was found 20 minutes after ischemia and 24 hours after reperfusion but was normal 2 hours after reperfusion, which is coincident with secondary neuromotor dysfunction. On the 7th day after reperfusion of 10～35 minutes of ischemia, the same changes of electrolytes and edema formation as mentioned above were observed in rabbits with secondary paralysis and acute permanent paraplegia. The changes of Ca level were wave-like in the segments of the spinal cord in all the time-points, that is, the Ca level was significantly lower in L_4 and L_8 than in L_7, L_5 and L_3. These findings suggest that the imbalance of electrolytes and edema formation after ischemioreperfusion injury are significantlly correlated to the the damaged segment and the severity of neuromotor dysfunction.

Key words ischemia; reperfusion injury; spinal cord; electrolyte; edema

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动脉导管未闭症漏斗征的X线观察

X-ray observation on infundibulum of the patent ductus arteriosus

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动脉导管未闭症是一种常见的先天性心脏病,X线平片仍不失为常用的诊断方法之一。主动脉漏斗征是动脉导管未闭症的特有X线征象,在动脉导管未闭症的X线诊断上具有重要意义。本文通过手术病例的术中观察、X线平片及主动脉造影片的分析,对X线片上漏斗征形成的病理基础进行了研究。提出了影响漏斗征显示的因素和投照的最佳体位。

1 材料与方法

1.1 临床资料

本组经手术证实的335例动脉导管未闭症中,男性104例,女性231例,男:女=1:2.2,年龄平均为11.7(2.5～40)岁,13岁以下儿童233例,占69.5%。术中探查,未闭导管直径平均为1.09(0.3～2.8) cm,其中导管直径大于1.6 cm者41例(12.2%)。导管长径平均为0.87(0.2～2.5) cm。选出各种资料完整的247例进行分析,其中204例(82.6%)术中可见未闭导管附着处主动脉呈漏斗样扩张,术中见未闭导管呈漏斗形者仅72例(29.1%),其余为圆柱形。

1.2 X线所见

对247例的X线胸片进行了分析,其中正位胸片上可见漏斗征者105例(42.5%)。该105例中有67例术中见未闭导管为圆柱状。而X线片上未见漏斗征的142例中,有28例术中见未闭导管为漏斗形。前者术中可见导管主动脉端之主动脉有漏斗样扩张,后者却无此表现。本组6例进行了主动脉造影,6例于造影片上均可见导管附着处主动脉有漏斗样扩张。但只有3例于平片上可见漏斗征。2例未闭导管为漏斗形,4例为圆柱形。两例可见平片上显示漏斗征者,未闭导管每型各1例。

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The effects of dietary zinc on the proliferation of thymocytes and splenocytes in rats

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Abstract The effects of dietary zinc on the proliferation function of thymocytes and splenocytes were observed in zinc-deficient (ZD), zinc-excessive (ZE), adequate libitum (AL) and pair fed (PF) rats with flow cytometric analysis (FACS). The findings were as follows:

(1)The total cells number of the thymus, spleen in G_0/G_1 phases were much higher in ZD and ZE groups than in PF and AL groups, and the total cells number in S, G_2 and M phases were lower in the former than in the latter.

(2)The RNA and protein contents in thymocytes and splenocytes in ZD and ZE groups were significantly lower than those in PF and AL groups, the levels of cAMP and the cAMP/cGMP ratio in thymocytes and splenocytes in ZD and ZE groups were significantly higher than those in PF and AL groups, the levels of cGMP in splenocytes were lower in former than in latter.

It was concluded that both zinc deficiency and zinc excessive could suppress the normal proceeding of cell cycle and the proliferation of thymocytes and splenocytes by mainly affecting the levels of cAMP and cGMp and the cell synthesisof thymus and spleen, leading to the reducing of the immunity functions of organisms.

Key words zinc; thymocytes; splenocytes; cell proliferation

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2 讨论

Jonsson 等[1]首先于1952年描述主动脉"漏斗征"，李益群等[2]认为，漏斗征的形成与未闭导管分流处的血液动力学有关，由于导管分流处管腔横截面骤然增大，血流速度减慢，血流对邻近管壁的压强增大，从而造成血管分叉处主动脉局部扩张，形如漏斗状，投影于正位片上即为主动脉弓与肺动脉段间的凹陷缩小或消失，并见主动脉弓与降主动脉的移行区下移，亦称漏斗征。少数病例因未闭导管较粗，分流量较大，左心室增大，可造成心脏稍向右旋转，正位片上可见主动脉弓与肺动脉段间出现另一弧状突起[3]，为漏斗征的另一少见 X 线表现，本组仅3例有此种表现。

李益群氏分析动脉导管未闭的主动脉造影片提出，不论年龄大小、未闭导管类型如何，导管附着之主动脉局部管腔均可见有不同程度的漏斗状扩张，本组6例造影片亦有同样表现。经心脏大血管模型的模拟病理改变观察也提示了未闭导管附着之主动脉局部的扩张，是形成正位平片上漏斗征的关键病理基础改变。并非为以往教科书[4]所提及的，漏斗征是由于漏斗形未闭侍管投影所致。本组105例平片上可见漏斗征者，有67例术中见未闭导管为圆柱型。而28例术中见导管为漏斗型者，平片上又未能显示漏斗征，这也进一步说明了漏斗征并非为漏斗型导管投影所致。手术及造影所见主动脉局部漏斗样扩张为何远远高于 X 线平片所见呢？我们经过多方位的模型观察认为，心脏投照体位影响较大。当有动脉导管未闭而还未产生肺动脉高压时，以左心室增大为主的心脏呈稍微左前斜样旋转，因此影响了漏斗征的显示，如投照时给予体位上的人工纠正(即右前斜5°)可能阳性显示率能明显提高。平片主动脉漏斗征的阳性率亦受未闭导管粗细、走向及平片摄影条件等影响，如导管粗、前后走向及高仟伏摄片则阳性率增加，反之则低。

部分术后复查的动脉导管未闭症患者，虽然肺血及心脏大小已恢复正常，但主动脉漏斗征依然可见，这也提示已形成的主动脉漏斗样扩张改变较恒定，并进一步说明，绝大多数的主动脉漏斗征并非为漏斗状未闭导管投影而致，因手术后未闭导管已结扎。

关键词 动脉导管未闭；主动脉漏斗征
中图法分类号 R541.1

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