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持续颅内压监测对大面积脑梗死外科治疗预后的应用价值*

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摘要 目的:探讨持续颅内压(ICP)监测对大面积脑梗死外科治疗预后的应用价值。**方法:**选取2013年3月至2018年3月期间在我院接受治疗的大面积脑梗死患者100例作为研究对象,所有患者经去骨瓣减压术后行ICP监测和生命体征监测,通过结果分为:低压组62例($2.70\text{kPa} \leq \text{ICP} < 5.30\text{kPa}$),高压组38例($\text{ICP} \geq 5.30\text{kPa}$)。记录患者ICP监测数值,接收者操作特征(ROC)曲线分析患者预后情况,对患者进行术后3个月内随访,了解患者平常活动能力进行判断预后的状况。观察ICP与预后的相关性。**结果:**两组患者性别、年龄、室速、室性早搏、糖尿病、高血压病、脑卒中、高脂血症、风心病、冠心病、扩张性心肌病、既往心肌梗死、肥厚性心肌病、甲亢性心脏病等资料比较差异无统计学意义($P>0.05$)。低压组患者中预后良好的ICP监测值显著低于预后不良者($P<0.05$),高压组中预后良好的ICP监测值显著低于预后不良者($P<0.05$)。ICP预测大面积脑梗死外科治疗预后的ROC曲线面积0.704,采用最大约等指数计算得出ICP预测大面积脑梗死外科治疗预后的最大AUC面积相应参数截止值为4.89,其中敏感度为0.435,特异性为0.896。**结论:**持续ICP监测结果显示ICP值越小,患者的预后就越好,ICP值越高,患者的预后越差。ICP监测对大面积脑梗死外科治疗的预后具有预测价值,对判断和改善预后能起到有效帮助,值得在临床推广应用。

关键词: 颅内压;持续颅内压监测;大面积脑梗死;预后;应用价值

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The Application Value of Continuous Intracranial Pressure Monitoring in the Prognosis of Surgical Treatment of Large Area Cerebral Infarction*

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ABSTRACT Objective: To explore the application value of continuous intracranial pressure (ICP) monitoring in the prognosis of surgical treatment of large area cerebral infarction. **Methods:** From March 2013 to March 2018, 100 patients with large area cerebral infarction who were treated in our hospital were selected as the study objects. All patients underwent ICP monitoring and vital signs monitoring after decompressive operation. According to the results, they were divided into the low pressure group with 62 patients ($2.70\text{kPa} \leq \text{ICP} < 5.30\text{kPa}$) and the high pressure group with 38 patients ($\text{ICP} \geq 5.30\text{kPa}$). ICP monitoring value was recorded, receiver operating characteristic (ROC) curve was used to analyze the prognosis of the patients, and the patients were followed up within 3 months after the operation to understand the prognosis of the patients' normal activity ability. The correlation between ICP and prognosis was observed. **Results:** There was no significant difference in gender, age, ventricular tachycardia, premature beat, diabetes, hypertension, stroke, hyperlipidemia, rheumatic heart disease, coronary heart disease, dilated cardiomyopathy, previous myocardial infarction, hypertrophic cardiomyopathy and hyperthyroid heart disease between the two groups ($P>0.05$). The ICP monitoring value of the patients with good prognosis in the low pressure group was significantly lower than that of the patients with poor prognosis ($P<0.05$). The ICP monitoring value of the patients with good prognosis in the high pressure group was significantly lower than that of the patients with poor prognosis ($P<0.05$). The area of ROC curve predicted by ICP was 0.704. Calculated the maximum area of AUC predicted by ICP for surgical treatment of massive cerebral infarction by using the most approximate index, and the corresponding cut-off value of the parameter was 4.89, sensitivity was 0.435, specificity was 0.896. **Conclusion:** The results of continuous ICP monitoring showed that the smaller the ICP value, the better the prognosis of the patients. The higher the ICP value, the worse the prognosis of the patients. ICP monitoring has a predictive value for the prognosis of surgical treatment of large scale cerebral infarction, and it can play an effective role in judging and improving the prognosis, which is worth popularizing in clinical application.

Key words: Intracranial pressure; Continuous intracranial pressure monitoring; Large area cerebral infarction; Prognosis; Application value

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前言

近些年,缺血性脑血管疾病发病率在我国逐步增长,且趋于年轻化趋势,据文献统计全球约10%~15%的脑卒中患者发生大面积脑梗死^[1,2]。该病对脑组织损伤严重,病死率及致残率较高,主要是由高血压、糖尿病、风心病等一些基础疾病引起^[3,4]。既往有研究报道^[5,6],去骨瓣减压术治疗大面积脑梗死,疗效确切,能有效改善患者预后,降低大面积脑梗死病死率。去骨瓣减压术主要是指把颅骨去除一部分,将硬脑膜打开,促使颅内压(intracranial pressure, ICP)降低、减轻脑干受压及脑组织肿胀等^[7,8]。针对大面积脑梗死患者 ICP 的实际水平,以往都是依靠观察 MRI 影像学资料、神经系统、CT 等相关检查^[9],很难对患者的病情进行有效判定。有研究显示^[10,11],ICP 是相对于大气压的颅内空间的压力,可反映脑脊髓轴的容量增减及患者适应这些变化能力间的动态关系。ICP 很少恒定不变,易受个体多样性和生理波动性的影响而呈现出一系列变化。而 ICP 监测可及时反映患者病情变化,且可持续监测,对改善患者预后有很好的帮助,优于头颅 CT 检查。目前 ICP 监测主要用在重度颅脑损伤治疗,而在大面积脑梗死疾病治疗应用的报道较少,其临床效果到底如何,仍需更多的研究来进一步证实。本文通过对我院收治的部分大面积脑梗死患者给予持续 ICP 监测并予以相关治疗,取得不错的疗效。现将结果报道如下。

1 资料与方法

1.1 一般资料

选取 2013 年 3 月至 2018 年 3 月期间在我院接受治疗的大面积脑梗死患者 100 例作为研究对象,纳入标准:(1)符合脑梗死诊断标准,临床主要表现为恶心呕吐、头痛、偏瘫、意识水平改变、失语、瞳孔改变等;(2)患者均经 CT 或 MRI 等影像学证实为大面积脑梗死;(3)通常在静态下发病,病后几小时或几天内到达高峰;(4)年龄在 40-70 岁;(5)患者及家属均签署知情同意书;(6)均具备手术指征,经去骨瓣减压手术治疗。排除标准:(1)颅内肿瘤术后及介入手术仍有脑梗死;(2)梗死后脑出血;(3)蛛网膜下腔出血后大面积脑梗死;(4)重要脏器功能不全;(5)长期使用各类抗凝药物者。本研究获得我院医院伦理委员会批准通过。所有患者经去骨瓣减压术后行 ICP 监测和生命体征监测,通过结果分为:低压组 62 例($2.70\text{kPa} \leq \text{ICP} < 5.30\text{kPa}$),高压组 38 例($\text{ICP} \geq 5.30\text{kPa}$)。

1.2 方法

所有大面积脑梗死患者均行去骨瓣减压手术救治,在术中在硬膜或者脑室下置入探头并予调回零位并连接监护仪器,通过监护仪观察记录 ICP 值。在术后 72h 内每隔 1h 观察患者的生命体征、临床状况、瞳孔、意识等动态并记录 ICP 监测数值。根据监测信息,结合患者生命体征及临床表现等情况,及时 CT 复查头颅,观察其出血或脑水肿等情况,合理调整脱水剂用量、抗菌药等相关药物使用时间,避免了不合理应用药物而促使并发症发生。ICP 判定标准^[12],正常:小于 15mmHg ($1\text{mmHg} \approx 0.133\text{kPa}$);重度:大于 40mmHg ;中度: $21\text{--}40\text{mmHg}$;轻度: $15\text{--}20\text{mmHg}$ 。

1.3 观察指标

记录患者 ICP 监测数值,采用门诊复查的方式对患者进行术后 3 个月内随访,了解患者平常活动能力进行判断预后的状况。观察 ICP 与预后的相关性。采用格拉斯哥预后(GOS)^[13]评分对患者的预后恢复情况进行评价,其中死亡记为 1 分;患者意识清醒,但是生活需要照料记为 2 分;患者可独立生活,中度残疾记为 3 分;患者能够正常生活,可伴有轻度缺陷记为 4 分;恢复良好记为 5 分,其中 5 分、4 分评估为预后良好。低压组中有 54 例预后良好,8 例预后不良者;高压组中有 23 例预后良好,15 例预后不良者。

1.4 统计方法

运用统计学软件 SPSS13.0 分析,计数资料用率(%)表示,运用 χ^2 检验分析;用 $\bar{x} \pm s$ 表示计量资料,运用 t 检验方式进行两组的均数比较;ICP 与预后的相关性使用 ROC 曲线分析; $P < 0.05$ 代表有统计学差异。

2 结果

2.1 两组一般资料对比

两组患者性别、年龄、室速、室性早搏、糖尿病、高血压病、脑卒中、高脂血症、风心病、冠心病、扩张性心肌病、既往心肌梗死、肥厚性心肌病、甲亢性心脏病等资料比较差异无统计学意义($P > 0.05$),见表 1。

2.2 低压组和高压组预后良好与不良分析对比

低压组患者中预后良好的 ICP 监测值显著低于预后不良者($P < 0.05$),高压组中预后良好的 ICP 监测值显著低于预后不良者($P < 0.05$);详见表 2。

2.3 ICP 与预后的相关性使用 ROC 曲线分析

ICP 预测大面积脑梗死外科治疗预后的 ROC 曲线面积 0.704,采用最大约等指数计算得出 ICP 预测大面积脑梗死外科治疗预后的最大 AUC 面积相应参数截止值为 4.89,其中敏感度为 0.435,特异性为 0.896, $P = 0.032$ 。详见图 1

3 讨论

大面积脑梗死病情极其凶险,严重可引起水肿、脑缺血、脑梗坏死等^[14]。若患者颅内高压没能及时处理,将会导致脑疝、昏迷、病死率高,仅靠内科常规药物救治死亡率高达 80%(主要死于严重脑疝)^[15,16]。去骨瓣减压术作为大面积脑梗死的外科治疗手段,对颅内高压患者能及时缓解症状,挽救生命,但其致残率却相当高^[17-19]。目前仍缺乏相关指标对去骨瓣减压术后进行监测。如患者 ICP 持续增高,会加重脑内组织水肿及脑损害,导致神经受损。因此对 ICP 有效的监测十分必要。ICP 不同的监测方式同样会影响预后,有研究认为,脑室型 ICP 监测相比其他方式植入探头监测,对颅内感染风险更高,从而影响预后^[20,21]。持续 ICP 监测被大量研究证实是一种较为有效监测手段,它可以动态的反映 ICP 变化,能及时有效的反映患者病情变化,及时采取有效的干预措施,防止病情的进一步恶化^[22-24]。

本研究发现持续 ICP 监测结果显示 ICP 值越小,患者的预后就越好,ICP 值越高,患者的预后越差。ICP 预测大面积脑梗死外科治疗预后的 ROC 曲线面积 0.704,我们运用最大约登指数计算出 ICP 预测大面积脑梗死外科治疗预后最大 AUC 面积相应参数截止值为 4.89 (敏感度 = 0.435, 特异性 = 0.896, $P = 0.032$)。

表 1 两组一般资料对比[n(%)]

Table 1 Comparison of general data between two groups [n (%)]

Projects	Low pressure group	High pressure group	t/χ^2	p
Male	38	30	3.376	0.066
Female	24	8		
Average age (years)	55.42± 6.81	55.83± 6.91	1.321	0.242
Ventricular tachycardia	5(8.06)	1(2.63)	1.233	0.267
Premature beat	4(6.45)	2(5.26)	0.059	0.808
Diabetes	10(16.13)	4(10.52)	0.614	0.443
Hypertension	8(12.90)	3(7.89)	0.604	0.437
Stroke	7(11.29)	2(5.26)	1.045	0.307
Hyperlipidemia	6(9.68)	3(7.89)	0.091	0.762
Rheumatic heart disease	4(6.45)	1(2.63)	0.724	0.395
Coronary heart disease	10(16.13)	8(21.05)	0.387	0.534
Dilated cardiomyopathy	7(11.29)	5(13.16)	0.078	0.780
Previous myocardial infarction	7(11.29)	7(18.42)	2.400	0.121
Hypertrophic cardiomyopathy	2(3.23)	0(0.00)	1.218	0.270
Hyperthyroid heart disease	4(6.45)	2(5.26)	0.059	0.808

表 2 低压组和高压组预后良好与不良分析对比($\bar{x} \pm s$)Table 2 Analysis and comparison of good prognosis and poor prognosis in low pressure group and high pressure group($\bar{x} \pm s$)

Groups	Prognosis	n	ICP monitoring value(kpa)	t	p
Low pressure group (n=62)	Good	54	2.14± 0.57	2.204	0.031
	Poor	8	2.62± 0.61		
High pressure group (n=38)	Good	23	5.43± 0.76	2.100	0.040
	Poor	15	6.03± 0.71		

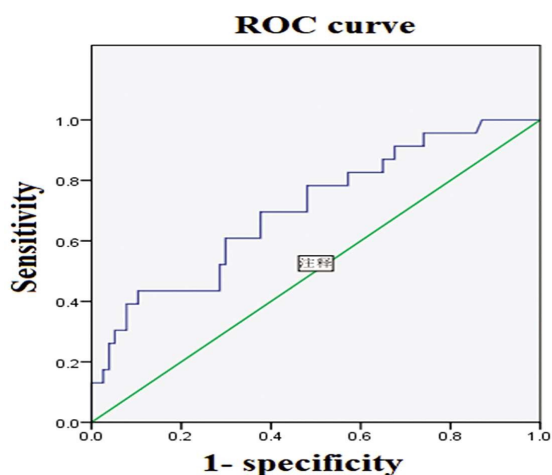


图 1 ICP 与预后的相关性使用 ROC 曲线

Fig.1 Correlation between ICP and prognosis using ROC curve

032), 可以发现 ICP 对大面积脑梗死外科治疗的预后具有预测价值。其原因可能是:(1)ICP 与脑血氧指数相关,既往有研究通过对重型颅脑损伤患者脑进行 ICP 和脑血氧指数监测发现,ICP 与脑血氧指数有关^[25],其中在低压时(20-50 mmHg)呈负相

关。ICP 到达一定的数值(50 mmHg)会显著影响脑灌注压,从而急剧降低脑内血流量,持续 ICP 监测结果大于 20 mmHg,需积极给予降低 ICP 的治疗措施,有助于改善患者的预后^[26]。(2) ICP 与脑组织凝血酶有关,杨伟东等^[27]用免疫组化方法测定高血压脑出血患者的脑组织凝血酶含量,结果发现 ICP 与凝血酶阳性率具有相关性,而凝血酶在一定程度上会影响脑出血患者脑水肿严重程度,进而影响脑出血患者的预后。(3)大面积脑梗死外科治疗的预后影响因素众多,颅内感染,脑内组织水肿,早期肠内影响,大脑中动脉高密度征,颅脑水肿,静脉溶栓等。从长期看 ICP 对患者的预后影响到底如何,还需更长的观察时间及更大数据样本来证实^[28-30]。

综合上述,虽然 ICP 不一定是影响预后的主要因素。但是 ICP 监测技术能让医生更快的获取患者 ICP 的实际水平,进而对治疗方案采取及时、有效的调整,提高治疗疗效,从而改善预后。因此,我们认为持续 ICP 监测对大面积脑梗死外科治疗的预后具有预测价值,能为临床医师判断提供更多临床经验外的参考,值得在临床推广应用。

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