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TEG 功能性纖維蛋白原分析可能高估纖維蛋白原水準

TEG® Functional Fibrinogen Analysis May Overestimate Fibrinogen Levels

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Anesthesia & Analgesia: 2014 118 933–935

纖維蛋白原對於持續出血患者至關重要。這項研究比較了由血栓彈力圖（TEG）測量的纖維蛋白原濃度與 Clauss 法確定的血漿纖維蛋白原濃度之間區別。納入 63 名手術患者和 38 名健康對照者。在整個組中(患者和對照 n = 101), TEG® 功能性纖維蛋白原較血漿纖維蛋白原濃度平均高出 1.0 g / L (3.5 vs 2.5 g / L, 差異 95%可信區間 0.8 ~ 1.2 g / L,P < 0.0001)。對患者組和對照組分別進行分析後也得出了類似結果。與傳統的測量方法比較，使用 TEG® 可能高估血漿纖維蛋白原濃度。

（李峰日 譯 陳傑 校）

Fibrinogen is of crucial importance in patients with ongoing bleeding. In this study, we compared fibrinogen concentration measured by thrombelastography (TEG®) with fibrinogen plasma concentration determined by Clauss. Sixty-three surgical patients and 38 healthy controls were included. For the whole group (patients and controls, n = 101), TEG® functional fibrinogen was on average 1.0 g/L higher than the plasma fibrinogen concentration (3.5 vs 2.5 g/L, 95% confidence interval for difference 0.8 to 1.2 g/L, P < 0.0001). Similar patterns were observed when patients and healthy controls were analysed separately. The fibrinogen level may be overestimated when assessed using TEG® compared with the fibrinogen plasma concentration measured by the conventional method.

在實驗性小鼠中暑模型中血栓調節蛋白改善肝臟損傷，凝血功能障礙和死亡率

Thrombomodulin Improved Liver Injury, Coagulopathy, and Mortality in an Experimental Heatstroke Model in Mice

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Anesthesia & Analgesia 2014 118 956–963

背景：中暑是一種威脅生命的疾病，可引起多臟器損傷而造成很高的死亡率。血栓調節蛋白（TM）是一種內皮細胞分泌的抗凝輔助因數，在血管內凝血的調節中起重要作用。本實驗研究血栓調節蛋白在實驗性中暑模型中，對炎症過程、肝功能、凝血狀態和死亡率的作用。

方法：雄性 C3H/HeN（8-10 周）小鼠隨機分配到 TM 治療組（TG-預處理）或非治療中暑組（HS）。在 TG-預處理組，在熱暴露前使用重組可溶性 TM（1mg/kg，腹腔內注射）處理小鼠。在某些實驗中，重組可溶性 TM 是在熱暴露（TG-延遲組）期間給藥。小鼠通過暴露於 38℃的環境溫度下 4 h 誘導中暑發生。熱暴露後，測定腫瘤壞死因數-α（TNF-a）、白介素 6（IL-6）和血漿高遷移率族蛋白 1（HMGB-1）、肝功能指標、血漿穀草轉氨酶和穀丙轉氨酶的濃度以及肝臟的免疫組織化學和組織病理學特徵。同時測定凝血狀態、血漿蛋白 C 水準和凝血酶 - 抗凝血酶複合物水準。

結果：中暑組熱暴露後血漿細胞因數和 HMGB1 的濃度增加，血漿穀草轉氨酶和穀丙轉氨酶濃度升高，肝臟有強烈而廣泛 HMGB1 免疫表達。此外，有大量的肝細胞壞死和細胞核的裂解。在中暑組中，血漿蛋白 C 水準被抑制，血漿凝血酶 - 抗凝血酶複合物水準增高。

在 TG 預處理組中，血漿細胞因數和 HMGB1 含量的升高與 HS 組相比受到抑制；肝損傷、凝血功能障礙、死亡率也有所改善。此外，重組可溶性 TM 治療甚至能延緩治療時機，降低死亡率。

結論：本研究表明重組可溶性 TM 抑制熱暴露後血漿細胞因數和 HMGB1 濃度的升高。重組可溶性 TM 也改善了肝損傷和凝血功能障礙，降低死亡率甚至延長治療時機。重組可溶性 TM 對於中暑病人可能是一種有益的治療。

（林甲票 譯 陳傑 校）

BACKGROUND: Heatstroke is a life-threatening illness and causes high mortality due to multiple organ injuries. Thrombomodulin (TM) is an endothelial anticoagulant cofactor that plays an important role in the regulation of intravascular coagulation. In this study, we investigated the effect of TM on the inflammatory process, liver function, coagulation status, and mortality in experimental heatstroke.

METHODS: Male C3H/HeN (8–10 weeks) mice were randomly assigned to the TM-treated group (TG-Pre) or nontreated heatstroke group (HS). In group TG-Pre, mice were treated with recombinant soluble TM (1 mg/kg, intraperitoneally) before heat exposure. In some experiments, recombinant soluble TM was administrated during heat exposure (TG-Delay). Heatstroke was induced by exposure to ambient temperature of 38°C for 4 hours. After heat exposure, the levels of tumor necrosis factor-α, interleukin-6, and plasma high-mobility group box 1 (HMGB1), liver function, plasma aspartate aminotransferase and alanine aminotransferase concentrations, and immunohistochemical and histopathological characteristics of the livers were determined. The coagulation status, plasma protein C levels, and thrombin–antithrombin complex levels were also measured.

RESULTS: In group HS, plasma cytokines and HMGB1 concentrations increased after heat exposure. Plasma aspartate aminotransferase and alanine aminotransferase concentrations increased after heat exposure. In group HS livers, strong and extensive immunostaining for HMGB1 was observed. In addition, there was extensive hepatocellular necrosis and collapse of nuclei observed. In group HS, plasma protein C levels were suppressed and plasma thrombin–antithrombin complex levels increased. In group TG-Pre, plasma cytokines and HMGB1 concentrations were suppressed after heat exposure compared with group HS. Liver injury, coagulopathy, and mortality also improved in group TG-Pre. Furthermore, recombinant soluble TM treatment decreased mortality even with delayed treatment.

CONCLUSIONS: This study demonstrated that recombinant soluble TM suppressed plasma cytokines and HMGB1 concentrations after heat exposure. Recombinant soluble TM also improved liver injury and coagulopathy. Recombinant soluble TM treatment improved mortality even with delayed treatment. Recombinant soluble TM may be a beneficial treatment for heatstroke patients.

一項麻醉深度對長期預後影響的前瞻性、雙盲、隨機的初步研究

A Pilot Study for a Prospective, Randomized, Double-Blind Trial of the Influence of Anesthetic Depth on Long-Term Outcome

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Anesthesia & Analgesia 2014 118 981–986

背景：在 5 個觀察性研究中發現過深麻醉與死亡率增加相關。該相關可能原因或部分原因爲高危病人麻醉敏感程度增加。此項初步研究將評估一項完全的隨機對照試驗是否可行。研究目的是確定在高危組人群中麻醉深度靶控是否可行，並記錄與“深”和“淺”全麻中相關的藥物劑量與動脈血壓。

方法：ASA 分級 III-IV 級病人，年齡≥60 歲，手術時長≥2 小時，預期住院時間≥2 天，接受全身麻醉並隨機分配至腦電雙頻指數（BIS）/熵指數（SE）以 35 爲目標群組（“低”組）和以 50 爲目標群組（“高”組）。主要終點爲 BIS 或 SE 的平均值，次要終點爲 PACU 停留時間與疼痛評分、恢復品質評分、住院時長、術後併發症以及死亡。術後併發症（肺炎、心梗、中風、肺栓塞、心衰及死亡）的綜合終點定爲 1 年。

結果：125 例病人入組。低組和高組之間，在麻醉維持階段每個病人的 BIS/SE 平均中位數有顯著差異：39 對 48（平均差值 8[95%可信區間爲 6 至 8]，p＜0.001）。平均吸入麻醉用量（最小肺泡濃度）亦有顯著差異：0.98 對 0.64（平均差值-0.35[95%可信區間爲-0.44 至-0.26]，p＜0.001）。靶控的丙泊酚濃度亦有差別：4.0 對 3.1 μg/mL（平均差值-0.8[95%可信區間-1.2 至-0.3]，p=0.004）。術中平均動脈血壓相似（85 對 87mmHg，平均差值 2[95%可信區間爲-2 至 6]，p=0.86）。並且在短期復蘇特徵與住院時長方面沒有明顯區別。在 30 天有否發生傷口感染事件方面有顯著差別（13%對 3%，風險差值-10%[95%可信區間爲-21 至-0.1]，p=0.04）。在 1 年內，併發症的綜合發生率在低、高組分別爲 28%與 17%（風險差值-11[95%可信區間爲-25 至 4]，p=0.15），死亡率分別爲 12%對 9%（風險差值-2[95%可信區間爲-14 至 9]，p=0.7）。

結論：本次研究顯示在高危患者人群中伴有單獨的腦電圖監測指標，並以 BIS 或 SE 指導麻醉靶控深度是可行的。實現了對術後併發症和死亡率的預測。因此進行一項大型、多中心隨機對照試驗是可行的。

（賀加貝 譯 陳傑 校）

BACKGROUND: Deep general anesthesia has been associated with increased mortality in 5 observational studies. The association may be causal or an epiphenomenon due to increased anesthetic sensitivity in high-risk patients. We conducted a pilot study to assess the feasibility of performing a definitive randomized controlled trial. The aims of the study were to determine whether anesthetic depth targeting in a high-risk group was feasible and to document anesthetic doses and arterial blood pressures associated with “deep” and “light” general anesthesia.

METHODS: ASA physical status III and IV patients, aged ≥60 years, having surgery lasting ≥2 hours, with expected hospital stay ≥2 days, and receiving general anesthesia were randomly allocated to a Bispectral Index (BIS) or spectral entropy (SE) target of 35 (“low” group) or 50 (“high” group). The primary end point was mean BIS or SE. Secondary end points were postanesthesia care unit length of stay and pain scores, quality of recovery score, hospital length of stay, postoperative complications, and death. A composite end point of postoperative complications (pneumonia, myocardial infarction, stroke, pulmonary embolism, heart failure, and death) was determined at 1 year.

RESULTS: One hundred twenty-five patients were recruited. The mean of the median BIS/SE values for each patient during the maintenance phase of anesthesia in the low and high groups was significantly different: 39 vs 48 (mean difference 8 [95% confidence interval {CI95}, 6 to 10], P < 0.001). There was also a significant difference in mean volatile anesthetic administration (minimum alveolar concentration): 0.98 vs 0.64 (mean difference −0.35 [CI95, −0.44 to −0.26], P < 0.001) and target propofol concentrations: 4.0 vs 3.1 μg/mL (mean difference −0.8 [CI95, −1.2 to −0.3], P = 0.004). Intraoperative mean arterial blood pressures were similar (85 vs 87 mm Hg; mean difference 2 [CI95, −2 to 6], P = 0.86), and there were no differences in short-term recovery characteristics or hospital length of stay. There was a significant difference in the incidence of wound infection at 30 days (13% vs 3%; risk difference −10% [CI95, −21 to −0.1],

P = 0.04). At 1 year, the composite rates of complications in the low and high groups were 28% and 17% (risk difference −11 [CI95, −25 to 4], P = 0.15) and mortality rates were 12% and 9%, respectively (risk difference −2 [CI95, −14 to 9], P = 0.70).

CONCLUSIONS: This pilot study demonstrated that depth of anesthesia targeting with BIS or SE was achievable in a high-risk population with adequate separation of processed electroencephalogram monitor targets. The expected incidence of postoperative complications and mortality occurred. We conclude that a large, multicenter, randomized controlled trial is feasible.

產科麻醉和圍生醫學協會關於妊娠期心臟驟停管理的共識

The Society for Obstetric Anesthesia and Perinatology Consensus Statement on the Management of Cardiac Arrest in Pregnancy

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Anesthesia & Analgesia 2014 118 1003–1016

這一共識由產科麻醉和圍生醫學協會委員會於 2012 年發佈，其目的是通過提供衛生保健人員關鍵資訊(包括即時檢查清單)和產婦心臟驟停相關操作策略以達到改善產婦心肺復蘇品質。該共識中的建議主要圍繞衛生保健人員教育、行爲/交流策略,潛在系統性錯誤和的實踐的定期檢查，從而解決一些現實問題。此外，該共識還擴展至解釋和討論 2010 年美國心臟協會指南中產婦心肺復蘇的爭議問題。

（朱浩 譯 陳傑 校）

This consensus statement was commissioned in 2012 by the Board of Directors of the Society for Obstetric Anesthesia and Perinatology to improve maternal resuscitation by providing health care providers critical information (including point-of-care checklists) and operational strategies relevant to maternal cardiac arrest. The recommendations in this statement were designed to address the challenges of an actual event by emphasizing health care provider education, behavioral/communication strategies, latent systems errors, and periodic testing of performance. This statement also expands on, interprets, and discusses controversial aspects of material covered in the American Heart Association 2010 guidelines.

快通道髖膝關節置換術的術後認知功能障礙

Cognitive Dysfunction After Fast-Track Hip and Knee Replacement

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Anesthesia & Analgesia 2014 118 1034–1040

背景：據報導大手術術後患者的認知功能障礙（POCD）發生率高達 20%，尤其是老年患者，在術後的幾周和幾個月都可能存在此類問題。最近的研究中關於 POCD 的評估和診斷方法眾說紛紜，其發病機制仍然不詳。本研究採用標準方法評估了一個由大關節置換術（全髖和膝關節置換術）後老年病人組成的平衡佇列。給予患者最優圍術期管理（快通

道），包括減少阿片藥物的多模式鎮痛、早期活動和縮短住院時間（LOS≤3 天）儘快出院。

方法：在前瞻性多中心研究中，納入了 225 名大於 60 歲接受明確的快通道全髖關節或者全膝關節置換術患者。患者分別于術前、術後 1~2 周和 3 個月進行神經心理學測試。記錄 LOS、疼痛、阿片類藥物使用、炎症反應和睡眠品質情況。對一個社區居住的健康人群進行認知測試作爲對照組（n=161）。

結果：平均住院時間爲 2 天（四分位間距爲 2~3 天）。術後 1~2 周和 3 個月患者 POCD 的發生率分別爲 9.1%（95%CI: 5.4%~13.1%）和 8.0% (95% CI：4.5%~12.0%)。雖然可信區間較大，在發生和不發生早期 POCD 的患者中，疼痛、阿片類藥物使用、睡眠品質或 C 反應蛋白反應方面並無統計學差異。早期 POCD 患者術前的簡易精神狀態檢查評分較高(平均數差異爲 0.5 [95% CI：−1.0% ~ 0.0%]，P = 0.034)。由於樣本量太少無法證實早期和晚期 POCD 之間是否存在聯繫(早期 POCD 患者與非早期 POCD 患者發生晚期 POCD 的比例分別爲 23.6% vs 6.7%; 風險差異爲 16.9 (95% CI, −2.1% to 41.1%; P = 0.089)。

結論：快通道全髖和膝關節置換術後早期 POCD 發生率似乎比之前報導的此類手術發生率低，但是其晚期 POCD 發生率和之前報導的擇期非心臟大手術發生率相似，早晚期 POCD 之間的聯繫尚未被證實。

（邊文玉 譯 陳傑 校）

BACKGROUND: Postoperative cognitive dysfunction (POCD) is reported to occur after major surgery in as many as 20% of patients, elderly patients may especially experience problems in the weeks and months after surgery. Recent studies vary greatly in methods of evaluation and diagnosis of POCD, and the pathogenic mechanisms are still unclear. We evaluated a large uniform cohort of elderly patients in a standardized approach, after major joint replacement surgery (total hip and knee replacement). Patients were in an optimized perioperative approach (fast track) with multimodal opioid-sparing analgesia, early mobilization, and short length of stay (LOS ≤3 days) and discharged to home.

METHODS: In a prospective multicenter study, we included 225 patients aged ≥60 years undergoing well-defined fast-track total hip or total knee replacement. Patients had neuropsychological testing preoperatively and 1 to 2 weeks and 3 months postoperatively. LOS, pain, opioid use, inflammatory response, and sleep quality were recorded. The practice effect of repeated cognitive testing was gauged using data from a healthy community-dwelling control group (n = 161).

RESULTS: Median LOS was 2 days (interquartile range 2–3). The incidence of POCD at 1 to 2 weeks was 9.1% (95% confidence interval [CI], 5.4%–13.1%) and 8.0% (95% CI, 4.5%–12.0%) at 3 months. There was no statistically significant difference between patients with and without early POCD, regarding pain, opioid use, sleep quality, or C-reactive protein response, although the CIs were wide. Patients with early POCD had a higher Mini Mental State Examination score preoperatively (difference in medians 0.5 [95% CI, −1.0% to 0.0%]; P = 0.034). If there was an association between early POCD and late POCD, the sample size was unfortunately too small to verify this (23.6% of patients with early POCD had late onset vs 6.7% in non-POCD group; risk difference 16.9 (95% CI, −2.1% to 41.1%; P = 0.089).

CONCLUSIONS: The incidence of POCD early after total hip and knee replacement seems to be lower after a fast-track approach than rates previously reported for these procedures, but late POCD occurred with an incidence similar to that in previous studies of major noncardiac elective surgery. No association between early and late POCD could be verified.

一個以全關節置換爲重點的外科圍手術期家庭醫療模式的實施：一項管理案例報導

Implementation of a Total Joint Replacement-Focused Perioperative Surgical Home: A Management Case Report

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Anesthesia & Analgesia 2014 118 1081–1089

背景：在美國，圍術期的管理較爲多樣和獨立，而這種特點會增加錯誤和不良後果的發生，同時增加圍術期治療的成本。近年來，美國麻醉醫師協會提出了外科圍術期家庭醫療模式（PSH）這一觀念作爲這個問題的潛在處理方法。儘管 PSH 觀念已有描述，但這種新模式的實際應用未曾被報導。

方法：圍術期醫療工作者與麻醉科、圍術期護理及骨科相關人員一起研發並制定了一系列臨床監護方案來界定並規範對接受選擇性髖關節或膝關節成形術的病人術前、術中、術後及出院後的管理。本研究報導全關置換術 PSH 對住院時間（LOS）、圍術期輸血發生率、術後併發症、30 天再住院率、急診入院、死亡率及病人的滿意度。

結果：主要併發症的發生率爲 0(0.0–7.0)%，圍術期輸血率爲 6.2(2.9–11.4)%，院內死亡率爲 0(0.0–7.0)%,術後 30 內再住院爲 0.7 (0.0–3.8)%。所有外科監護改進專案實施爲 100(93.0–100.0)%。全膝置換及全髖置換住院時間中位數（95%可信區間）及[四分位間距]分別爲 3(2–3) [2–3] 和 3 (2–3) [2–3]。大約一半的病人出院後轉入當地護理中心而不是他們住所（70 例入特殊療養院，1 例入康復中心，39 例入衛生服務中心，36 例回家）。

結論：在全關節置換中採用外科圍術期家庭醫療模式所獲得的經驗爲提高病人的預後及獲得病人高滿意度方面提供了確實的證據。將來，住院成本的影響將會更好地量化。將來進行的比較 PSH 與傳統監護的研究需要把出院後監護考慮在內，因爲後者也是圍術期費用的重要影響因素。

（梁玉丹 譯 陳傑 校）

BACKGROUND: The perioperative setting in the United States is noted for variable and fragmented care that increases the chance for errors and adverse outcomes as well as the overall cost of perioperative care. Recently, the American Society of Anesthesiologists put forward the Perioperative Surgical Home (PSH) concept as a potential solution to this problem. Although the PSH concept has been described previously, “real-life” implementation of this new model has not been reported.

METHODS: Members of the Departments of Anesthesiology and Perioperative Care and Orthopedic Surgery, in addition to perioperative hospital services, developed and implemented a series of clinical care pathways defining and standardizing preoperative, intraoperative, postoperative, and postdischarge management for patients undergoing elective primary hip (n = 51) and knee (n = 95) arthroplasty. We report on the impact of the Total Joint Replacement PSH on length of hospital stay (LOS), incidence of perioperative blood transfusions, postoperative complications, 30-day readmission rates, emergency department visits, mortality, and patient satisfaction.

RESULTS: The incidence of major complication was 0.0 (0.0–7.0)% and of perioperative blood transfusion was 6.2 (2.9–11.4)%. In-hospital mortality was 0.0 (0.0–7.0)% and 30-day readmission was 0.7 (0.0–3.8)%. All Surgical Care Improvements Project measures were at 100.0 (93.0–100.0)%. The median LOS for total knee arthroplasty and total hip arthroplasty, respectively, was (median (95% confidence interval [interquartile range]) 3 (2–3) [2–3] and 3 (2–3) [2–3] days. Approximately half of the patients were discharged to a location other than their customary residence (70 to skilled nursing facility, 1 to rehabilitation, 39 to home with organization health services, and 36 to home).

CONCLUSIONS: We believe that our experience with the Total Joint Replacement PSH program provides solid evidence of the feasibility of this practice model to improve patient outcomes and achieve high patient satisfaction. In the future, the impact of LOS on cost will

have to be better quantified. Specifically, future studies comparing PSH to traditional care will have to include consideration of postdischarge care, which are drivers of the perioperative costs.

神經周圍注射與靜脈內注射地塞米松對坐骨神經阻滯預後的影響：一項隨機、雙盲、空白對照研究

The Effects of Perineural Versus Intravenous Dexamethasone on Sciatic Nerve Blockade Outcomes: A Randomized, Double-Blind, Placebo-Controlled Study

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Anesthesia & Analgesia 2014 118 1113–1119

背景：已經證實神經周圍使用地塞米松可作爲臂叢神經阻滯的輔助用藥，但神經周圍應用地塞米松使得鎮痛持續時間延長是否會對良好的外科恢復產生有利影響尚不明確。本研究假設接受地塞米松治療的患者相對未使用的患者會有更優良的外科恢復。同時也研究了神經周圍注射地塞米松和靜脈內注射地塞米松對阻滯特徵的影響。

方法：接受擇期踝部和足部手術的患者入組此項爲期 9 個月的研究。患者接受 B 超引導下的坐骨神經阻滯，藥物採用含 1：300,000(0.45 mL/kg)腎上腺素的 0.5%布比卡因，患者隨機分成三組：組 1：地塞米松（8 mg/2 mL）進行神經周圍注射並用靜脈注射生理鹽水 50ml，組 2：神經周圍注射 2ml 生理鹽水 ，8mg 地塞米松入 50ml 生理鹽水靜脈內注射，組 3：神經周圍注射 2ml 生理鹽水，靜脈內注射 50ml 生理鹽水。主要結果爲術後恢復品質評分(QoR-40)。次要結果爲鎮痛持續時間，阿片類藥物使用量，患者滿意度，數位化疼痛等級評分以及術後神經症狀。

結果：80 例患者進入隨機分組，78 例完成研究。神經周圍注射地塞米松組和神經周圍注射生理鹽水組 24 小時內 QoR-40 評分無明顯改進，中位數差值爲-3，95%CI 爲-7～3，靜脈內注射地塞米松和生理鹽水的中位數差值爲-1，95%CI 爲-8～5,神經周圍注射地塞米松與靜脈內注射地塞米松的中位數差值爲-2，95%CI 爲-6～5。鎮痛持續時間以及首次腳趾運動時間上，神經周圍注射地塞米松組均長於神經周圍注射生理鹽水組 ($P < 0.001$)。靜脈內注射地塞米松組首次腳趾運動時間顯著長於靜脈內注射生理鹽水組($P = 0.008$)，但鎮痛持續時間沒有著區別($P = 0.18$)。神經周圍注射地塞米松和靜脈內注射地塞米松組無論是鎮痛持續時間還是首次腳趾運動時間均無顯著區別。研究組之間的術後阿片類藥物使用量無明顯差別。24 小時內自主報告的神經症狀三組間無差異（神經周圍注射地塞米松組 17.63%，靜脈注射地塞米松組 10.42%，生理鹽水組 8.3%，$P = 0.31$）。所有術後神經併發症均在 8 周內消退。

結論：術前在神經周圍或靜脈內注射地塞米松相對於生理鹽水並不能改善 QoR-40 評分或降低阿片類藥物用量，但能延長擇期行足部和踝部手術接受坐骨神經阻滯的患者的鎮痛持續時間。由於缺少臨床有利的證據以及對動物實驗中發現地塞米松具有神經毒性的結論的關注，神經周圍注射地塞米松的臨床實踐需要更深入的研究。

（陸秉瑋 譯 陳傑 校）

BACKGROUND: Perineural dexamethasone has been investigated as an adjuvant for brachial plexus nerve blocks, but it is not known whether the beneficial effect of perineural dexamethasone on analgesia duration leads to a better quality of surgical recovery. We hypothesized that patients receiving dexamethasone would have a better quality of recovery than patients not receiving dexamethasone. We also sought to compare the effect of perineural with that of IV dexamethasone on block characteristics.

METHODS: Patients undergoing elective ankle and foot surgery were recruited over a 9-month period. Patients received ultrasound-guided sciatic nerve blocks by using 0.5% bupivacaine with epinephrine 1:300,000 (0.45 mL/kg) and were randomized into 3 groups: group 1 = perineural

dexamethasone 8 mg/2 mL with 50 mL IV normal saline, group 2 = perineural saline/2 mL with IV 8 mg dexamethasone in 50 mL normal saline, and group 3 = perineural saline/2 mL with 50 mL normal saline. The primary outcome was the global score in the quality of recovery (QoR-40). The secondary outcomes included analgesia duration, opioid consumption, patient satisfaction, numeric pain rating scores, and postoperative neurologic symptoms.

RESULTS: Eighty patients were randomized, and 78 patients completed the study protocol. There was no improvement in the global QoR-40 score at 24 hours between the perineural dexamethasone and saline, median (97.5% CI) difference of −3 (−7 to 3); IV dexamethasone and saline, median difference of −1 (−8 to 5); or perineural dexamethasone and IV dexamethasone median difference of −2 (−6 to 5). Analgesia duration ($P < 0.001$) and time to first toe movement ($P < 0.001$) were prolonged by perineural dexamethasone compared with saline. IV dexamethasone prolonged time to first toe movement compared with saline ($P = 0.008$) but not analgesia duration ($P = 0.18$). There was no significant difference in the time to first toe movement or analgesia duration between the perineural and IV dexamethasone groups. Postoperative opioid consumption was not different among study groups. Self-reported neurologic symptoms at 24 hours were not different among perinueral dexamethasone (17, 63%), IV dexamethasone (10, 42%), or normal saline (8, 30%) ($P = 0.31$). All postoperative neurologic sequelae were resolved by 8 weeks.

CONCLUSIONS: Preoperative administration of IV and perineural dexamethasone compared with saline did not improve overall QoR-40 or decrease opioid consumption but did prolong analgesic duration in patients undergoing elective foot and ankle surgery and receiving sciatic nerve block. Given the lack of clinical benefit and the concern of dexamethasone neurotoxicity as demonstrated in animal studies, the practice of perineural dexamethasone administration needs to be further evaluated.

腦腫瘤對凝血的增強：血紅素氧化酶-1 的作用

Brain Tumors Enhance Plasmatic Coagulation: The Role of Hemeoxygenase-1

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Anesthesia & Analgesia 2014 118 919–924

背景：血栓形成在腦腫瘤患者中具有高發病率和高死亡率。除腫瘤釋放組織因數相關微粒引起的凝血酶產生增加和高纖維蛋白原血症以外，腦腫瘤和腫瘤周圍正常腦組織也可能通過血紅素氧化酶-1（HO-1）系統產生內源性一氧化碳（CO）。研究證明，CO 可通過形成碳氧血紅素纖維蛋白原（COHF）促進凝血。因此，本研究旨在確定腦腫瘤患者是否存在過度增強的 HO-1 上調、CO 生成、血漿高凝狀態和 COHF 形成。

方法：研究納入 20 例行開顱手術的腦腫瘤患者，採集血液檢測碳氧血紅蛋白（HO-1 活性標誌物）、血漿高凝狀態（定義爲血凝塊強度大於正常血漿的 95%可信區間）和 COHF 形成（採用血栓彈性描記器測定）。購買 30 份正常血漿標本用作與腦腫瘤患者標本的對照。

結果：腦腫瘤患者碳氧血紅蛋白濃度爲 1.5% ± 0.5%（均數 ± 標準差），提示 HO-1 上調。與正常血漿標本相比，腦腫瘤患者血凝塊形成速率顯著增快（分別爲 5.2 ± 1.5 和 9.5 ± 2.3 dynes/cm/s，$P < 0.0001$），最終血凝塊強度顯著增高（分別爲 166 ± 28 和 230 ± 78 dynes/cm，$P = 0.00016$）。有 10 例腦腫瘤患者血漿凝塊強度超過正常受試者 95%可信區間，12 例腦腫瘤患者存在 COHF 形成。5 例高凝亞組的腦腫瘤患者存在 COHF 形成。最後，5 例高凝患者存在原發性腦腫瘤，而另 5 例患者存在轉移性腫瘤或炎症病變。

結論：一組腦腫瘤患者存在內源性 CO 生成增加、血漿高凝狀態和 COHF 形成的情況。未來研究應著眼於 HO-1 衍生的 CO 在腦腫瘤相關性血栓形成傾向發病機制中的作用

（陳彬彬 譯，李士通 審校）

BACKGROUND: Patients with brain tumors suffer significant thrombotic morbidity and mortality. In addition to increased thrombin generation via tumor release of tissue factor-bearing microparticles and hyperfibrinogenemia, brain tumors and surrounding normal brain likely generate endogenous carbon monoxide (CO) via the hemeoxygenase-1 (HO-1) system. CO has been shown to enhance plasmatic coagulation via formation of carboxyhemefibrinogen (COHF). Thus, our goals in this study were to determine whether patients with brain tumors had increased HO-1 upregulation/CO production, plasmatic hypercoagulability, and formation of COHF.

METHODS: Patients with brain tumors (N = 20) undergoing craniotomy had blood collected for determination of carboxyhemoglobin as a marker of HO-1 activity, plasmatic hypercoagulability (defined as clot strength > 95% confidence interval value of normal subject plasma), and COHF formation (determined with a thrombelastograph-based assay). Plasma obtained from commercially available normal subjects (N = 30) was used for comparison with brain tumor patient samples.

RESULTS: Brain tumor patients had carboxyhemoglobin concentrations of 1.5% ± 0.5% (mean ± SD), indicative of HO-1 upregulation. Compared with normal subject plasma, brain tumor patient plasma had significantly ($P < 0.0001$) greater clot formation velocity (5.2 ± 1.5 vs 9.5 ± 2.3 dynes/cm/s, respectively) and significantly ($P = 0.00016$) stronger final clot strength (166 ± 28 vs 230 ± 78 dynes/cm, respectively). Ten of the brain tumor patients had plasma clot strength that exceeded the 95% confidence interval value observed in normal subjects, and 12 of the brain tumor patients had COHF formation. Five of the brain tumor patients in the hypercoagulable subgroup had COHF formation. Last, 5 of the hypercoagulable patients had primary brain tumors, whereas the other 5 patients had metastatic tumors or an inflammatory mass lesion.

CONCLUSIONS: A subset of patients with brain tumors has increased endogenous CO production, plasmatic hypercoagulability, and COHF formation. Future investigation of the role played by HO-1 derived CO in the pathogenesis of brain tumor-associated thrombophilia is warranted.

右美托咪定減少腦電雙頻指數引導下閉環麻醉過程中丙泊酚和瑞芬太尼的用量：一項雙盲安慰劑對照試驗

Dexmedetomidine Reduces Propofol and Remifentanil Requirements During Bispectral Index-Guided Closed-Loop Anesthesia: A Double-Blind, Placebo-Controlled Trial

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Anesthesia & Analgesia 2014 118 946–955

背景：α2-受體選擇性激動劑右美托咪定被用作麻醉輔助用藥。因此，此項研究試圖確定在何種情況下，右美托咪定可以減少丙泊酚和瑞芬太尼的用量。

方法：這項雙盲隨機對照研究（註冊號 00921284）使用一個自動化閉環管理保持腦電雙頻指數在 40 和 60 之間。66 名 ASA I 和 II 級患者給予右美托咪定（在手術中給予 1ug/kg 超過 10 分鐘的，連續輸注 0.5ug/kg/h）或者同等劑量的的生理鹽水作爲安慰劑。丙泊酚和瑞芬太尼用量採用非參數核對總和中位數（四分位數）的方法比較。

結果：每組中有 28 名患者完成了此項研究，在麻醉誘導中，右美托咪定組患者需要較少的丙泊酚（1.0 [0.7-1.3] vs 1.3 [1.0-1.7] mg/kg, P=0.002）和瑞芬太尼 (1.2 [1.0-1.4] vs 1.6 [1.1-2.8] μg/kg, P = 0.02)。麻醉維持過程中，右美托咪定組(2.2 [1.5-3.0] vs 3.1 [2.4-4.5] mg/kg/h, P = 0.005)患者需要較少劑量丙泊酚 29%（95%可信區間，18-40），而瑞芬太尼

劑量無明顯差異(0.16 [0.09-0.17] vs 0.14 [0.13-0.21] μg/kg/h ，P = 0.3)。右美托咪定組患者術後首次嗎啡鎮痛的請求出現延遲（中位數爲第四小時和一小時，P=0.008）。

結論：右美托咪定可以有效減少麻醉誘導過程中丙泊酚和瑞芬太尼劑量，以及減少麻醉維持過程中丙泊酚的使用量。同時，右美托咪定也可以延緩術後鎮痛藥的使用。右美托咪定是一種有效的輔助用藥，可以用於減少麻醉藥的使用量以及術後鎮痛。

（董 靜 譯　李士通 校）

BACKGROUND: The α2-adrenergic agonist dexmedetomidine is a sedative and can be used as an adjunct to anesthetics. Our primary goal was thus to determine the extent to which dexmedetomidine reduces the requirement for propofol and remifentanil.

METHODS: This double-blinded, randomized study (NCT00921284) used an automated dual closed-loop administration to maintain the Bispectral Index between 40 and 60. Sixty-6 ASA physical status I and II patients were given either dexmedetomidine (1 μg/kg over 10 minutes followed by a continuous infusion of 0.5 μg/kg/h throughout surgery) or comparable volumes of saline as a placebo. Propofol and remifentanil requirements were compared using nonparametric tests and expressed as medians (interquartile ranges).

RESULTS: Twenty-eight patients in each group completed the study. Patients given dexmedetomidine required less propofol (1.0 [0.7-1.3] vs 1.3 [1.0-1.7] mg/kg, P = 0.002) and remifentanil (1.2 [1.0-1.4] vs 1.6 [1.1-2.8] μg/kg, P = 0.02) for anesthetic induction. The propofol dosage required for anesthetic maintenance was 29% (with a 95% confidence interval, 18-40) lower in patients given dexmedetomidine (2.2 [1.5-3.0] vs 3.1 [2.4-4.5] mg/kg/h, P = 0.005), whereas the remifentanil dosage was not significantly different (0.16 [0.09-0.17] vs 0.14 [0.13-0.21] μg/kg/h with P = 0.3). The incidence of adverse events, including hemodynamic instability and delayed recovery, was comparable with and without dexmedetomidine. The first postoperative request for morphine analgesia was delayed in patients given dexmedetomidine (median fourth hour vs first hour, P = 0.008).

CONCLUSIONS: Dexmedetomidine administration significantly reduced the requirement for both propofol and remifentanil during anesthetic induction and reduced propofol use during maintenance of anesthesia. Dexmedetomidine also delayed postoperative analgesic use. Dexmedetomidine is a useful adjuvant that reduces anesthetic requirement and provides postoperative analgesia.

老年患者行髖關節骨折修復術的生存率與脊椎麻醉下鎮靜深度的關係

Sedation Depth During Spinal Anesthesia and Survival in Elderly Patients Undergoing Hip Fracture Repair

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Anesthesia & Analgesia 2014 118 977–980

摘要：術中腦電雙頻譜指數降低（Bispectral Index, BIS）可能與患者的死亡率增加有關。在一項預防譫妄的試驗中，我們將在脊椎麻醉下進行髖關節骨折修復術的患者隨機分爲兩組：輕度鎮靜（BIS>80）和深度鎮靜（BIS 約 50），並分析了試驗中患者的生存率情況。在所有患者中，兩組的死亡率沒有顯著性差異。然而，在合併嚴重併發症的患者中（Charlson 評分>4），輕度鎮靜組 1 年死亡率（22.2%）比深度鎮靜組 1 年死亡率（43.6%）低（風險比爲 0.43，95%可信區間爲 0.19-0.97，P=0.04）。在 Charlson 評分>6 分的患者中也顯示出類似結果，脊椎麻醉下輕度鎮靜組 1 年死亡率（28.6%）比深度鎮靜組 1 年死亡率（52.6%）低（風險比爲 0.33，95%可信區間爲 0.12-0.94，P=0.04）。脊椎麻醉中輕度鎮靜是否可以降低此類患者死亡率還需要進一步研究。

（盛嘉君 譯，李士通 審校）

Low intraoperative Bispectral Index (BIS) values may be associated with increased mortality. In a previously reported trial to prevent delirium, we randomized patients undergoing hip fracture repair under spinal anesthesia to light (BIS >80) or deep (BIS approximately 50) sedation. We analyzed survival of patients in the original trial. Among all patients, mortality was equivalent across sedation groups. However, among patients with serious comorbidities (Charlson score >4), 1-year mortality was reduced in the light (22.2%) vs deep (43.6%) sedation group (hazard ratio [HR], 0.43; 95% confidence interval, 0.19-0.97; P = 0.04) during spinal anesthesia. Similarly, among patients with Charlson score >6, 1-year mortality was reduced in the light (28.6%) vs deep (52.6%) sedation group (HR 0.33; 95% confidence interval, 0.12-0.94; P = 0.04) during spinal anesthesia. Further research on reduced mortality after light sedation during spinal anesthesia is needed.

剖宮產後新生兒低體溫的發生率及其預防措施隨機對照試驗

The Incidence and Prevention of Hypothermia in Newborn Bonding after Cesarean Delivery: A Randomized Controlled Trial

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Anesthesia & Analgesia 2014 118 997–1002

背景：剖宮產後產婦與新生兒的體溫調節情況尚未完全清楚。新生兒低體溫併發症嚴重，因此應該儘量避免。本實驗研究新生兒低體溫是否發生在手術中或是產後母嬰接觸時，同時研究在 20 分鐘的手術過程中積極應用加溫措施對母嬰的影響。

方法：選擇擬行腰麻下剖宮產術產婦 40 例。所有的產婦和其新生兒隨機分爲兩組，在整個手術過程中及產後的母嬰接觸過程中一組接受被動性絕熱，另一組進行充氣溫毯皮表加溫。結果主要記錄母嬰接觸末的新生兒核心溫度，由直腸探測儀測得；產婦體溫是指舌下溫度。同時還觀察記錄產婦的皮膚溫度，熱舒適度以及圍術期寒顫的發生。

結果：術中及產後未予加溫組，平均核心體溫下降到了 35.9 (0.6)℃。21 個新生兒中有 17 個（87%）出現了低體溫（低於 36.5℃）。積極皮表加溫組，平均核心體溫爲 37.0 (0.2)℃，且新生兒低體溫的發生率降低了，19 個新生兒中只發生 1 例（5%）(P < 0.0001)。另外，術中積極的加溫升高了嬰兒皮膚溫度、母親的核心溫度、皮膚溫度和熱舒適度；降低了產婦圍術期寒顫的發生。

結論：對剖宮產後母嬰予以充氣溫毯加溫可降低母嬰低體溫和產婦寒顫的發生率，增加產婦圍術期的熱舒適度。

（王慧娟 譯 李士通 校）

BACKGROUND: Little is known about thermoregulation of the newborn while bonding on the mother's chest immediately after cesarean delivery. Newborn hypothermia is associated with serious complications and should be avoided. Therefore, we evaluated whether newborns develop hypothermia during intraoperative bonding while positioned on their mothers' chests and investigated the effects of active cutaneous warming of the mothers and babies during a 20-minute intraoperative bonding period.

METHODS: We enrolled 40 parturients scheduled for elective cesarean delivery under spinal anesthesia. Mothers and their newborns were randomized to receive either passive insulation or forced-air skin-surface warming during the surgical procedure and bonding period. The primary outcome was neonatal core temperature at the end of the bonding period. Core temperatures of the newborns were measured with a rectal probe. Body temperatures of the mothers were assessed by sublingual measurements. Skin temperatures, thermal comfort of the mothers, and perioperative shivering were evaluated.

RESULTS: Without active warming from the beginning of the surgical procedure until the end of the bonding period, the mean (SD) neonatal core temperature decreased to 35.9 (0.6)℃. Seventeen of 21 (81%) newborns became hypothermic (defined as a core temperature below 36.5℃). Active skin-surface warming from the beginning of the surgical procedure until the end of the bonding period resulted in a neonatal core temperature of 37.0 (0.2)℃ and a decreased incidence of hypothermia (1 of 19 (5%) newborns ($P < 0.0001$)). In addition, active warming increased the mean skin temperatures of the infants, maternal core and skin temperatures, maternal thermal comfort, and reduced perioperative shivering.

CONCLUSIONS: Active forced-air warming of mothers and newborns immediately after cesarean delivery reduces the incidence of infant and maternal hypothermia and maternal shivering, and increases maternal comfort.

評估兒科常用的以年齡估算體重公式的精確性

Assessing the Accuracy of Common Pediatric Age-Based Weight Estimation Formulae

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Anesthesia & Analgesia 2014 118 1027–1033

背景：估計兒童體重的許多常用公式在兒童肥胖普遍流行前應用或者在超重的兒童沒有進行評估。因此，我們評估了三個常用的以年齡體重評估公式（Advanced Pediatric Life Support, Luscombe, and Theron）來估計進行擇期，非心臟手術的兒童體重。我們也形成和驗證了一個新的以年齡計算體重的公式。

方法：我們選取了年齡從 2-12 歲 13933 名兒童的術前人工測量的和臨床資料來評估這三個估計公式的應用。在一項佇列研究評估這種公式估計體重的能力（從研究樣本中隨機抽取 75%）。我們也形成及驗證了一種新的估計公式（Michigan 公式)來評估現在美國兒童的體重。

結果：在同組的 10488 名兒童中，31.8%是超重或肥胖而 55.7%是男孩。公式的精確性差異很大。Luscombe 公式證明最少的偏差是 3.4kg（95%CI3.2-3.5kg），89.7%預測值符合測量值的 10%。我們衍生的線性回歸方程式證明與已存在的公式相比最高精確度的偏差爲 4.6kg（95%CI4.36-4.84kg

）並且 92%預測值符合測量值的 10%。

結論：現在的體重估計公式的精確性變化很大。我們衍生出的方程式（Michigan=3x 年齡+10）證明與已存在的公式有高的精確性，並且可能更適合於現代美國兒童的體重計算。

（王曉莉譯 李士通校）

BACKGROUND: Many of the common equations for weight estimation in children were either introduced before the widespread prevalence of childhood obesity or have not been assessed in overweight/obese children. Therefore, we assessed the accuracy of 3 common age-based weight estimation formulae (Advanced Pediatric Life Support, Luscombe, and Theron) for predicting the weight of children undergoing elective, noncardiac operations. We also developed and validated a new age-based weight estimation formula.

METHODS: We used preoperative anthropometric and clinical data on 13,933 children aged 2 to 12 years to evaluate the performance of 3 pediatric age-based weight estimation formulae. Ability of the formulae to predict measured weights was assessed in a derivation cohort (75% randomly selected from the study sample). We also developed and validated a new age-based formula (the Michigan formula) that could be used to estimate the weight of contemporary American children.

RESULTS: Among the 10,488 children in the derivation cohort, 31.8% were overweight or obese while 55.7% were boys. The accuracy of the formulae varied considerably. The Luscombe formula demonstrated the lowest mean bias of 3.4 kg (95% confidence interval, 3.2-3.5 kg) and 89.7% of estimates within 10% of measured weight. Our derived linear regression equation the "Michigan Formula" demonstrated the highest accuracy compared with the existing formulae with a bias of 4.6 kg (95% confidence interval, = 4.36-4.84 kg) and 92% of estimates within 10% of measured weights.

CONCLUSIONS: Accuracies of current weight estimation formulae varied greatly. Our derived equation (Michigan formula: weight (kg) = 3 x age (yr) + 10) demonstrated high accuracy when compared with existing formulae and may be more applicable for estimating the weight of contemporary American children.

術前患者來自住院或門診預約對總手術取消時間的相對影響

Relative Influence on Total Cancelled Operating Room Time from Patients Who Are Inpatients or Outpatients Preoperatively

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Anesthesia & Analgesia 2014 118 1072–1080

背景：在之前的研究中，醫院手術室時間表很明顯的受到手術前幾天所做決定的影響。最起碼有一半的手術室接受在術前 2 天內最後的時間計畫及變動。在最近的研究中，我們研究了是否這些改動是歸咎於這些術前即收住院的患者。我們區分了“住院病人”與接受門診手術或預約手術時間的“門診病人”。

方法：從全美的 21 家非教學醫院的健康系統中，調查了 5 家健康機構的爲期 8 周的取消資料。同樣觀測了 8 家教學醫院的爲期 13 周的取消資料，包括具體的每一件案例的完整的計畫/重計畫/取消的具體執行的時間節點。

結果：（1）在非教學醫院的健康體系中，門診病人中的計畫分鐘的 1.6% ± 0.1% (SEM)被取消，同時在住院病人中達到了 8.1% ± 0.4%。因此，儘管住院病人陳述手術時間遠小於一半手術計畫時間（6.2% ± 0.5%, P < 0.0001）,但是他們面臨將近一半的總取消時間（全部 P = 0.55, 49% ± 2%; 醫院只有 P = 0.062, 57% ± 3%）。（2）在非教學醫院中，隨著門診病人規律術前門診隨訪的的的出勤率每 10%的上升，可以觀測到取消時間的每 0.0% ± 0.1%的確切的下降（P = 0.58）（3）在教學醫院，住院病人有 22.3% ± 0.4%時在計畫分鐘內的，而大部分是取消分鐘的（70% ± 2%, P < 0.0001）。半數剛過的住院病人的取消分鐘主要歸咎於手術是術前一天才決定的（例如，週五決定週一，週一決定週二）。在這個時間內，住院病人的取消率，以分鐘計算，是門診病人的好幾倍（P < 0.0001）。

結論：醫療機構可以達到≤2%的門診病人的術前取消率，事實上使用了電話隨訪，而很少人看了術前門診。在健康系統中至少一半的取消時間來自于住院病人，這些人按照原則在術前一天或者手術當天才予以計畫。這是手術室時間表在術前一天或者手術當日出現這麼多變化的原因。醫院應該評價住院病人的更早評估的成本效用。另外，計畫部門對於術前一天的手術計畫應該基於包括對取消的風險及另加手術的風險的預告數據。醫院應該對這種行爲的圍手術期管理加強監控。

（王贇譯 李士通校）

BACKGROUND: In previous studies, hospitals' operating room (OR) schedules were influenced markedly by decisions made within a few days of surgery. At least half of ORs had their last case scheduled or changed within 2 working days of surgery. In the current investigation, we studied whether many of these changes were due to patients who were admitted

before surgery. We differentiated these "inpatients" from "outpatients" having ambulatory surgery or admitted on the day of surgery.

METHODS: From 21 facilities of a nonacademic health system throughout the United States, N = 5 eight-week periods of cancellation data were obtained. From an academic hospital, N = 8 thirteen-week periods of cancellation data were obtained, including detailed audit data with timestamps of the entire scheduling/rescheduling/cancellation history for each case.

RESULTS: (1)In the non-academic health system, outpatients accounted for 1.6% ± 0.1% (SEM) of the scheduled minutes that were cancelled, whereas inpatients accounted for 8.1% ± 0.4%. Consequently, even though inpatients represented much less than half the total scheduled minutes of surgery (16.2% ± 0.5%, P < 0.0001), they accounted for approximately half of the total cancelled minutes (overall P = 0.55, 49% ± 2%; hospitals only P = 0.062, 57% ± 3%). (2) In the nonacademic health system, each 10% increase in a facility's percentage of outpatients making a physical visit to a preoperative clinic (versus only a preoperative phone call) was associated with a 0.0% ± 0.1% absolute decrease in cancelled minutes (P = 0.58). (3) In the academic hospital, inpatients accounted for 22.3% ± 0.4% of the scheduled minutes but most of the total cancelled minutes (70% ± 2%, P < 0.0001). Slightly more than half the total inpatient cancelled minutes (54% ± 1%, P = 0.006) were due to cases scheduled within 1 workday prior to the day of surgery (e.g., Friday for Monday, Monday for Tuesday). During this period, inpatient cancellation rates, measured in minutes, were several-fold larger than outpatient rates (P < 0.0001).

CONCLUSIONS: Facilities can achieve a ≤2% cancellation rate for patients who are outpatient preoperatively with very few attending a preoperative clinic, when a virtual evaluation is carried out by phone. At least half of the cancelled time at health systems and hospitals is attributable to inpatients, and these patients principally are scheduled within 1 workday of the day of surgery. This is why there are so many changes to the OR schedule within 1 workday before the day of surgery. Hospitals should evaluate the cost-effectiveness of earlier assessments of inpatients. In addition, scheduling office decision-making within 1 workday before surgery should be based on statistical forecasts that include the risks of cancellation and of inpatient add-on cases being scheduled. Hospitals should monitor the performance of their perioperative managers with respect to such behavior.

糖皮質激素對神經病理性疼痛的作用：著重回顧鞘內注射甲基強的松龍

The Effects of Glucocorticoids on Neuropathic Pain: A Review with Emphasis on Intrathecal Methylprednisolone Acetate Delivery

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Anesthesia & Analgesia 2014 118 1097–1112

摘要：甲基強的松龍（MPA）在坐骨神經疼痛和其他神經病理性疼痛中有很長的治療歷史。在治療這些症狀時，MPA 主要用於硬膜外腔給藥，而鞘內注射只用在有限的患者身上，如帶狀皰疹後遺神經痛和複雜性區域疼痛綜合征患者。神經病理性疼痛患者鞘內注射 MPA 的療效仍有爭議，而且其安全性仍也被質疑。在這篇綜述中，我們廣泛探討了糖皮質激素對神經損傷和炎症導致的疼痛脊髓級聯反應的作用。並進一步著重探討了 MPA 在鞘內給藥時的藥代動力學，有效性和安全性特徵。

（楊斌譯 李士通校）

Methylprednisolone acetate (MPA) has a long history of use in the treatment of sciatic pain and other neuropathic pain syndromes. In several of these syndromes, MPA is administered in the epidural space. On a limited basis, MPA has also been injected intrathecally in patients suffering

from postherpetic neuralgia and complex regional pain syndrome. The reports on efficacy of intrathecal administration of MPA in neuropathic pain patients are contradictory, and safety is debated. In this review, we broadly consider mechanisms whereby glucocorticoids exert their action on spinal cascades relevant to the pain arising after nerve injury and inflammation. We then focus on the characteristics of the actions of MPA in pharmacokinetics, efficacy, and safety when administered in the intrathecal space.

急診手術和日間手術患者術前停用 ACEI/ARB 類藥物後高血壓的風險評估

The risk of hypertension after preoperative discontinuation of Angiotensin-converting enzyme inhibitors or Angiotensin receptor antagonists in ambulatory and same-day admission patients.

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Anesthesia & Analgesia 2014 118 938–944

背景：已有報導稱術前持續使用 ACEI/ARB 類藥物與術中對升壓藥物無反應的低血壓相關。因此，一些研究者建議術前應停用該類藥物，但是尚無關於停藥後不良後果的報導。我們組織了一個前瞻性，單盲，隨機試驗來觀察這類藥物對術前動脈血壓的作用。入選包括急診手術和日間手術的患者。

方法：前瞻性地入選 2006 年至 2011 年間 644 名急診手術和日間手術的患者，根據是否持續服用 ACEI/ARB 類藥物隨機分成 2 組。使用了意向性治療分析。主要終點是術前立即出現高血壓。次要終點包括因高血壓手術取消，住院時間延長，不良臨床事件和術後高血壓。

結果：最終分析了 526 名患者的資料。其中 262 名爲不持續服用 ACEI/ARB 類藥物，264 名爲持續服用的患者。手術當天不服用 ACEI/ARB 類藥物與術前高血壓的發病率無關（P=0.775）。研究組中 1 級和 2 級高血壓的不同發病率的 95%置信區間（CI）的上界顯示，停用 ACEI/ARB 類藥物似與 1 級高血壓發病率無關（>4.8%），與 2 級高血壓發病率亦無關（>5.8%）。停用 ACEI/ARB 類藥物與術後高血壓發病率增高、住院時間延長、不良臨床事件發生無關。

結論：手術當天停用 ACEI/ARB 類藥物與持續服用藥物相比，事實上並不增加圍術期高血壓的發病率。研究結果爲手術當天停用藥物提供了基礎研究證據，說明其並不增加血液動力學不良事件。

(陳實玉譯 薛張綱校)

BACKGROUND: The continued use of angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin II subtype I receptor antagonists (ARBs) medications in the preoperative period has been reported to be associated with intraoperative hypotension that can be unresponsive to pressor drugs. As a result, several investigators suggested discontinuation of these medications before scheduled surgery but did not report on unintended consequences that might result from discontinuation. We conducted a prospective, single-blind, randomized trial to observe the effect of the medications on preoperative arterial blood pressure recordings in patients presenting for ambulatory and same-day surgery.

METHODS: Six hundred forty-four patients presenting for ambulatory and same-day surgery were enrolled prospectively between 2006 and 2011 and randomly assigned to 2 groups based on continuation or discontinuation of ACEIs and ARBs. An intention-to-treat analysis was performed. The primary outcome was presence of hypertension (HTN) immediately before

surgery. Secondary outcomes included surgical cancellations due to HTN, prolongation of hospitalization, adverse clinical events, and HTN in the postoperative period.

RESULTS: Data for 526 patients were analyzed. There were 262 patients in the discontinuation group and 264 patients in the continuation group. Discontinuation of ACEIs and ARBs on the day of surgery was not associated with increased prevalence of preoperative HTN (P = 0.775). The upper bound of a 95% confidence interval for the difference in prevalence of Stage 1 and 2 HTN between study arms indicates that discontinuation of study medication is unlikely to be associated with an increase in Stage 1 HTN of >4.8 percentage points and in Stage 2 HTN of no >5.8 percentage points. Discontinuation was not associated with an increase in postoperative HTN, with prolongation of hospitalization or with adverse clinical events.

CONCLUSIONS: Discontinuing ACEIs and ARBs in patients on the day of surgery did not result in a substantively increased incidence of pre- or postoperative HTN compared with patients who continued these medications on the day of surgery. The results provide an evidentiary basis for the safety of discontinuing ACEIs and ARBs on the day of surgery without increasing adverse hemodynamic outcomes.

在結直腸手術患者的目標導向液體治療中無創心輸出量與食管多普勒監測的前瞻性對比

A prospective comparison of a noninvasive cardiac output monitor versus esophageal Doppler monitor for goal-directed fluid therapy in colorectal surgery patients.

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Anesthesia & Analgesia 2014 118 966–975

背景：目標導向液體治療（ GDFT ）與手術後改善預後有關。食管多普勒監測（ EDM）被廣泛使用，但也有一些局限性。NICOM ，一種完全無創心輸出量監測儀（Cheetah 醫療） ，可適當指導 GDFT 。目前尚沒有前瞻性研究比較 NICOM 和 EDM 對 GDFT 的指導。我們假設， NICOM 在指導 GDFT 中與 EDM 無顯著差別。

方法：100 位成年擇期結直腸手術患者參加了這項研究。在第一研究組中的患者（ N = 50 ）在術中 GDFT 由 EDM 引導，而 NICOM 被連接，在第二研究組中的患者（ N = 50 ）在術中 GDFT 由 NICOM 引導，而 EDM 被連接。用 250 毫升膠體每個病人的每搏輸出量進行了優化。研究對兩種測量方式的資料進行了評估；並對患者的治療效果（術後疼痛，噁心，腸功能恢復），併發症（腎，肺，感染和傷口併發症）和住院時間（ LOS）進行比較。

結果：使用增加 10%心搏量液體優化後，兩種測量方式的資料變化分別是 5 分鐘 60 %，10 分鐘 61 %， 15 分鐘 66 %，在任何時間點無顯著系統性的分歧（ McNemar P> 0.05 ）。相比 NICOM，EDM 有顯著更多的丟失的資料。沒有臨床中發現總 LOS 或其他成果顯著差異。平均住院天數分別爲組一 6.56 ±4.32 天，組二 6.07 ±2.85 天，差異 95 %可信限分別爲-0.96 至 1.95 天（ P = 0.5016 ） 。

結論：NICOM 在指導 GDFT 中與 EDM 相似 ，結果上沒有顯著臨床差異，並且其使用方便且資料丟失較少。該 NICOM 可能是一個可選擇的指導 GDFT 的監測方法。

（陳婉南譯 薛張綱校）

BACKGROUND: Goal-directed fluid therapy (GDFT) is associated with improved outcomes after surgery. The esophageal Doppler monitor (EDM) is widely used, but has several limitations. The NICOM, a completely noninvasive cardiac output monitor (Cheetah Medical), may be

appropriate for guiding GDFT. No prospective studies have compared the NICOM and the EDM. We hypothesized that the NICOM is not significantly different from the EDM for monitoring during GDFT.

METHODS: One hundred adult patients undergoing elective colorectal surgery participated in this study. Patients in phase I (n = 50) had intraoperative GDFT guided by the EDM while the NICOM was connected, and patients in phase II (n = 50) had intraoperative GDFT guided by the NICOM while the EDM was connected. Each patient's stroke volume was optimized using 250-mL colloid boluses. Agreement between the monitors was assessed, and patient outcomes (postoperative pain, nausea, and return of bowel function), complications (renal, pulmonary, infectious, and wound complications), and length of hospital stay (LOS) were compared.

RESULTS: Using a 10% increase in stroke volume after fluid challenge, agreement between monitors was 60% at 5 minutes, 61% at 10 minutes, and 66% at 15 minutes, with no significant systematic disagreement (McNemar $P > 0.05$) at any time point. The EDM had significantly more missing data than the NICOM. No clinically significant differences were found in total LOS or other outcomes. The mean LOS was 6.56 ± 4.32 days in phase I and 6.07 ± 2.85 days in phase II, and 95% confidence limits for the difference were -0.96 to +1.95 days ($P = 0.5016$).

CONCLUSIONS: The NICOM performs similarly to the EDM in guiding GDFT, with no clinically significant differences in outcomes, and offers increased ease of use as well as fewer missing data points. The NICOM may be a viable alternative monitor to guide GDFT.

ASA 分級與其他術後 ICU 危險分層的聯繫

The Association Between ASA Status and Other Risk Stratification Models on Postoperative Intensive Care Unit Outcomes

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Anesthesia & Analgesia 2014 118 989–994

背景：關於術後危險分層方法與 SICU 轉歸之間聯繫的文獻報導較少。我們的假設主張常規的評估如 ASA 身體狀態評估，美國心臟協會指南定義的外科風險，簡易 SRCI 評分與 SICU 轉歸密切相關。

方法：我們用表格回顧了 2010 年 10 月 1 日至 2011 年 3 月 1 日進入 SICU 的病人。我們收集了病人一般情況和術後臨床資料：年齡，性別，ASA 病人體質狀況和手術風險評估，以及 SRCI 評分。結點數據包括我們初設的終結點，SICU 停留時間，以及第二終點：機械通氣和血管活性藥物使用時程，獲得性器官功能障礙的數量，7 天內再入 ICU，SICU 內死亡，以及 30 天內死亡。我們應用回歸分析和無參數統計，P 小於 0.05 表示有很大差異。

結果：我們一共監測了 239 名病人，其中有 220 名進入本研究組研究範圍。病人的平均年齡爲 58±16 歲。其中有 32%的急診手術病人，5%的 7 天內再入院至 SICU。SICU 死亡率及 30 天死亡率爲 3.2%.在 SICU 住院時間（2.9 ± 2.1 vs 5.9 ± 7.4, P = 0.007），呼吸機輔助通氣（0.9 ± 2.0 vs 3.4 ± 6.8, P = 0.01）和基於 ASA 分級（≤ 2 vs ≥ 3）的獲得性器官功能障礙數（0 [0-2] vs 1 [0-5], P < 0.001）等因素有顯著差異。同 ASA 分級明顯相關的混合因素：SICU 住院時間（意外發生比例 [IRR] = 1.79, 95% 置信區間[CI], 1.35-2.39, P < 0.001），呼吸機輔助通氣（IRR = 2.57, 95% CI, 1.69-3.92, P < 0.001），血管加壓藥物治療（IRR = 3.57, 95% CI, 1.84-6. 94, P < 0.001），獲得性器官功能障礙數（IRR = 1.71, 95% CI, 1.46-1.99, P < 0.001），和再次收治 ICU（發生率= 3.39, 95% CI, 1.04-11.09, P =

0.04）。我們發現外科手術風險和獲得性器官功能障礙數有著顯著相關性。SRCI 同 SICU 的治療結果則無明顯相關性。

結論：我們的研究揭示了 ASA 分級同延長 SICU 住院時間，呼吸機輔助通氣，血管加壓藥物治療的持續時間，獲得性器官功能障礙數，及再次收治 ICU 等相關；外科手術風險同獲得性器官功能障礙數相關。

（蔣鑫梅譯 薛張綱校）

BACKGROUND:There is limited medical literature investigating the association between perioperative risk stratification methods and surgical intensive care unit (SICU) outcomes. Our hypothesis contends that routine assessments such as higher ASA physical status classification, surgical risk as defined by American College of Cardiology/American Heart Association guidelines, and simplified Revised Cardiac Index (SRCI) can reliably be associated with SICU outcomes.

METHODS:We performed a chart review of all patients 18 years or older admitted to the SICU between October 1, 2010, and March 1, 2011. We collected demographic and preoperative clinical data: age, sex, ASA physical status class, surgical risk, and SRCI. Outcome data included our primary end point, SICU length of stay, and secondary end points: mechanical ventilation and vasopressor treatment duration, number of acquired organ dysfunctions (NOD), readmission to the intensive care unit (ICU) within 7 days, SICU mortality, and 30-day mortality. Regression analysis and nonparametric tests were used, and $P < 0.05$ was considered significant.

RESULTS:We screened 239 patients and included 220 patients in the study. The patients' mean age was 58 ± 16 years. There were 32% emergent surgery and 5% readmissions to the SICU within 7 days. The SICU mortality and the 30-day mortality were 3.2%. There was a significant difference between SICU length of stay (2.9 ± 2.1 vs 5.9 ± 7.4, $P = 0.007$), mechanical ventilation (0.9 ± 2.0 vs 3.4 ± 6.8, $P = 0.01$), and NOD (0 [0-2] vs 1 [0-5], $P < 0.001$) based on ASA physical status class (≤ 2 vs ≥ 3). Outcomes significantly associated with ASA physical status class after adjusting for confounders were: SICU length of stay (incidence rate ratio [IRR] = 1.79, 95% confidence interval [CI], 1.35-2.39, $P < 0.001$), mechanical ventilation (IRR = 2.57, 95% CI, 1.69-3.92, $P < 0.001$), vasopressor treatment (IRR = 3.57, 95% CI, 1.84-6. 94, $P < 0.001$), NOD (IRR = 1.71, 95% CI, 1.46-1.99, $P < 0.001$), and readmission to ICU (odds ratio = 3.39, 95% CI, 1.04-11.09, $P = 0.04$). We found significant association between surgery risk and NOD (IRR = 1.56, 95% CI, 1.29-1.89, $P < 0.001$, and adjusted IRR = 1.31, 95% CI, 1.05-1.64, $P = 0.02$). SRCI was not significantly associated with SICU outcomes.

CONCLUSIONS:Our study revealed that ASA physical status class is associated with increased SICU length of stay, mechanical ventilation, vasopressor treatment duration, NOD, readmission to ICU, and surgery risk is associated with NOD.

一種超聲引導下兒科患者中橈動脈置管的新方法

A novel method for ultrasound-guided radial arterial catheterization in pediatric patients.

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Anesthesia & Analgesia 2014 118 1019–1026

背景：在兒科患者中即便可以超聲引導下行橈動脈置管，有時仍然會遇到困難。因此我們評估了置管的影響因素並且試驗了一種提高成功率的設計方案。

方法：評估的早期，我們對 102 名兒科患者進行了多因素 Logistic 回歸分析。因變數包括首次嘗試和整體的成功或失敗；變數包括收縮壓，體重，ASA 分級，21 三體綜合征，動脈直徑和橈動脈皮下深度(<2, 2-4, ≥4 mm)。使用 Kaplan-Meier 曲線與對數秩和 Dunn 檢驗來評價動脈皮下深度對置管成功率的影響。然後我們評價了 60 名置管成功的患者。這些患者隨機分爲皮下注射生理鹽水組和對照組，並且必要時，將動脈皮下深度從小於 2 毫米增加到 2 到 4 毫米。

結果：從多因素 Logistic 回歸分析中得出：動脈皮下深度在 2 到 4 毫米之間是首次嘗試和總體成功的重要獨立預測因數。對數秩檢測結果顯示：動脈皮下深度 2 到 4 毫米這一組的穿刺置管時間顯著短於其他兩組(2-4 vs <2 mm 組，P = 0.01 而 2-4 vs ≥4 mm 組，P < 0.001)；並且首次嘗試的成功率也較高(<2 [43.8%] vs 2-4 mm [76.9%], P = 0.02; 2-4 [76.9%] vs ≥4.0 mm [19.4%], P < 0.001),總體成功率也較高 (<2 [62.5%] vs 2-4 mm [89.7%], P = 0.04; 2-4 [89.7%] vs ≥4.0 mm [51.6%], P = 0.002). 皮下注射生理鹽水使動脈深度從小於 2 毫米變爲 2 至 4 毫米可以顯著縮短置管時間(P=0.002)，提高首次嘗試置管的成功率(注射生理鹽水[85.0%] vs <2 mm [30.0%], P < 0.001), 以及總體成功率(注射生理鹽水 [90.0%] vs <2 mm [55.0%], P = 0.02).

結論：當動脈皮下深度爲 2 至 4 毫米時，兒科患者超聲引導下橈動脈置管是一種快速可靠的方法。對於動脈位於皮下深度小於 2 毫米者，皮下注射生理鹽水使之深度變爲 2-4 毫米可以減少置管時間和提高成功率。

（淩曉敏譯 薛張綱校）

BACKGROUND: Radial arterial catheterization in pediatric patients is occasionally difficult despite ultrasound guidance. We therefore assessed the factors affecting catheterization and tested an intervention designed to improve its success.

METHODS: For initial assessment, we performed multiple logistic reg ression analyses using 102 pediatric patients. Dependent variables included first-attempt and overall success or failure; independent variables were systolic blood pressure, weight, ASA physical status, trisomy 21, arterial diameter, and subcutaneous depth of the radial artery (<2, 2-4, ≥4 mm). The effect of subcutaneous arterial depth on cannulation success was assessed using Kaplan-Meier curves with log-rank and Dunn tests. We then assessed catheterization success in 60 patients who were randomized to no treatment or subcutaneous saline injection, as necessary, to increase the subcutaneous arterial depth from <2 to 2 to 4 mm.

RESULTS: Subcutaneous arterial depth of 2 to 4 mm was derived as a significant independent predictor of initial and overall success from the multiple logistic regression analyses. The 2 to 4 mm group had a significantly shorter catheterization time compared with the other 2 groups in the log-rank test (2-4 vs <2 mm group; P = 0.01, 2-4 vs ≥4 mm group; P < 0.001), and higher success rate in the first attempt (<2 [43.8%] vs 2-4 mm [76.9%], P = 0.02; 2-4 [76.9%] vs ≥4.0 mm [19.4%], P < 0.001), and the overall attempt (<2 [62.5%] vs 2-4 mm [89.7%], P = 0.04; 2-4 [89.7%] vs ≥4.0 mm [51.6%], P = 0.002). Injecting subcutaneous saline to bring arterial depth from <2 mm to 2 to 4 mm significantly shortened catheterization time (P = 0.002), and improved the success rate in the first-attempt (saline injection [85.0%] vs <2 mm [30.0%], P < 0.001), and the overall attempt (saline injection [90.0%] vs <2 mm [55.0%], P = 0.02).

CONCLUSIONS : Ultrasound-guided radial artery catheterization in pediatric patients was fastest and most reliable when the artery was 2 to 4 mm below the skin surface. For arteries located <2 mm below the skin surface, increasing the depth to 2 to 4 mm by subcutaneous saline injection reduced catheterization time and improved the success rate.

瑞芬太尼在未成熟發育的小鼠大腦上的抗細胞凋亡效果：一個活體外研究

The antiapoptotic effect of remifentanil on the immature mouse brain: an exvivo study

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Anesthesia & Analgesia 2014 118 1041–1051

背景：在有潛在早產的情況下，瑞芬太尼麻醉的使用使我們探索了活體外阿片類藥物對未成熟小鼠大腦的影響。瑞芬太尼提高骨髓的谷氨酸能 N-甲基-D-天門冬氨酸受體的活性。此外，在新生鼠皮質中，NMDA 之前被證明會根據皮質層的不同而發揮興奮毒性或抗凋亡的作用。我們通過使用人工培植的腦片樣本，評估瑞芬太尼單獨或和甘氨酸載體（瑞芬太尼的商業準備，C.P. 瑞芬太尼）同時作用對未成熟大腦造成的潛在的壞死和凋亡影響。

方法：從出生後 2 天的小鼠腦片使用不同的化合物治療 5 小時，單獨孵化或者在 NMDA 存在時孵化。通過測量乳酸脫氫酶活性和氨基放線菌素 D 標號來研究其壞死效應。凋亡性死亡是通過免疫印跡和免疫組化，根據半胱氨酸蛋白酶-3 活性的測量值以及裂解的半胱氨酸蛋白酶-3 蛋白水準進行評價的。 外在和內在的凋亡途徑是通過測量的半胱氨酸蛋白酶-8，半胱氨酸蛋白酶-9 的活性，Bax 蛋白水準和線粒體完整性進行研究的。

結果：C. P. 瑞芬太尼對敗壞性死亡無效，然而它明顯降低了半胱氨酸天冬氨酸蛋白酶的活性以及皮質貼近的半胱氨酸天冬氨酸蛋白酶-3 標準。C.P.瑞芬太尼可抑制皮層的 Bax 蛋白質表達，半胱天冬酶-9 的活力以及保持線粒體的完整性，它對半胱天冬酶-8 的活性沒有影響。它的作用靶標是新皮層的表面層，並通過阿片樣物質受體拮抗劑納洛酮和 NMDA 拮抗劑 MK801 被翻轉。瑞芬太尼和甘氨酸協調作用以抑制細胞凋亡。此外，C.P. 瑞芬太尼增強了 NMDA 的抗凋亡作用，卻並沒有改善 NMDA 在腦片中的興奮毒性。

結論:當前資料表明，在超臨床濃縮上，C.P.瑞芬太尼沒有 pronecrotic 影響，但是對於未成熟小鼠大腦的細胞死亡活動的間接體內療法卻存在一定程度的影響，這包括阿片樣物質和 NMDA 受體，以及依賴於線粒體的凋亡通路。瑞芬太尼在腦損傷的活體新生小鼠模型中無論對細胞死亡的影響評估或是對測量其對於發展中的大腦的影響都是非常必要的。

(劉毅譯 薛張綱校)

BACKGROUND: The use of remifentanil in a context of potential prematurity led us to explore ex vivo the opioid effects on the immature mouse brain. Remifentanil enhances medullary glutamatergic N-methyl-D-aspartate (NMDA) receptor activity. Furthermore, in neonatal mouse cortex, NMDA was previously shown to exert either excitotoxic or antiapoptotic effects depending on the cortical layers. With the use of a model of acute cultured brain slices, we evaluated the potential necrotic and apoptotic effects of remifentanil, alone or associated with its glycine vehicle (commercial preparation of remifentanil, C.P. remifentanil), on the immature brain.

METHODS: Cerebral slices from postnatal day 2 mice were treated up to 5 hours with the different compounds, incubated alone or in the presence of NMDA. The necrotic effect was studied by measuring lactate dehydrogenase activity and 7-Aminoactinomycin D labeling. Apoptotic death was evaluated by measurement of caspase-3 activity and cleaved caspase-3 protein levels, using Western blot and immunohistochemistry. Extrinsic and intrinsic apoptotic pathways were investigated by measuring caspase-8, caspase-9 activities, Bax protein levels, and mitochondrial integrity.

RESULTS:C.P. remifentanil was ineffective on necrotic death, whereas it significantly reduced caspase-3 activity and cortical cleaved caspase-3 levels. C.P. remifentanil inhibited cortical Bax protein expression, caspase-9 activity, and preserved mitochondrial integrity, whereas it had no

effect on caspase-8 activity. Its action targeted the neocortex superficial layers, and it was reversed by the opioid receptors antagonist naloxone and the NMDA antagonist MK801. Remifentanil and glycine acted synergistically to inhibit apoptotic death. In addition, C.P. remifentanil enhanced the antiapoptotic effect of NMDA, whereas it did not improve NMDA excitotoxicity in brain slices.

CONCLUSION: The present data indicate that at a supraclinical concentration C.P. remifentanil had no pronecrotic effect but exerted ex vivo antiapoptotic action on the immature mouse brain, involving the opioid and NMDA receptors, and the mitochondrial-dependent apoptotic pathway. Assessment of the impact of the antiapoptotic effect of remifentanil in in vivo neonatal mouse models of brain injury will also be essential to measure its consequences on the developing brain.

在小鼠慢性擠壓損傷模型中孟魯司特減少神經疼痛通過抑制 P38 分裂素活化蛋白激酶和 KAPPA B 核因數

Montelukast Attenuates Neuropathic Pain Through Inhibiting p38 Mitogen-Activated Protein Kinase and Nuclear Factor-Kappa B in a Rat Model of Chronic Constriction Injury.

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Anesthesia & Analgesia 2014 118 1090–1096

背景：神經痛的產生涉及到半胱氨醯白三烯和其受體。我們的試驗研究孟魯司特的拮抗效應，其作爲半胱氨醯白三烯受體拮抗劑，抑制神經痛的效果及其機制。

方法：我們使用對小鼠坐骨神經的慢性擠壓損傷製造神經痛模型。造模之後，小鼠通過孟魯司特（0.5，1.0，和 2.0mg/kg 腹腔內注射，每天一次）干預 14 天。在手術前，造模後第 1，3，5，7，14 日應用機械刺激退縮閾值和熱刺激退縮時間評估小鼠。脊髓中的 IL-1B，IL-6,和 TNF-α 通過酶聯免疫試驗測定。通過 Westernblot 方法測定 P38 分裂素活化蛋白激酶的磷酸化及 NF-κB 的活化。星形膠質細胞標誌物神經膠質纖維酸蛋白和小神經膠質細胞標誌物 Iba-1 的表達，，P38 分裂素活化蛋白激酶的磷酸化和 Iba-1 的同表達，NF-κB 和 Iba-1 的共表達是通過螢光免疫檢驗法檢查的。

結果：造模組小鼠相比未處理對照組在 1，3，5，7，14 天時機械刺激退縮閾值及熱刺激退縮時間都明顯減少（P <0.05, P < 0.0001），應用孟魯司特干預組則明顯增加（P < 0.05, P < 0.01, P <0.0001）。在應用孟魯司特 14 日之後，脊髓中的炎症標誌物水準明顯低於單純造模組小鼠，其中 IL-1β (P < 0.0001), IL-6 (P = 0.001 低劑量組, P < 0.0001 中高劑量組), TNF-α (P =0.002 低劑量組, 0.001 中劑量組, < 0.0001 高劑量組)。Western blot 分析顯示孟魯司特提高了 p-p38 MAPK（P =0.006 低劑量組, 0.015 中劑量組, < 0.0001 高劑量組）和 NF-κB (P < 0.0001)在造模小鼠脊髓中的表達。螢光免疫法顯示孟魯司特能夠抑制慢性擠壓損傷造成的脊髓中的小神經膠質細胞活化，而不能抑制星形膠質細胞活化。同時，孟魯司特（2.0 mg/kg）能夠顯著減少 p38MAPK 和 Iba-1，NF-κBp65 和 Iba-1 的雙陽性細胞數。

結論：本研究顯示在慢性損傷致神經痛小鼠模型中孟魯司特能夠通過抑制脊髓中小神經膠質細胞的 p38MAPK 和 NF-κB 活化的信號通路從而有效減少神經痛。

（徐崢譯 薛張綱校）

BACKGROUND: Cysteinylleukotrienes and their receptors have been shown to be involved in the generation of neuropathic pain. We performed this study to determine the antagonistic effect

of montelukast, a cysteinylleukotrienes receptor antagonist, on neuropathic pain and its underlying mechanism.

METHODS: Neuropathic pain was induced by chronic constriction injury (CCI) of the sciatic nerve in rats. After CCI, rats were repeatedly administered montelukast (0.5, 1.0, and 2.0 mg/kg intraperitoneal, once daily) for a period of 14 days. Mechanical withdrawal threshold and thermal withdrawal latency were assessed before surgery and on days 1, 3, 5, 7, and 14 after CCI. The levels of interleukin (IL)-1β, IL-6, and tumor necrosis factor (TNF)-α in the spinal cord were determined by enzyme-linked immunosorbent assay. The phosphorylation of p38 mitogen-activated protein kinase (MAPK) and activation of nuclear factor-kappaB (NF-κB) were assessed by Western blot. The expression of astrocyte marker glial fibrillary acidic protein and microglia marker Iba-1 and the coexpression of p-p38MAPK and Iba-1 or NF-κB and Iba-1 were observed by immunofluorescent staining.

RESULTS: The CCI group displayed significantly decreased mechanical withdrawal threshold and thermal withdrawal latency on days 1, 3, 5, 7 and 14 compared with sham groups ($P < 0.05$, $P < 0.0001$), which were markedly increased by montelukast ($P < 0.05$, $P < 0.01$, $P < 0.0001$). After administration with montelukast for 14 days, as biological markers of inflammation, the levels of IL-1β ($P < 0.0001$), IL-6 ($P = 0.001$ for low dosage, $P < 0.0001$ for middle and high dosages), and TNF-α ($P = 0.002$, 0.001, < 0.0001 for low, middle, and high dosage, respectively) in the spinal cord were lower than those in the CCI group. Western blot analysis demonstrated that montelukast reduced the elevated expression of p-p38 MAPK ($P = 0.006$, 0.015, < 0.0001 for low, middle, and high dosage, respectively) and NF-κB ($P < 0.0001$) in the spinal cord induced by CCI. Immunofluorescent staining showed that montelukast could inhibit CCI-induced activation of microglia but not astrocytes in the spinal cord. In addition, montelukast (2.0 mg/kg) significantly decreased the number of p38MAPK and Iba-1 or NF-κBp65 and Iba-1 double-positive cells.

CONCLUSIONS: These results suggest that montelukast could effectively attenuate neuropathic pain in CCI rats by inhibiting the activation of p38MAPK and NF-κB signaling pathways in spinal microglia.

超聲引導下鎖骨上臂叢神經阻滯：單次與三次注射技術在上肢動靜脈瘺成形術的比較

Ultrasound-Guided Supraclavicular Brachial Plexus Block: Single Versus Triple Injection Technique for Upper Limb Arteriovenous Access Surgery

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Anesthesia & Analgesia 2014 118 1120–1125

背景：雖然超聲引導下鎖骨上臂叢神經阻滯具有良好的成功率，但目前尚不明確多次注射是否優於單次注射(SI)。因此我們比較了單次注射(SI)與三次注射(TI)的感覺阻滯成功率。

方法：在本項隨機雙盲研究中，將 96 例終末期腎病擬行動靜脈瘺成形術的患者隨機分組後，分別採用 SI 或 TI 方案進行神經阻滯。主要觀察指標爲注射 5，10，15，20 分鐘後，5 條神經的感覺阻滯綜合評分（正中神經，尺神經，橈神經，前臂內側皮神經和肌皮神經）。次要觀察指標是阻滯起效時間，操作時間（完成神經阻滯的時間），上述各神經的獨立成功率，手術麻醉的成功率，及併發症發生率。

結果：在注射 10，15，20 分鐘後，TI 組感覺阻滯綜合成功率較 SI 組高 20%至 31%(P<0.035)。在所有觀察時間點中，TI 組的肌皮神經阻滯均較 SI 組更快、更成功(P<0.026)。TI 組完成神經阻滯的平均操作時間較 SI 組顯著延長（分別爲 6.5±2.1 和 4.7±2.1 分鐘，P = 0.001）。兩組在 30 分鐘時的手術麻醉整體成功率並無顯著性差異（TI: 96%, SI: 87%, P=0.253）。

結論：單次注射的操作時間較短，而三次注射技術起效更快，且在前 20 分鐘對各神經的阻滯成功率更高。

（朱怡琦譯 薛張綱校）

BACKGROUND: Although ultrasound-guided supraclavicular block has a good success rate, it remains unclear whether multiple injections are superior to single injection (SI). We compared the sensory block success rate of SI versus triple injection (TI).

METHODS: In this randomized double-blind study, 96 end-stage renal disease patients undergoing arteriovenous fistula creation or superficialization were randomly allocated to receive either SI or TI. The primary outcome was the combined score of sensory blockade of the 5 nerves (median, ulnar, radial, medial cutaneous nerve of the forearm, and musculocutaneous) measured at 5, 10, 15, and 20 minutes after injection. Secondary outcome variables were the time to onset of the blockade, performance time (time to do the block), separate success rate for each of the above nerves, success rate of surgical anesthesia, and the complication rate.

RESULTS: The combined success of the sensory block was 20% to 31% higher in the TI group than in the SI group at 10, 15, and 20 minutes after injection (all P < 0.035). The block of the musculocutaneous nerve in the TI group was faster and more successful than in the SI group, at all time points (all P < 0.026). The average time needed to perform the block was significantly longer in the TI than the SI group (6.5 ± 2.1 vs 4.7 ± 2.1 minutes, P = 0.001). The overall success of surgical anesthesia measured at 30 minutes did not differ significantly between the 2 groups (96% in TI vs 87% in SI, P = 0.253).

CONCLUSIONS: Although the performance time of the SI technique was shorter, TI had a faster onset and resulted in a more successful block of all nerves in the first 20 minutes.