

· 临床研究 ·

## 严重烧伤病人 TNF- $\alpha$ 和 TNFR I、II 水平测定的临床意义

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**【摘要】** 目的: 探讨严重烧伤后血 TNF- $\alpha$ 、TNFR I、TNFR II 水平变化及临床意义。方法: 28 例严重烧伤病人, 分为死亡组、生存组、伴吸入性损伤组和并发脓毒症组, 在入院立即和感染时期采用 ELISA(酶联免疫吸附试验) 定量检测 TNF- $\alpha$ 、TNFR I、TNFR II 水平。结果: 烧伤急性期 TNFR I 水平和 TNFR II 水平达到最高值, 且与 TBSA、BI 呈正相关, 随后 TNFR I、II 逐渐下降而 TNF- $\alpha$  仍升高, 但与 TBSA、BI 无正相关关系。TNFR I、II 水平生存组显著低于死亡组、吸入性损伤组与非吸入性损伤组无统计学差异, TNF- $\alpha$  水平、生存组与死亡组、吸入性损伤组与非吸入性损伤组均无显著性差异。在烧伤感染期均并发感染或脓毒症, TNFR I、II 峰值水平高于入院时测定水平, 且与 TBSA、BI 呈正相关, 死亡组明显高于生存组, 并发脓毒症组 TNFR I 水平明显高于未并发脓毒症组。TNF- $\alpha$  峰值水平与 TBSA、BI 呈正相关, 死亡组 TNF- $\alpha$  水平显著高于生存组。TNF- $\alpha$  与 TNFR I、TNFR II 呈正相关, TNFR I 与 TNFR II 呈正相关。结论: TNFR I、TNFR II 水平在烧伤急性期和感染期均升高, 烧伤病情越重水平越高, 能反映烧伤严重程度和转归, TNF- $\alpha$  的测定对烧伤并发感染及其严重程度、预后有意义。

**【关键词】** 烧伤; 细胞因子; 感染; 死亡率

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**Clinical Significance of the Determination of the Levels of TNF- $\alpha$  and TNFR I, II in Severely Burned Patients** Li Li-ping, Ding La-chun, Duan Fei-jiao, et al. Dept. of Burns and Plastic Surgery, The 1st Affiliated Hospital of Nanhua University 421001

**【Abstract】 Objective:** To explore the significance of the changes in the levels of TNF- $\alpha$  and TNFR I and II in blood post burn. **Method:** 28 cases were divided into death group, survival group, inhalation injury complication group and sepsis complication group. TNF- $\alpha$  and TNFR I, TNFR II levels were determined upon hospitalization and in infection stage, using ELISA method. **Results:** In acute burn stage, TNFR-I and II levels were raised and was positively correlated to TBSA and BI, after that the levels began to decline; TNF- $\alpha$  kept at high level but no positive correlation with TBSA and BI. In survival group, TNFR-I and II levels were lower than that in the death group. In inhalation injury complication group and non-inhalation injury complication group, the difference between TNFR-I and II levels was not significant. TNF- $\alpha$  level in survival and death groups, as well as in inhalation injury complication and non-inhalation injury complication groups was not positively correlated to BI. The peak values of TNFR-I and II levels were higher in patients complicated with infection and sepsis than that determined upon hospitalization and were positively correlated with TBSA and BI. In death group, TNFR-I and II levels were significantly higher than that in survival group. In sepsis complication group, TNF- $\alpha$  level was significantly higher than that in non-sepsis group. TNF- $\alpha$  level was positively correlated to TBSA and BI, in death group, TNF- $\alpha$  level was significantly higher than that in survival group. TNF- $\alpha$  level was positively correlated with TNFR-I and II levels. **Conclusion:** TNF- $\alpha$  and TNFR-I and II levels were raised at acute and infection stages, the more serious the case the higher the levels. Determination of the levels of TNF- $\alpha$  and TNFR-I and II is of significance in prognosis.

**【Key words】** Burn; Cell factor; Infection; Death rate

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烧伤后机体立即作出强烈反应, 而且烧伤越重(烧伤面积越大和/或伴吸入性损伤)反应越强烈, 并发感染(创面感染或脓毒症)反应更为强烈。以往不少研究报道炎症细胞因子, 如肿瘤坏死因子  $\alpha$

(TNF- $\alpha$ )、白介素 1(IL-1)和白介素 6(IL-6)等能反映烧伤严重程度<sup>[1-4]</sup>, 烧伤并发脓毒症时, TNFR I、II 水平升高<sup>[5-7]</sup>, 而且预后不好。本研究旨在探索烧伤急性期和感染阶段的肿瘤坏死因子受体 I、II(TNFR I、II)水平与烧伤严重程度的关系。

### 一、材料与与方法

研究对象为 28 例严重烧伤患者,均在伤后 4 小时之内入院。烧伤总面积(TBSA)54.2% ± 25.0% (22% - 98%),烧伤指数(BI)为 44.6 ± 20.8 (16 - 96),平均年龄为 52.4 岁 ± 19.0 岁(18 岁 - 78 岁),吸入性损伤 17 例(60.7%),15 例(53.6%)并发脓毒症,12 例(42.9%)死亡,其中二例在伤后 72 小时内死亡,其余 10 例在伤后一周后死亡。

病人入院后立即抽静脉血液放入肝素化试管内,离心获得血浆。用酶联免疫吸附试验(ELISA)进行 TNFR I、II 定量和 TNF-α 定量。

所有变量值用  $\bar{x} \pm SD$  表示,并进行 t 检验,计算相关系数。显著检验水准为  $\alpha = 0.05$ 。

### 二、结果

1. 入院时 TNFR I、II 水平 P: 病人入院时正处于烧伤急性期,感染尚未发生,TNFR I 和 TNFR II 达最高水平,随后逐渐下降。TNFR I 水平(1.3 ± 0.6ng/ml)和 TBSA 呈正相关关系;TNFR I 与 BI 呈正相关关系( $r = 0.6829, p = 0.0006$ )。TNFR II (3.8 ± 1.3ng/ml)与 TBSA 呈正相关,与 BI 呈正相关( $r = 0.6468, p = 0.0028$ )。TNF-α 水平(7.9 ± 6.8pg/ml)与 TBSA( $r = 0.1641, p = 0.6034$ )或与 BI( $r = -0.2060, p = 0.8474$ )无正相关关系。

生存组 TNFR I 值(0.9 ± 0.2ng/ml)明显低于死亡组值(1.7 ± 0.9ng/ml),生存组 TNFR II 值(2.8 ± 1.4ng/ml)明显低于死亡组值(4.6 ± 1.9ng/ml)。

生存组 TNF-α 水平(6.7 ± 6.0pg/ml)和死亡组水平(9.8 ± 7.0pg/ml)无显著性差异( $P = 0.2676$ )。合并吸入性损伤组 TNFR I 水平(1.6 ± 0.9ng/ml)高于无吸入性损伤组(0.9 ± 0.2ng/ml),但统计比较没有显著性差异( $P = 0.0928$ )。吸入性损伤者 TNF-α 值(7.9 ± 7.0pg/ml)和无吸入性损伤者 TNF-α 值(7.9 ± 7.9pg/ml)也无统计学差异( $P = 0.8764$ )。烧伤急性期 TNFR I 水平与 TNFR II 水平呈正相关( $r = 0.8648, p < 0.0012$ ),而 TNF-α 与 TNFR I 水平( $r = 0.2336, p = 0.5856$ )或 TNFR II 水平( $r = 0.2496, p = 0.4868$ )没有相关性。

2. 烧伤感染期 TNFR I 和 TNFR II 峰值: 此期所有烧伤患者均并发了创面感染或脓毒症,测得 TNFR I 和 TNFR II 水平均高于入院时的测定值。TNFR I 峰值(9.4 ± 7.8ng/ml)与 TBSA、BI( $r = 0.5899, p = 0.0035$ )呈正相关;TNFR II 峰值(12.2 ± 7.6ng/ml)与 TBSA、BI( $r = 0.5890, p = 0.0056$ )呈正相关。

TNF-α 峰值水平(194.1 ± 249pg/ml)与 TBSA ( $r = 0.7696, p = 0.0001$ ) BI( $r = 0.6968, p = 0.0001$ )均呈正相关。

生存组 TNFR I 峰值水平(7.2 ± 4.9ng/ml)明显低于死亡组峰值(15.0 ± 9.8ng/ml),生存组 TNFR II 峰值水平(7.0 ± 5.4ng/ml)也明显低于死亡组峰值(16.8 ± 5.3ng/ml),死亡组 TNF-α 峰值(222.9 ± 106.8pg/ml)明显高于生存组峰值(148.5 ± 308.8pg/ml,  $p = 0.0003$ )。

并发脓毒症病例 TNFR I 峰值水平(14.3 ± 8.4ng/ml)明显高于未发生脓毒症者 TNFR I 峰值(5.4 ± 2.3ng/ml,  $p = 0.0236$ )。TNF-α 达峰值水平时,TNF-α 与 TNFR I、TNFR II 水平呈正相关。TNFR I 与 TNFR II 相关关系极为显著( $r = 0.9064, p < 0.0001$ )。

### 三、讨论

普遍认为炎性细胞因子如 TNF-α 水平高低与烧伤的严重程度有关,尤其与并发感染的严重程度密切相关<sup>[3,5,8]</sup>。TNFR I、II 具有抗炎作用<sup>[5,7]</sup>,对抗 TNF-α 致炎作用。TNFR I 主要由上皮细胞和成纤维细胞等表达,TNFR II 主要由免疫活性细胞等表达。

本研究表明,TNFR I、II 入院时水平与 TBSA、BI 密切相关,提示 TNFR I、II 水平随烧伤严重程度而变化。而 TNF-α 没有这样表现。因为烧伤后不可能立即并发感染,烧伤后立即出现的 TNFR I、II 水平升高是机体对烧伤刺激的反应。本研究证实 TNFR I、II 与 TBSA、BI 呈正相关,足以证明了这一点。但也有报道认为 TNFR I、II 是外科应激反应的抗炎细胞因子反应,是机体对非感染性刺激的反应。

烧伤并发感染时 TNF-α、TNFR I、II 水平均升高,而且与 TBSA、BI 均呈正相关,提示 TBSA、BI 越大感染程度可能越重。同时亦提示,感染时 TNF-α 值升高刺激 TNFR I、II 值升高。有报道 TNFR 血水平升高抑制 TNF-α 效应,TNF-α 与 TNFR 间的平衡影响炎症的严重程度。

本研究结果表明,严重烧伤病人无论是否并发感染 TNFR I、II 水平均升高,烧伤越重升高越明显、并发感染后,病情越重,TNF-α、TNFR I、II 水平越高,达高水平平衡。显然不能用 TNF-α 和 TNFR I、II 平衡论解释病情严重程度。因此认为:TNFR I、II 水平能够反映烧伤或烧伤并发感染后的严重程度与预后;TNF-α 水平测定对烧伤并发感染严重程度

和预后的估计可能有一定的价值。

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## MEBO 治疗小儿 II 度烧伤创面的临床效果观察

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【摘 要】目的 探讨湿润暴露疗法治疗小儿 II 度烧伤创面的疗效。方法 随机选择 86 例患儿分两组进行比较,即 43 例采用 MEBO 治疗(A 组)43 例采用 SD - Ag 治疗(B 组),观察两组治疗效果。结果:A 组疼痛发生率,感染发生率,瘢痕出现率及手术例数,创面愈合时间均明显低于 B 组( $P < 0.01$ ),有非常显著性差异。结论:湿润烧伤膏是目前治疗小儿 II 度烧伤创面的理想方法。

【关键词】 MEBO; 小儿烧伤; II 度 治疗

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**The Efficacy of MEBO in Treating Pediatric Second Degree Burn Wounds** Li Fu - qiang, Liang Dong Dept. of Burns, People's Hospital of Bishan County, Chongqing 402760

【Abstract】 **Objective:** To investigate the efficacy of MEBO in treating pediatric 2nd degree burn wounds. **Method:** 86 burn children were divided randomly into 2 groups. 43 cases in MEBO group and 43 in SD - Ag group. The efficacy of the two groups was compared. **Results:** In MEBO group, the pain incidence, infection rate and scar forming rate were lower than that of SD - Ag group, the wound healing time was shorter and number of cases subjected to operation was fewer. ( $P < 0.01$ ). **Conclusion:** MEBO is an ideal remedy for treating pediatric 2nd degree burn wounds.

【Key words】 MEBO; Pediatric burn; Second degree; Treatment

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