

# 血清 C-反应蛋白、降钙素原及乳酸在脑外伤患者术后颅内感染诊断意义研究

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**摘要:**目的 探讨血清 C-反应蛋白(CPR)、降钙素原(PCT)及乳酸在脑外伤患者术后颅内感染的诊断价值。方法 选取 87 例神经外科脑外伤术后患者,按照颅内感染标准,将患者分为感染组( $n=47$ )和非感染组( $n=40$ ),感染组患者根据预后又分为治愈组、好转组和加重、无效组。检测血清 CPR、PCT 及乳酸水平的变化情况,比较各指标受试者工作特征(ROC)曲线下面积。结果 感染组患者血清 CPR、PCT 及乳酸水平明显增加( $P<0.05$ );与治愈组和好转组相比,加重、无效组 CPR、PCT 明显升高( $P<0.05$ ),治愈组血清 CPR 及 PCT 水平明显低于好转组( $P<0.05$ );血清 CPR、PCT 及乳酸 ROC 曲线下面积分别为 0.876, 0.966, 0.717( $P<0.05$ ),血清 PCT 在  $8.10 \mu\text{g} \cdot \text{L}^{-1}$  时为最佳截断点,诊断的敏感度为 89.4%,特异度为 92.5%,优于其他两项血清指标。结论 血清 CPR、PCT 及乳酸的检测,有望成为鉴别诊断颅内感染的新型标志物。

**关键词:**颅内感染;C-反应蛋白;降钙素原;乳酸

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## Significance of serum CRP, PCT and lactic acid in the diagnosis of postoperative intracranial infection in patients with brain injury

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**Abstract:** **Objective** To explore the diagnostic value of C reactive protein (CRP), procalcitonin (PCT) and lactic acid for intracranial infection. **Methods** Eighty-seven patients were assigned into two groups: infection group ( $n=47$ ) and non-infection group ( $n=40$ ) according to intracranial infection criteria, the patients in the infection group were assigned into the cure group, the improved group and the aggravating and ineffective group according to the prognosis. Serum CRP, PCT and lactic acid were tested and compared. The diagnostic value was evaluated by means of the area under curve of receiver-operating-characteristic (ROC) curve. **Results** Compared with the control group, serum CRP, PCT and lactic acid were significantly increased in infection group ( $P<0.05$ ). Compared with the aggravating group and ineffective group, serum CRP and PCT significantly reduced in the cure group and the improved group ( $P<0.05$ ). Serum CRP and PCT in the cure group significantly reduced than that in the improved group ( $P<0.05$ ). The area under curve of serum CRP, PCT and lactic acid were 0.876, 0.966, 0.717 ( $P<0.05$ ), respectively. The optimal cut-off point of serum calcitonin was  $8.10 \mu\text{g} \cdot \text{L}^{-1}$ , the sensitivity of diagnosis was 89.4%, specificity was 92.5%, which was better than the other two serum markers. **Conclusions** The test of serum CRP, PCT and lactic acid is expected to be a novel biomarker for the diagnosis of intracranial infection. **Key words:** Intracranial infection; C reactive protein; Procalcitonin; Lactic acid

颅内感染是脑外伤患者术后常见的并发症,一旦发生感染患者经常出现意识障碍、颅内高压等严重并发症,病情危重并且治疗效果不佳,是导致脑外伤患者手术效果降低、医疗成本增加、住院周期增长、病死率升高的重要原因之一<sup>[1-2]</sup>。因此能够早期准确诊断脑外伤患者术后感染,从而及时有效的治疗对改善术后颅内感染的发生具有重要的临床意义。目前脑外伤患者术后颅内感染的金标准为脑脊液细菌培养,但多数感染类型细胞培养时间长,阳性培养率不高,此外预防性抗生素的应用,致使病原体耐药性的增强,这些均不利于术后的早期

诊断<sup>[3]</sup>。而对于颅内感染临床主要通过相关症状体征以及实验室辅助生化指标检测进行经验性治疗<sup>[4]</sup>。如何能更便捷、更早期、更有效地诊断发现脑外伤患者颅内感染,仍是正在进行研究的难题。本研究回顾性分析航天中心医院 2014 年 11 月—2016 年 10 月脑外伤外科手术后患者的临床资料,探讨血清 C-反应蛋白(CPR)、降钙素原(PCT)及乳酸对颅内感染的诊断价值。

### 1 资料与方法

**1.1 一般资料** 选取 2014 年 11 月—2016 年 10 月航天中心医院神经外科脑外伤术后患者 87 例,