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創傷性出血的處理：目標導向初級治療概念

Trauma Bleeding Management: The Concept of Goal-Directed Primary Care

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Anesthesia & Analgesia 2014 119 1064–1073

早期並積極大量使用新鮮冰凍血漿，濃縮血小板和紅細胞 s (RBCs)及比率主導的大量輸血方案，已頻繁用於治療創傷後凝血障礙和失血性休克。然而最佳紅細胞比：新鮮冰凍血漿和紅細胞與濃縮血小板的比值仍然處於探究中。在一些歐洲創傷中心，諸如濃縮纖維蛋白原、凝血酶原複合物和抗纖溶藥物等止血藥成爲目標導向大量輸血方案中不可或缺的成分。比率導向的凝血治療和基於凝血因數濃度的床旁指導凝血管理均針對同一目標——即快速防治休克和凝血功能障礙以避免因創傷性出血導致的死亡。此文比較了以比率和目標爲導向的創傷後凝血障礙方案的有效性和安全性相關證據，以期對兩種治療策略相關的潛在優缺點引起重視。

（潘志敏 譯 陳傑 校）

The early and aggressive high-volume administration of fresh frozen plasma, platelet concentrates, and red blood cells (RBCs), using ratio-driven massive transfusion protocols, has been adopted by many for the treatment of trauma-induced coagulopathy and hemorrhagic shock. However, the optimal ratio of RBC: fresh frozen plasma and RBC:platelet concentrate is still under investigation. In some European trauma centers, hemostatic agents such as fibrinogen concentrate, prothrombin complex concentrates, and antifibrinolytics are integral parts of goal-directed massive transfusion protocols. Both a ratio-driven coagulation therapy and a point-of-care–guided coagulation management based on coagulation factor concentrates aim for the same target—the rapid prevention and treatment of shock and coagulopathy to prevent death from traumatic hemorrhage. In this review, we compare the evidence relating to the effectiveness and safety of the ratio-driven and goal-directed approaches to trauma-induced coagulopathy to draw attention to the potential benefits and drawbacks associated with these management strategies.

嚴重肥胖手術病人胃部超聲檢查：一項可行性研究

Gastric Sonography in the Severely Obese Surgical Patient: A Feasibility Study

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Anesthesia & Analgesia 2014 119 1105–1110

背景：胃部超聲能定性和定量評估非肥胖者的胃內容物及容量。此項研究試圖確定在嚴重肥胖患者（體重指數[BMI]≥35 kg/m2）實施胃部超聲的可行性。可行性定義爲在至少80%的受試者右側臥位顯像時，能辨別胃竇整個橫切面的能力。

方法：這是一項關於 BMI 大於 35 kg/m2 的禁食手術患者的前瞻性佇列研究。主要預後指標爲胃部超聲檢查的可行性。次要結果包括參照已有的 3 分等級系統對胃竇分級。此外將這個佇列中胃竇橫截面積（CSA）和胃容量與已發表的非肥胖個體研究的歷史資料作比較。同時報導圖像捕捉時間，竇壁厚度和胃竇深度。

結果：對 60 名患者（BMI 範圍爲 35.1–68.7）進行研究。95%的受試者在右側臥位（95% CI，0.86–0.99）和 90%的受試者在仰臥位元情況下能識別胃竇。在 88.3%（95% CI，0.77–0.95）情況下，可以確定胃竇等級（0–2）。正如預期的那樣，胃竇等級與 CSA 和胃容量相關（P＜0.0001）。與歷史資料相比，本研究結果表明，嚴重肥胖患者 CSA 和胃容量的基線比非肥胖患者更大（P＜0.001），但每單位重量的胃容量相似（P = 0.141）。

結論：胃部超聲評估在禁食的嚴重肥胖者中是可行的。資料還表明肥胖者的胃竇的大小和胃容量較非肥胖者相比更大。

（徐歡 譯 陳傑 校）

BACKGROUND: Gastric ultrasonography allows qualitative and quantitative assessment of gastric contents and volume in nonobese subjects. In this study, we sought to determine the feasibility of gastric ultrasound in severely obese patients (body mass index [BMI] ≥35 kg/m2). We defined feasibility as the ability to identify a full cross section of the gastric antrum in at least 80% of subjects when imaged in the right lateral decubitus position.

METHODS: This was a prospective cohort study on fasted surgical patients with BMI >35 kg/m2. The primary outcome measure was the feasibility of gastric sonography. Secondary outcomes included the distribution of antral grade following an existing 3-point grading system. In addition, the antral cross-sectional area (CSA) and gastric volumes in this cohort were compared with historical data from a published study in nonobese individuals. Time to image capture, antral wall thickness, and depth of the antrum are also reported.

RESULTS: Sixty patients (BMI range 35.1–68.7) were studied. The antrum was identified in 95% of subjects in the right lateral decubitus (95% CI, 0.86–0.99) and 90% of subjects in the supine position. Definition of antral grade (0–2) was possible in 88.3% (95% CI, 0.77–0.95) of cases. As expected, antral grade correlated with antral CSA and gastric volumes (P < 0.0001). When compared with historical data, our results suggest that severely obese patients have a larger baseline CSA and gastric volume than nonobese patients (P < 0.001) but a similar gastric volume per unit of weight (P = 0.141).

CONCLUSIONS: Gastric ultrasound assessment is feasible in fasted severely obese subjects. Our data also suggest that obese individuals present larger antral size and gastric volume than their nonobese counterparts.

孕婦爲何死亡？伯明罕阿拉巴馬大學從 1990 年至 2010 年內孕產婦死亡病例總結

Why Do Pregnant Women Die? A Review of Maternal Deaths from 1990 to 2010 at the University of Alabama at Birmingham

Frölich, Michael A. MD, MS*; Banks, Catiffaney BS*; Brooks, Amber MD†; Sellers, Alethia MD*; Swain, Ryan PhD, MD‡; Cooper, Lauren*

Anesthesia & Analgesia 2014 119 1135–1139

背景：在美國，被報導的妊娠相關死亡數量自近年來持續上升，從 1987 年的 7.8/100，000 上升至 2009 年的 17.8/100，000。和高加索婦女相比，非洲裔美國女性在分娩期的死亡率是前者的近 4 倍。爲了更好地理解這一趨勢，在伯明罕阿拉巴馬大學（UAB）醫院開展了這項調查研究。主要研究假設爲，與對照組正常分娩未死亡的婦女相比較，在 UAB 死亡的婦女更趨向於是非洲裔美國女性。預期會找到種族間的差異性以及其他患者因素，以幫助進一步明白種族差異在妊娠婦女死亡中的作用。

方法：調查了從 1990 年 1 月至 2010 年 12 月在 UAB 醫院的所有孕婦死亡病例，這些死亡判斷是根據試算表以及 ICD-9 號碼判斷的。每個孕婦死亡都符合 2 步判斷標準（電子設備判斷以及人工判斷）。孕婦的其他比較指標，包括合併症、住院時間、死亡原因、種族、家與醫院間的距離、收入、產前護理、體重指數、產次、保險種類、分娩方式以及婚姻狀況。計算產婦參數和病例/對照狀態單因素聯繫的強度。病例/對照狀態和種族聯繫在距家距離因素控制後也被檢驗。

結果：種族分佈因素與孕婦死亡關係的證據並不充分。在死亡組中非洲裔美國女性的比例爲 57%，而在對照組中爲 61%（P=0.23）。非洲裔美國女性對高加索族女性圍產期死亡的單因素比值比爲 0.66 （95%可信區間爲 0.37-1.19）；調整後比值比爲 1.46 （95%可信區間爲 0.37-3.01）。距醫院的距離遠相比較於近距離是孕產婦死亡的重要預測指標（P < 0.001）。

總結：在 UAB 醫院死亡的孕產婦中，種族因素並非起作用。建議今後的工作應該進一步研究在一般的健康中心而非三級醫院條件下的美國圍產期孕婦中的種族因素在死亡中的關係，以消除孕婦在獲得醫療時存在的空間障礙。

（俞芳 譯 陳傑 校）

BACKGROUND: The number of reported pregnancy-related deaths in the United States steadily increased from 7.2 deaths per 100,000 live births in 1987 to a high of 17.8 deaths per 100,000 live births in 2009. Compared to Caucasian women, African American women were nearly 4 times as likely to die from childbirth. To better understand the reason for this trend, we conducted a case-control study at University of Alabama at Birmingham (UAB) Hospital. Our primary study hypothesis was that women who died at UAB were more likely to be African American than women in a control group who delivered an infant at UAB and did not die. We expected to find a difference in race proportions and other patient characteristics that would further help to elucidate the cause of a racial disparity in maternal deaths.

METHODS: We reviewed all maternal deaths (cases) at UAB Hospital from January 1990 through December 2010 identified based on electronic uniform billing data and ICD-9 codes. Each maternal death was matched 2:1 with women who delivered at a time that most closely coincided with the time of the maternal death in 2-step selection process (electronic identification and manual confirmation). Maternal variables obtained were comorbidities, duration of hospital stay, cause of death, race, distance from home to hospital, income, prenatal care, body mass index, parity, insurance type, mode of delivery, and marital status. The strength of univariate associations of maternal variables and case/control status was calculated. The association of case/control status and race was also examined after controlling for residential distance from the hospital.

RESULTS: There was insufficient evidence to suggest racial disparity in maternal death. The proportion of African American women was 57% (42 of 77) in the maternal death group and 61% (94 of 154) in the control group (P = 0.23). The univariate odds ratio for maternal death for African American to Caucasian race was 0.66 (95% confidence interval [CI], 0.37–1.19); the adjusted odds ratio was 1.46 (95% CI, 0.73–3.01). Longer compared with shorter distance of residence to the hospital was a highly significant predictor (P < 0.001) of maternal death.

CONCLUSIONS: We did not observe a racial disparity in maternal deaths at UAB Hospital. We suggest that the next step toward understanding racial differences in maternal deaths reported in the United States should be directed at the health care delivery outside the tertiary care hospital setting, particularly at eliminating access barriers to health care for all women.

亞低溫和七氟醚聯合應用能爲改良的新生小鼠腦缺血缺氧模型提供長期保護

A Combination of Mild Hypothermia and Sevoflurane Affords Long-Term Protection in a Modified Neonatal Mouse Model of Cerebral Hypoxia-Ischemia

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Anesthesia & Analgesia 2014 119 1158–1173

背景： 缺氧缺血（HI）引起的嬰兒腦損傷會導致終身殘疾， 但尚缺乏保護策略。已證明 Rice-Vannucci 新生兒腦缺血模型（RVM）在 HI 前給予吸入麻醉藥暴露有短期而非長期的保護作用，然而 HI 期間使用藥物暴露尚未得到驗證。本研究通過對 RVM 行插管和機械通氣，評估七氟醚和亞低溫聯合應用在 HI 期間的短/長期保護作用。

方法： 10 日齡小鼠在七氟烷短暫麻醉時結紮右頸總動脈，隨後爲期 2 小時恢復。小鼠隨機分爲：HI 組，自主呼吸 10% 氧持續 60 分鐘（經典的 RVM）；HI 保護組，亞低溫和氣管插管，用 3.5%七氟醚麻醉，並在 10%氧中機械通氣持續 60 分鐘；或自主呼吸室內空氣持續 60 分鐘聯合應用。 在非存活佇列，HI 組或 HI 保護組使用可見光光譜 （Spectros Corp 公司）監測危險區域和對側半球的腦氧合情況。測量平均動脈血壓和心率，並採集動脈血氣。HI 一周後確定左/右大腦半球的重量比和腦損傷評分。在另一組中，應用了自發性運動，Morris 水迷宮和脫水嗎啡注射來評估進評估青年期小鼠（9 周齡）的學習和行爲。

結果： HI 期間，缺血兩組的同側和對側的腦氧合、動脈血 壓、血氣、血糖水準是相似的，而 HI 保護組的心率更慢。 缺血一周後，相對於 HI 保護組，腦半球的重量比和不同腦區域損傷評分在 HI 後顯著惡化。HI 後九周，HI 保護組的 Morris 水迷宮隱匿平臺和反轉平臺的逃亡潛伏期、 空間記憶功能測量均優於 HI 組 （$P<0.0001$）。作爲對紋狀體完整性的測量，HI 保護組動物的旋轉行爲在脫水嗎啡負荷後顯著減少（$P < 0.0001$)。

結論： 爲驗證新生兒腦缺血試驗期間揮發性麻醉劑的神經保護作用，研發了一種改良 RVM。HI 期間採用機械通氣和氣管插管及七氟烷麻醉，小鼠可存活。HI 期間七氟烷和亞低溫聯合應用與 RVM 小鼠相比，能同樣提供短期結構性的和長期功能性的保護作用。這些研究結果值得進一步研究以改善危重新生兒的神經系統預後。

（柳韶華 譯 陳傑 校）

BACKGROUND: Infant brain injury from hypoxia-ischemia (HI) can lead to life-long impairment, but protective strategies are lacking. Short-term but not long-term protection has been demonstrated in the Rice-Vannucci neonatal brain ischemia model (RVM) by volatile anesthetic administration before HI, while exposure during HI has not been tested. In the current study, we evaluated a combination of sevoflurane and mild hypothermia as a protective approach during HI, both short- and long-term, by introducing intubation and mechanical ventilation to the RVM.

METHODS: The right common carotid artery was ligated in 10-day-old mice during brief sevoflurane anesthesia, followed by a 2-hour recovery with the dam. Littermates were then randomized to either: HI spontaneously breathing 10% oxygen for 60 minutes (the classical RVM); HI-Protect mild hypothermia and orotracheal intubation and mechanical ventilation with 3.5% sevoflurane in 10% oxygen for 60 minutes; or Room Air spontaneously breathing room air for 60 minutes. In a nonsurviving cohort, cerebral oxygenation was monitored in the area at risk and the contralateral hemisphere during HI or HI-Protect using visible-light spectroscopy

(Spectros Corp). Mean arterial blood pressure and heart rate were measured. Arterial blood gases were obtained. Right/left brain hemispheric weight ratios and brain damage scores were determined 1 week after HI. In another group, learning and behavior were assessed in young adulthood (9 weeks) using spontaneous locomotion, Morris water maze, and apomorphine injection.

RESULTS: During HI, ipsilateral and contralateral brain oxygenation, arterial blood pressures, blood gases, and glucose levels were similar in both ischemic groups, while heart rate was slower in the HI-Protect group. One week after ischemia, brain hemispheric weight ratios and injury scores in several brain regions were significantly worse after HI, compared with HI-Protect. Nine weeks after HI, Morris water maze hidden platform and reversal platform escape latencies, measures of spatial memory function, were superior after HI-Protect, compared with HI ($P < 0.0001$). HI-Protect animals demonstrated significantly less circling behavior after an apomorphine challenge ($P < 0.0001$), a measure of striatal integrity.

CONCLUSIONS: To test the neuroprotective effects of volatile anesthetics during neonatal brain ischemia, we developed a modification of the RVM. By using mechanical ventilation and endotracheal intubation, sevoflurane administration during HI was survivable. The combination of sevoflurane administration and mild hypothermia during HI conferred not only short-term structural, but also long-term functional protection, compared with littermates treated according to the RVM. These findings warrant further studies to improve neurological outcome in critically ill infants.

關於鐮狀細胞病中的兒茶酚-o-甲基轉移酶(COMT)、Val158Met(rs4680)、多巴胺 D3 受體(DRD3)以及 Ser9Gly(rs6280)多態性和急性疼痛的探討

Dopamine D3 Receptor Ser9Gly and Catechol-O-Methyltransferase Val158Met Polymorphisms and Acute Pain in Sickle Cell Disease

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Anesthesia & Analgesia 2014 119 1201–1207

背景：鐮狀細胞病(SCD)以陣發性急性疼痛，佔用緊急醫療資源的主要病種和持續性慢性疼痛爲特點。在 SCD 患者中，持續性慢性疼痛嚴重程度和頻率以及急性醫療利用率有很大區別。本研究探討了單胺基因多態性對疼痛變化的影響。

方法：SCD 成人受試者完成一項麥吉爾電腦疼痛問卷,研究者通過該問卷計算綜合的疼痛指數。通過醫療記錄和 12 個月的每週兩次的電話隨訪獲取“佔用”資料，“佔用”定義爲因鐮狀細胞疼痛危象而就診於急診室和/或急診監護中心。對兒茶酚-o-甲基轉移酶(COMT)、Val158Met(rs4680)、多巴胺 D3 受體(DRD3)以及 Ser9Gly(rs6280)多態性進行基因分型,進一步對這些基因多態性與疼痛表型相關性做出分析。

結果：二項 logistic 模型結果顯示,DRD3、Ser9Gly 雜合子患者出現急性疼痛危象的可能性更低(比值比[OR](95%可信區間{CI}),4.37(1.39-22.89);P = 0.020) ,當考慮到人口統計變異值時結果仍然如此(OR 值(95%可信區間),4.53(1.41-28.58);P = 0.016)。相比 Val 等位基因，COMT 與 Val158Met 的 Met 等位基因出現零佔用的概率更小(OR(95%可信信區間),0.32(0.12-0.83);P = 0.020)。負二項回歸分析中,攜帶 COMT Met/Met 基因型的受試者佔用發生率比(95% CI) 是攜帶 Val/Val 基因型的受試者的 2.20(1.21-3.99)倍 (P = 0.010)。

結論：這些探索性的研究結果表明, 正如急性疼痛危象的發生率不同，DRD3、Ser9Gly、COMT 以及 Val158Met 可能參與 SCD 疼痛異質性的產生。具體來說, 攜帶 DRD3 純合子基因型、COMT 158Met 等位基因或 Met/Met 基因型的 SCD 患者, 更可能佔用急性醫療資源，即急性疼痛的一項反映指標。然而,這些研究結果需要大量後續的前瞻性研究來證實。

（池曉穎 譯 陳傑 校）

BACKGROUND: Pain in sickle cell disease (SCD) is characterized by episodes of acute pain, primarily responsible for acute health care utilization, and persistent chronic pain. Pain severity and frequency vary significantly among patients with SCD. In this study, we investigated the possible contribution of monoamine gene polymorphisms to pain variation.

METHODS: Adult subjects with SCD completed PAINReportIt® , a computerized McGill Pain Questionnaire, from which we calculated the Composite Pain Index. Utilization data were obtained from the medical record and biweekly telephone calls for 12 months. Utilization is defined as admissions to the emergency department and/or the acute care center resulting from a sickle cell pain crisis. We performed genotyping for catechol-O-methyltransferase (COMT) Val158Met (rs4680) and dopamine D3 receptor (DRD3) Ser9Gly (rs6280) polymorphisms, which were analyzed for associations with pain phenotypes.

RESULTS: Binary logistic models revealed that DRD3 Ser9Gly heterozygote patients were more likely not to have an acute pain crisis (odds ratio [OR] [95% confidence interval {CI}], 4.37 [1.39–22.89]; P = 0.020), which remained so when demographic variables were considered (OR [95% CI], 4.53 [1.41–28.58]; P = 0.016). COMT Val158Met Met allele showed lower probability for zero utilization (OR [95% CI], 0.32 [0.12–0.83]; P = 0.020) than the Val allele. In the negative binomial regression analysis, subjects with COMT Met/Met genotype had utilization incident rate ratio (95% CI) of 2.20 (1.21–3.99) over those with Val/Val (P = 0.010).

CONCLUSIONS: These exploratory findings suggest that DRD3 Ser9Gly and COMT Val158Met may contribute to pain heterogeneity in SCD, as suggested by the different rates of acute pain crisis. Specifically, SCD patients with the DRD3 homozygote genotypes, COMT 158 Met allele or Met/Met genotype, are more likely to have acute care utilization, an indicator of acute pain. These results, however, will need to be further examined in future large prospective studies.

關於接受大血管手術後發生肌鈣蛋白增高的病人進行早期心血管強化治療是否影響遠期預後的研究

The Long-Term Impact of Early Cardiovascular Therapy Intensification for Postoperative Troponin Elevation After Major Vascular Surgery

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Anesthesia & Analgesia 2014 119 1053–1063

背景：急性心臟事件是血管手術後的常見併發症，對血管手術後發生心臟事件的病人進行早期循證醫學的干預是否能影響長期預後，這一問題目前還沒有得到深入的研究。本研究中，我們有這樣一個設想：對術後心肌肌鈣蛋白水準升高的病人進行合適有效的治療能提高病人的長期生存率。

方法：我們對 667 名接受大血管手術並且術後肌鈣蛋白 I 發生升高的病人進行了佇列研究。這些病人中一部分接受了心血管方面的治療，治療方案遵照美國心臟病學會 2007 年推薦的慢性心絞痛病人的治療指南。所有術後發生肌鈣蛋白增高的病人與 2 名未發生此事件的病人進行對照，對照的配對通過邏輯回歸和最鄰近配對原則進行。最初的研究終點是術後 12 個月內無心臟重大事件（例如：死亡，心肌梗死，冠脈再灌注損傷，肺梗並且需要入院治療）發生的無病存活。

結果：在 66 個術後發生心肌肌鈣蛋白 I 升高的病人中，43 名病人得到了治療，研究結果顯示對未曾接受治療的病人相對對照組的風險比是 1.77，而接受治療組的風險比是 0.64。

術後肌鈣蛋白增高不接受早期干預的病人比接受干預的病人發生心臟事件的風險更大。（風險比爲 2.8）

結論：本研究的主要發現是對接受非心臟手術並且術後發生肌鈣蛋白增高的病人進行循證醫學的心臟早期干預能預防遠期心臟不良事件的發生。

（王飛譯 薛張綱校）

BACKGROUND: Acute cardiac events are a frequent cause of morbidity after vascular surgery. The impact of early evidence-based treatment for patients with an acute cardiac event after vascular surgery on long-term postoperative outcomes has not been extensively studied. We hypothesized that providing appropriate evidence-based treatment to patients with elevated postoperative cardiac troponin levels may limit long-term mortality.

METHODS: We conducted a study of 667 consecutive major vascular surgery patients with an elevated postoperative troponin I level. We then determined which of these patients received medical therapy as per the 2007 American College of Cardiology/American Heart Association recommendations for the medical management of patients with chronic stable angina. All patients with troponin elevation were then matched with 2 control patients without postoperative troponin elevation. Matching was done using logistic regression and nearest-neighbor matching methods. The primary study end point was 12 months survival without a major cardiac event (i.e., death, myocardial infarction, coronary revascularization, or pulmonary edema requiring hospitalization).

RESULTS: Therapy was intensified in 43 of 66 patients (65%) who suffered a troponin I elevation after surgery. Patients with a troponin I elevation not receiving intensified cardiovascular treatment had a hazard ratio (HR) of 1.77 (95% confidence interval (CI), 1.13–2.42; P = 0.004) for the primary study outcome as compared with the control group. In contrast, patients with a troponin I elevation who received intensified cardiovascular treatment had an HR of 0.63 (95% CI, 0.10–1.19; P = 0.45) for the primary outcome as compared with the control group. Patients with a troponin I elevation not receiving treatment intensification likely were at higher risk for a major cardiac event (HR, 2.80; 95% CI, 1.05–24.2; P = 0.04) compared with patients who did receive treatment intensification.

CONCLUSIONS: The main finding of this study was that in patients with elevated troponin I levels after noncardiac surgery, long-term adverse cardiac outcomes may likely be improved by following evidence-based recommendations for the medical management of acute coronary syndromes.

靜脈注射脂肪乳劑在豬身上的超敏反應：脂肪乳劑復蘇的相關研究

Hypersensitivity Reactions to Intravenous Lipid Emulsion in Swine: Relevance for Lipid Resuscitation Studies

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Anesthesia & Analgesia 2014 119 1094–1101

背景：新近文獻報導靜脈注射脂肪乳劑（ILE）在逆轉局麻藥或其他脂溶性藥物過量中毒時的心血管症狀和神經系統症狀時，在不同的動物身上得到不同的作用效果。特別地，ILE 似乎在大鼠，家兔，狗和人類有效，而對於豬卻不是。在豬身上，ILE 不僅不能逆轉麻醉藥的作用，甚至還引起廣泛的皮膚花斑或者膚色暗淡，提示產生了另外的毒性。這種毒性症狀出現在補體啓動相關的類過敏反應中，是對藥物的一種超敏反應。

方法：將 10 只約克郡豬（15-20Kg）利用氯胺酮鎮靜、異氟烷進行麻醉。分別以 1.5 和 5mL/Kg 分組注射脂肪乳劑,首先將總量的 20%通過耳緣靜脈給予注射，同時持續監測肺動

脈壓，體循環動脈血壓，心電圖，以及呼吸末 CO2，分別測定基礎水準、注射後 2 分鐘和注射後 10 分鐘迴圈中血栓素的水準。在離體試驗中，通過檢測綿羊紅細胞和游離末端補體複合物(SC5b-9)水準來探究脂肪乳劑導致的補體啓動作用。

結果：脂肪乳劑靜脈注射後幾分鐘，兩組都觀察到肺動脈壓的明顯升高，其中 1.5mL 組增加(15 [12–16.5] to 18.5 [16–20] mm Hg，5mL 組增加 15.5 [13–17.25] to 39.5 [30.5–48.5]，P = 0.0058。注射後，也出現了體循環動脈壓的升高和心率降低。靜脈注射脂肪乳劑後 1.5mL 組中血栓烷 B2 的血漿濃度從基礎值 617.3 [412.4–920]增加到 1132 [597.9–1417] pg/mL，(P = 0.0055)；5mL 組從基礎值 1276 [1200–2581]增加到 4046 [2946–8442] pg/mL (P = 0.0017)。靜脈注射脂肪乳劑並不會引起體外人血清中補體的啓動。

結論：在豬身上，ILE 可引起明顯的血流動力學改變和血栓素血漿濃度的明顯增加。但是，體外試驗並沒有證實有人血清補體系統參與了這種超敏反應過程，其內在機制尚待闡明。然而，試驗中觀察到靜脈注射脂肪乳劑後的血流動力學和生物學效應也提示我們，豬不能作爲靜脈注射脂肪乳劑的理想動物模型。

（潘豔譯 薛張綱校）

BACKGROUND: Reports in the recent experimental literature have provided contradicting results in different animal species regarding the efficacy of IV lipid emulsion (ILE) in the reversal of cardiovascular and central nervous system symptoms of local anesthetic and other lipophilic drug overdoses. In particular, ILE seemed to be effective in rats, rabbits, dogs, and humans, but not in swine, for which it not only failed to reverse the adverse effects of anesthetics, but the animals also developed a generalized cutaneous mottling or a dusky appearance immediately after ILE, suggestive of another type of toxicity. The latter symptoms arise in complement (C) activation–related pseudoallergy, a hypersensitivity reaction to particulate drugs and agents.

METHODS: Ten Yorkshire swine (15–20 kg) were sedated with ketamine and anesthetized with isoflurane. ILE 1.5 and 5 mL/kg 20% was administered via the ear vein while pulmonary arterial pressure, systemic arterial blood pressure, electrocardiogram, and end-tidal CO2 were recorded continuously. Thromboxane was measured in blood collected at baseline and 2 and 10 minutes after injections. Complement activation by lipid emulsion was also assessed in vitro with soluble terminal complement complex (SC5b-9) and sheep red blood cell assays.

RESULTS: Significant increases were observed in the pulmonary pressure (median [interquartile range]) within minutes after the administration of ILE, both at doses 1.5 and 5 mL/kg (15 [12–16.5] to 18.5 [16–20] mm Hg, P = 0.0058 and 15.5 [13–17.25] to 39.5 [30.5–48.5], respectively). The systemic arterial blood pressure increased, and the heart rate decreased after both injections. Thromboxane B2 concentration (median [interquartile range]) in the blood plasma increased from a baseline of 617.3 [412.4–920] to 1132 [597.9–1417] pg/mL (P = 0.0055) and from 1276 [1200–2581] to 4046 [2946–8442] pg/mL (P = 0.0017) after the administration of 1.5 and 5 mL/kg ILE, respectively. Intralipid did not cause in vitro complement activation in human serum.

CONCLUSIONS: ILE causes clinically significant hemodynamic changes in pigs, in concert with significant increases in the plasma thromboxane concentration. However, the in vitro tests did not confirm involvement of the complement system in human sera, leaving the underlying mechanism of these findings in doubt. Nonetheless, the observed hemodynamic and biochemical effects of ILE serve as a caveat that the pig is not an ideal model for the study of interventions involving ILE.

腹部手術中急性腎損傷的危險因素

Variations in the Risk of Acute Kidney Injury Across Intraabdominal Surgery Procedures

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Anesthesia & Analgesia 2014 119 1121–1132

背景：目前有關圍術期急性腎損傷的研究重點主要關注心臟和大血管手術。而在一般非心血管手術中，普外科腹部手術已被確定具有發生急性腎損傷的高風險，但不同類型的腹部手術發生急性腎損傷的風險變化和對 30 天死亡率的影響的研究還不是很透徹。

方法：我們使用美國外科學院國家外科品質改進計畫(2005 - 2010)來將患者區分爲 15 組普外科腹部手術(n = 457656)。急性腎損傷定義爲肌酐水準參照基線和/或透析水準增加大於 2 mg / dL。相對風險回歸模型被用來評估整個過程急性腎損傷的相對風險。外科手術、急性腎損傷和 30 天死亡率分層之間的關係，使用相對風險回歸模型進行評估。

結果：普外科腹部手術患者圍術期急性腎損傷的總體發病率爲 1.1%，其中闌尾切除術發生率爲 0.2%，胃旁路手術發生率爲 0.3%，小腸切除術發生率爲 2.6%，開腹探查術發生率 3.5%。發生圍術期急性腎損傷的患者中有 31.3%在 30 天內死亡，而相比之下，那些沒有發生圍術期急性腎損傷的患者 30 天死亡率爲 1.9%。併發症和手術因素調整後，圍術期急性腎損傷與 30 天死亡率風險增加 3.5 倍有關（調整風險比 3.51,95%可信區間(CI),3.29 - -3.74)。在單個考核中，估計 30 天死亡率與急性腎損傷的風險比在開腹探查術爲 1.87(95% CI,1.62 - -2.17)，在胃旁路手術爲 31.6(95% CI,17.9 - -55.9)。

結論：在普外科腹部手術過程中，急性腎損傷發生率和其對 30 天死亡率有著顯著不同的影響。這強調了術前風險識別和分層作爲一個重要危險因素對圍術期急性腎損傷和 30 天死亡率的重要性。

（黃文惠譯 薛張綱校）

BACKGROUND: The literature on perioperative acute kidney injury (AKI) focuses mainly on cardiac and major vascular surgery. Among noncardiac general surgery procedures, intraabdominal general surgery has been identified as high risk for developing AKI, but variations in AKI risk and its impact on 30-day mortality among different types of abdominal surgeries are not well characterized.

METHODS: We used the American College of Surgeons National Surgical Quality Improvement Program (2005–2010) to identify patients in 15 intraabdominal general surgery procedure categories (n = 457,656). AKI was defined as an increase in the creatinine level of >2 mg/dL above baseline and/or dialysis. Relative risk regression modeling was used to assess the relative risks of AKI across the procedures. The relationships among surgical procedure, AKI, and 30-day mortality stratified by procedure type were assessed using relative risk regression.

RESULTS: The overall incidence of AKI among intraabdominal surgery patients was 1.1%, which varied from 0.2% in appendectomy and 0.3% in gastric bypass patients to 2.6% in small bowel resection and 3.5% in exploratory laparotomy patients. Of the patients who developed AKI, 31.3% died within 30 days, compared with 1.9% of those who did not develop AKI. After adjusting for comorbidities and operative factors, AKI was associated with a 3.5-fold increase in the risk of 30-day mortality (adjusted risk ratio, 3.51, 95% confidence interval [CI], 3.29–3.74). Among individual procedures, the estimated adjusted risk ratio of 30-day mortality associated with AKI ranged from 1.87 (95% CI, 1.62–2.17) in exploratory laparotomy to 31.6 (95% CI, 17.9–55.9) in gastric bypass.

CONCLUSIONS: The incidence of AKI and the impact of AKI on 30-day mortality vary markedly across procedures within intraabdominal general surgery. This highlights the importance of preoperative risk stratification and identifies procedure type as a significant risk factor for AKI and 30-day mortality.

脊柱側彎兒童術中的丙泊酚血藥濃度測量值與預測值的比較

Measured versus predicted blood propofol concentrations in children during scoliosis surgery.

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Anesthesia & Analgesia 2014 119 1150–1157

背景：丙泊酚常作爲脊柱側彎手術靜脈麻醉的首選藥物。與其他藥物相比，丙泊酚不但能抑制術中可能誘發的脊髓反射，而且能更準確診斷脊髓缺血。本研究主要針對兒童脊椎側彎手術，對手術實施丙泊酚靶控靜脈麻醉時的即時血藥濃度和預測濃度進行比較。

方法：本研究 20 例脊柱側彎兒童入組，在麻醉過程中每隔 30 分鐘測定動脈血丙泊酚即時值（Cm）和預測值（Cp）。測定 Cm 的方法是利用床旁即時檢測儀器完成。手術麻醉管理不受該試驗影響。對資料的誤差中位數，絕對誤差中位數，變異度和離散度均進行統計分析。

結果：入組兒童年齡區間爲 9 歲-17 歲，體重爲 26.5 千克-95 千克。丙泊酚靜脈輸注模式中 Paedfusor 模式入組 16 例，Marsh 模式入組 4 例。154 例丙泊酚血藥濃度樣本資料中，Cm 和 Cp 平均數誤差爲 1.5 μg/ml（可信區間，-1.4 到 4.5 μg/ml），均數的標準誤爲 44.7%（可信區間，-40.1% 到 130.2%）。對於整個樣本，誤差中位數和絕對誤差中位數分別爲 39.8% （值域, -20.9%-103.3%）和 39.8% （值域, 20%-103.3%）。測量值和預測值的誤差可通過注射時間的延長而縮小（離散度，-2.2 [值域，-1.03 到 0.13]）。樣本中大部分患者 Cm 都大於 Cp，但樣本中有兩位元兒童的 Cm 均小於 Cp（最低 Cm 分別爲 1.74μg/ml 和 1.96μg/ml，對應的 Cp 均爲 3μg/ml）。兩位元兒童均入組 Paedfusor 模式，體重分別爲 28kg 和 33kg。

結論：丙泊酚靶控輸注模式不適合用於兒童脊柱側彎手術。床旁即時丙泊酚檢測方案對於丙泊酚靜脈注射達到預期血藥濃度更爲可行。

（王嘉興譯 薛張綱校）

BACKGROUND: Propofol anesthesia is preferred during scoliosis surgery because it suppresses evoked potential spinal cord function less than other drugs and better enables the detection of spinal cord ischemia. In this study, we determined the difference between the true and predicted blood propofol levels during target-controlled infusions in children during scoliosis surgery.

METHODS: Arterial blood propofol measured concentrations (Cm) were compared with predicted concentrations (Cp) approximately every 30 minutes during the maintenance phase of anesthesia in 20 children. Whole blood propofol concentrations were measured using a point-of-care blood propofol analyzer. Anesthesia management was not affected by the study. The median performance error, median absolute performance error, wobble, and divergence were calculated.

RESULTS: Children were aged 9 to 17 years and weighed 26.5 to 95 kg. The Paedfusor model was used in 16 children and the Marsh model in 4 children. In 154 blood propofol measurements, the mean difference between the Cm and Cp was 1.5 μg•mL (limits of agreement, -1.4 to 4.5 μg•mL), and the mean performance error was 44.7% (limits of agreement, -40.1% to 130.2%). The median performance error and median absolute performance error for the whole group were 39.8% (range, -20.9% to 103.3%) and 39.8% (range, 20%-103.3%), respectively. The performance errors improved with increase in duration of infusion (divergence, -2.2 [range, -1.03 to 0.13]). Cm was almost always larger than Cp except in 2 children who had consistently lower Cm than Cp (lowest Cm(s) were 1.74 and 1.96 μg•mL when the Cp was 3 μg•mL); both had the Paedfusor model and their body weights were 28 and 33 kg.

CONCLUSIONS: Propofol target-controlled infusion models had poor performance characteristics in children undergoing scoliosis surgery. Point-of-care propofol assay may enable adjustment of the infusion to better achieve the intended blood level.

兒茶酚氧位甲基轉移酶基因多態性預測阿片類藥物術後鎮痛的用量

Catechol-o-methyltransferase polymorphisms predict opioid consumption in postoperative pain.

Candiotti KA1, Yang Z, Buric D, Arheart K, Zhang Y, Rodriguez Y, Gitlin MC, Carvalho E, Jaraba I, Wang L.

Anesthesia & Analgesia 2014 119 1194–1200

背景：以往的研究探討了兒茶酚-O-甲基轉移酶（COMT）的酶 rs4680 多態性與阿片類藥物在慢性癌性疼痛治療中的用量的關係。在這項研究中，我們評估 COMT rs4680 和 rs4818 的多態性與腎切除後術後急性期阿片類藥物用量的關係。

方法：總共評估了 152 例腎切除患者術後 48 小時內的阿片類藥物用量和疼痛評分。每位患者的基因型是從血液樣品中通過對 DNA 的聚合酶鏈反應來提取的。rs4680 和 rs4818 的多態性與阿片類藥物用量的關係是通過廣義線性回歸模型分析完成的。3 個基因組之間比較的所有 P 值和置信區間採用 Bonferroni 校正。

結果：在手術後 24 小時內（COMT rs4680），Val/Val 變異的純合子患者比 MET / Met 組患者消耗的阿片類藥物多 36%（95%可信區間爲 31%-41%）（P = 0.009）。在術後第一個 24 小時，疼痛評分或嘔吐藥物的使用，3 個基因組無統計學顯著差異。與攜帶 rs4818 GG 基因型的患者組相比較，攜帶 rs4818 CC 基因組患者使用的嘔吐藥物在統計學上顯著增加（P =0.035）。在術後 6-48 小時期間，對於 COMT rs4680 來說，高活性 Val/Val 基因型組的患者比 Met/ Met 組顯著消耗更多的阿片類藥物（0-6 h：P= 0.005; 0-12 h：P= 0.015; 0-24h：P =0.015; 0-48 h：P=0.023）。在腎切除術後 6 小時內，純合 GG 基轉移酶 rs4818 單核苷酸多態性組的患者比 CG 組患者消耗更多的阿片類藥物，統計學上有顯著差異（P= 0.02）。

結論：對腎切除術圍術期的患者來說，COMT rs4680 單核苷酸多態性的遺傳變異與阿片類藥物用量相關。該 COMT rs4818 多態性可能有助於預測術後嘔吐藥物的使用。

（吳赤譯 薛張綱校）

BACKGROUND: Previous studies have associated the catechol-O-methyltransferase (COMT) enzyme rs4680 polymorphism with opioid consumptionin the treatment of chronic cancer pain. In this study, we evaluated the association between COMT rs4680 and rs4818 polymorphisms and opioidconsumption in the acute postoperative period after a nephrectomy.

METHODS: Opioid consumption and pain scores were evaluated in 152 patients for 48 hours after nephrectomy. The genotype of each patient was determined using polymerase chain reaction on DNA extracted from blood samples. The association between rs4680 and rs4818 genotypes andopioid consumption was evaluated using general linear model regression analysis. All P values and confidence intervals were Bonferroni corrected for the 3 comparisons among genotypes.

RESULTS: In the 24-hour period after surgery (COMT rs4680), patients homozygous for the variant Val/Val consumed 36% (95% confidence interval, 31%-41%) more opioids than patients homozygous for the Met/Met group (P = 0.009). No statistically significant differences among the 3 genotype groups were noted for pain scores or emesis medication use in the first 24 hours after surgery. There was a statistically significant increase in emesis medication use in patients possessing the CC genotype of rs4818 when compared to patients carrying the GG genotypes (P = 0.035). In the 6- to 48-hour postsurgery period, there was significantly higher opioid consumption in the high-activity homozygotes Val/Val than in the homozygous Met/Met group for COMT rs4680 (0-6 h: P = 0.005; 0-12 h: P = 0.015; 0-24 h: P = 0.015; and 0-48 h: P = 0.023). Patients in the homozygous GG group COMT rs4818 single nucleotide polymorphism showed

statistically significant differences in opioid consumption in the first 6 hours after nephrectomy compared with heterozygous CG patients (P = 0.02).

CONCLUSIONS: The genetic variant of the COMT rs4680 single nucleotide polymorphism is associated with variability in opioid consumption inpostoperative nephrectomy patients. The COMT rs4818 polymorphism may prove useful in predicting emesis medication use postoperatively.

每天三次使用普通肝素預防血栓形成的病人行硬膜外麻醉：活化部分凝血酶時間的測定

Epidurals in patients receiving thromboprophylaxis with unfractionated heparin three times a day: the value of activated partial thromboplastin time testing.

Pace M1, Koury K, Gulur P.

Anesthesia & Analgesia 2014 119 1215–1218

背景：在美國，非骨科手術病人爲預防深靜脈血栓形成給予每天三次皮下注射普通肝素。目前對於每天三次皮下注射普通肝素的病人實施椎管內麻醉的風險，尚缺少這方面的資料；儘管如此，對更高風險的出血的關注已逐步提高。爲減少此類病人拔除硬膜外導管時的出血風險，我們將測定的活化部分凝血酶時間作爲參考，此項前瞻性研究就是來評價這種措施的可行性。

方法：我們收集了 2011 年 12 月至 2013 年 12 月間每天三次或兩次注射 5000 單位普通肝素並且實施硬膜外麻醉的病人的電子病歷資料。每天三次注射 5000 單位普通肝素的病人在拔除硬膜外導管前均做活化部分凝血酶時間測定。每天兩次注射 5000 單位普通肝素的病人只是在凝血異常變數相關的危險因素出現時進行活化部分凝血酶時間測定。我們對異常活化部分凝血酶時間的病人進行病例回顧研究來評價相關有價值的危險因素。

結果：兩年期間總共有 3523 例硬膜外麻醉，包括 714（20.3%）例每天三次普通肝素注射和 1594（45.2%）例每天兩次普通肝素注射。在每天兩次普通肝素注射的病人中，186（11.7%）例有危險因素的病人測定了活化部分凝血酶時間。在這些病人中有 10 例在硬膜外導管拔除時的活化部分凝血酶時間延長 35 秒以上。在每天三次普通肝素注射的病人中有 20 例在硬膜外導管拔除當天的活化部分凝血酶時間延長 35 秒以上。所有活化部分凝血酶時間異常的每天三次肝素注射病人都伴隨著明顯的凝血參數異常的危險因素。不管是每天三次還是每天兩次肝素注射的病人都沒有出現血腫情況。

結論：爲減少每天三次注射普通肝素的病人拔除硬膜外導管時的出血風險，將測定活化部分凝血酶時間作爲參考，在我們的結果中是沒有證據支援的，因爲僅僅有 2.8%的病人活化部分凝血酶時間異常。 我們的研究爲每天三次接受普通肝素治療的不同硬膜外鎮痛的安全性提供了有限的資料。既然很少出現神經源性血腫，我們目前的樣本量大小也就不能對每天三次注射普通肝素病人實施硬膜外鎮痛的危險性得出最終明確的結論。

（呂越昌譯 薛張綱校）

BACKGROUND: Dosing subcutaneous (SC) unfractionated heparin (UFH) 3 times a day (TID) for deep venous thrombosis prophylaxis is used for patients in the United States undergoing nonorthopedic surgery. There is a lack of data on the risks of neuraxial techniques in patients receiving TID SC UFH; however, concerns have been raised about higher bleeding risks. In this prospective study, we evaluated the value of activated partial thromboplastin time (aPTT) testing at the time of removal of epidural catheters as a risk-reduction strategy for this population.

METHODS: We collected data from our electronic hospital databases for all patients receiving epidural analgesia in conjunction with 5000 units TID or twice daily dosing (BID) SC UFH from December 2011 to December 2013. Our cohort received aPTT testing before removal of the catheter in all patients receiving TID SC UFH. An aPTT was ordered for patients receiving BID

SC UFH only if risk factors for abnormal coagulation variables were identified. Chart reviews were performed on all patients with abnormal aPTT values to evaluate contributing risk factors.

RESULTS: Over a 2-year period, 3523 epidurals were placed at our institution, including 714 (20.3%) for patients receiving TID SC UFH, and 1594 (45.2%) for patients receiving BID SC UFH. Of those patients receiving BID SC UFH, 186 (11.7%) had aPTT values drawn on the basis of risk factors. Ten (5.4 %, 95% CI: 2.6%-9.7%) of those patients had an aPTT value of greater than 35 seconds on the date of epidural removal. Of those patients receiving TID SC UFH, 20 (2.8%, 95% CI: 1.7%-4.3%) had an initial aPTT value of more than 35 seconds on the date of epidural removal. All patients who had abnormal aPTT values on TID heparin dosing were identified as having obvious concomitant risk factors for coagulation parameter abnormalities. There were no epidural hematomas in patients receiving either BID or TID dosing (95% CI: 0%-0.001%).

CONCLUSIONS: The routine use of aPTT testing on patients receiving TID SC UFH at the time of removal of epidural catheters as a risk-reduction strategy is not supported by our results, where only 2.8% (95% CI: 1.7%-4.3%) of these patients had abnormal aPTT values. Our study adds to the limited data currently available on the safety of epidural analgesia in patients receiving TID SC UFH. Given the rare incidence of neuraxial hematoma (95% CI: 0%-0.001%), definitive conclusions on the risks of TID SC UFH administration in patients receiving epidural analgesia cannot be drawn based on our sample size.

術中應用地塞米松對心臟手術病人術後譫妄的影響：一項隨機的臨床試驗

Intraoperative dexamethasone and delirium after cardiac surgery: a randomized clinical trial.

Sauër AM, Slooter AJ, Veldhuijzen DS, van Eijk MM, Devlin JW, van Dijk D.

Anesth &Analg 2014 119 1046-52.

背景：心外科手術的病人術後常會發生譫妄，發生術後譫妄可能與手術所觸發的全身炎症反應有一定關係，而使用地塞米松可以減少炎症反應。我們假設術中給予大劑量的地塞米松——一種有效的消炎作用的藥物，將會減少心外科手術病人術後前四天中任意時間譫妄的發生率。

方法：這是一個大容量、多中心的對照控制的隨機臨床試驗的其中一個單中心的亞組，這一地塞米松用於心外科手術臨床試驗採用了雙盲的試驗方法，隨機選取≥18 周歲、手術過程中應用了心肺分流術的心外科手術病人，在麻醉誘導期間，一組給予地塞米松 1 mg/kg，另一組給予安慰劑。在術後的前四天裡，我們比較了限制使用和分別給予氟呱啶醇、苯二氮卓類、阿片類藥物組術後譫妄的發生率（以適用於重症監護室的雜亂性評價方法爲基礎，或者是離開重症監護室以後，通過雜亂性評價以及圖表回顧的方法）。試驗資料的分析採用了意向性治療原則。地塞米松組的術後譫妄的發生比例和對照組相比，資料採用比值比在 95%的可信區間這一方法。這 2 組病人的資料比較同樣採用邏輯回歸來調整可能混淆術後譫妄發生率的常規基線變數。

結果：在 768 個符合條件的病人中，737 人（96%）完成了資料的採集。地塞米松組術後譫妄的發生率爲 14.2%，而對照組爲 14.9%，兩者資料相近（原始的比值比爲 0.95,95%可信區間爲 0.63-1.43；調整後的比值比爲 0.85，95% 可信區間爲 0.55-1.31）。在發生譫妄的病人中，地塞米松組和對照組持續時間的中位數（四分位差）也相近（分別爲 2 [1-3] 和 2 [1-2] 天，P = 0.45; WMW 0.98, 95% 可信區間爲 0.83-1.17）。這兩組病人的限制使用和分別給與氟呱啶醇、苯二氮卓類、阿片類藥物的資料也同樣相近。

結論：術中給予地塞米松不會減少心外科手術病人術後前四天譫妄的發生率和持續時間。

(田園 譯 李士通 審校)

BACKGROUND: Delirium is common after cardiac surgery and may be partly related to the systemic inflammatory response triggered by the surgery and the use of cardiopulmonary bypass. We hypothesized that intraoperative administration of high-dose dexamethasone, a drug with potent anti-inflammatory effects, would reduce the incidence of delirium at any time point during the first 4 postoperative days after cardiac surgery.

METHODS: This was a single-center substudy within a larger, multicenter placebo-controlled randomized clinical trial, the Dexamethasone for Cardiac Surgery (DECS) trial that randomized patients ≥18 years, undergoing cardiac surgery with cardiopulmonary bypass, to receive, in a double-blind fashion, either dexamethasone 1 mg/kg or placebo at the induction of anesthesia. Over the first 4 postoperative days, we compared between groups the incidence of delirium (based on the Confusion Assessment Method adapted for the intensive care unit, or after intensive care unit discharge, by the Confusion Assessment Method, accompanied by chart review), restraint use, and administered haloperidol, benzodiazepines, and opioids. Data were analyzed according to the intention-to-treat principle. The proportion of patients with delirium in the dexamethasone versus the placebo group was compared using the odds ratio (OR) with a 95% confidence interval (CI). The proportion also was compared using logistic regression to adjust for common baseline variables that might confound the presence of delirium between the 2 groups.

RESULTS: Of 768 eligible patients, 737 subjects (96.0%) had complete data. The incidence of delirium was similar between the dexamethasone (14.2%) and placebo (14.9%) groups (crude OR = 0.95, 95% CI, 0.63-1.43; adjusted OR = 0.85, 95% CI, 0.55-1.31). Among patients who developed delirium, the median (interquartile range) duration of delirium was similar between the dexamethasone and placebo groups (2 [1-3] vs 2 [1-2] days, respectively, P = 0.45; WMWodds 0.98, 95% CI, 0.83-1.17). Restraint use and the administration of haloperidol, benzodiazepines, and opioids were also similar between the 2 groups.

CONCLUSIONS: The intraoperative administration of dexamethasone did not reduce the incidence or duration of delirium in the first 4 days after cardiac surgery.

不同深度神經肌肉阻滯對低腹壓腹腔鏡膽囊切除術的手術操作空間情況的影響：一項隨機的臨床試驗全關節置換術後防跌倒策略以及患者特徵對術後跌倒率的影響

Fall-prevention strategies and patient characteristics that impact fall rates after total knee arthroplasty.

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Anesth & Analg 2014 119 1113-8

背景：由於術後跌倒會引發嚴重的外傷，防跌倒監測已經成爲國家質控重點內容，同時受到各醫學學會的重視。在該研究中，我們通過統計分析進行全關節置換術後的患者發生跌倒的幾率，著重研究防跌倒策略的特點及其影響。

方法：在此研究中，我們回顧了從 2003 年到 2012 年 10 年內進行電子記錄下全關節置換術後發生跌倒的患者資訊，包括患者的人口統計資料，即患者的年齡、性別、身體品質指數（BMI）等。通過對患者上述資料進行統計分析，進一步研究預防患者發生術後跌倒的多種因素，包括病人宣教、Hendrich II 跌到風險評估模型中的相關因素、跌倒前的預警特徵、病人的電梯使用率下降等。

結果：據統計，從 2003 年 1 月 2 日到 2012 年 12 月 31 日，在這 10 年期間共有 15,189 例全關節置換術在 Methodist 醫院完成。總體的患者術後跌倒率爲 15.3‰（選擇 95%的可信

區間，CI 值爲 13.4-17.4）。在早期防跌倒策略的實施的過程中，患者的術後跌倒率隨之緩慢下降，其差異具有統計學意義（P < 0.001）。多因素分析發現，隨著時間的推移，老年人的術後跌倒率有所提高（通過將年齡位於 70-79 歲組和年齡≥80 歲組與年齡介於 60-69 歲組的患者進行比較，P < 0.001）。而進行過關節修復術的患者與進行全關節置換的患者相比，術後跌倒率前者明顯下降，這一差異同樣具有統計學意義。對於跌倒率與性別因素及 BMI 指數因素的關係，研究結果表明差異不存在統計學意義。大多數患者是在自己的病房內發生跌倒（72%; 95% CI: 66%-78%）。在收集資料時發現，不符合研究標準的跌倒（如在床頭洗臉台、盥洗室內或離開、去往盥洗室的途中發生的跌倒）佔據收集到總體資料的絕大部分（59%; 95% CI: 53%-65%）。根據 Hendrich II 跌到風險評估模型的分析，大多數發生跌倒的患者被認爲並不具備相應的高危因素。23%的術後跌倒患者與手術時訪視及摩擦相關。

結論：我們的研究資料表明：患者術後跌倒率的降低與多重介入的防跌倒策略的實施相關。儘管上述預防策略發揮了一定的作用，但是高齡患者、不符合研究標準的跌倒情況、處於中間期（術後 1-3 天）復蘇階段的患者，仍有很高的風險發生跌倒。因此，防跌倒策略應該繼續加強病人宣教，特別是高齡患者，提高風險意識，同時對需要在病房內進行監護的患者的防護措施進行加固與改進。

(許紅嬌 譯 李士通 審校)

BACKGROUND: Fall prevention has emerged as a national quality metric, a focus for The Joint Commission, because falls after orthopedic surgery can result in serious injury. In this study, we examined patient characteristics and effects of fall-prevention strategies on the incidence of postoperative falls in patients undergoing total knee arthroplasty.

METHODS: We reviewed electronic records of all patients who fell after total knee arthroplasty between 2003 and 2012 (10 years). Patient demographics, including age, sex, and body mass index, were analyzed. The impact of various fall-prevention efforts, including provider and patient education, Hendrich II Fall Risk Model, fall-alert signs, and the use of patient lifts on the incidence of falls, also was studied.

RESULTS: Between January 2, 2003, and December 31, 2012 (10 years), 15,189 total knee arthroplasties were performed at Methodist Hospital, Mayo Clinic Rochester, MN. The overall fall rate was 15.3 per 1000 patients (95% confidence interval [CI]: 13.4-17.4). The rate varied significantly (P < 0.001) during the 10-year period with an initial increase followed by a gradual decrease after the initiation of the fall-prevention strategies. From multivariable analysis adjusting for the temporal trends over time, the odds of falling were found to increase with older age (odds ratio = 1.7 and 2.0 for those 70-79 and ≥80 compared with those 60-69 years of age; P < 0.001) and were lower for patients undergoing revision compared with primary total knee arthroplasties (odds ratio = 0.6, P = 0.006). There was no statistically significant difference in fall rates by sex or body mass index. Most patient falls (72%; 95% CI: 66%-78%) occurred within their own rooms. Elimination-related falls (those that occurred while in the bathroom, while going to and from the bathroom, or while using a bedside commode) comprised a majority (59%; 95% CI: 53%-65%) of the falls. Most patients who fell were not considered high risk according to the Hendrich II Fall Risk Model. Twenty-three percent of falls were associated with morbidity, including 7 return visits to the operating room and 2 new fractures.

CONCLUSIONS: Our data demonstrate a reduction in fall incidence coinciding with the implementation of a multi-intervention fall-prevention strategy. Despite prevention efforts, patients of advanced age, elimination-related activities, and patients in the intermediate phase (late postoperative day 1 through day 3) of recovery continue to have a high risk for falling. Therefore, fall-prevention strategies should continue to provide education to all patients (especially elderly patients) and reinforce practices that will monitor patients within their hospital rooms.

產後出血的臨床治療進展

Medical advances in the treatment of postpartum hemorrhage.

Ducloy-Bouthors AS1, Susen S, Wong CA, Butwick A, Vallet B, Lockhart E.

Anesth & Analg 2014 119 1140-7

摘要：產後出血（PPH）是造成全世界產婦死亡的主要因素。關於外傷導致的產後嚴重出血處理的研究進展可能爲 PPH 的處置方法提供了新的觀點，但必須慎重考慮到外科損傷與分娩損傷的差異。在本研究中，我們總結了目前階段對主要由分娩損傷引起的產後出血的處理策略，包括（1）快速實驗室凝血功能檢測，（2）對於嚴重的大出血應早期輸注血漿或紅細胞懸液（3）使用氨甲環酸，對於同時合併有凝血障礙的複雜型 PPH 患者應大劑量集中使用纖維蛋白原。

(許紅嬌 譯 李士通 審校)

Abstract：Postpartum hemorrhage (PPH) is a leading cause of maternal mortality worldwide. Recent advances in the management of severe bleeding for trauma patients may provide insight into PPH management, but must be applied with caution considering the significant differences between trauma and obstetric patients. In this review, we summarized evidence for current management strategies for patients with major obstetric hemorrhage, including (1) rapid laboratory assessment of coagulopathy, (2) early transfusion of plasma and high plasma-to-red blood cell transfusion ratios in massive PPH, and (3) use of tranexamic acid and fibrinogen concentrates in the setting of PPH complicated by coagulopathy.

麻醉方案是否會影響全身麻醉過程中產生的無意識記憶？

Does anesthetic regimen influence implicit memory during general anesthesia?

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Anesth & Analg 2014 119 1174-9

背景：在全麻過程中，由於術中聽覺刺激所產生的無意識學習（記憶）很難予以量化評估，但其可能需要傷害性刺激的存在。我們推測，採取低劑量阿片類藥物的麻醉方案可能會增加無意識記憶，而採用高劑量的阿片類藥物則不會。

方法：120 名患者被隨機分成三組。所有患者採取丙泊酚和瑞芬太尼誘導麻醉，靶向 BIS 值爲 50。第一組的瑞芬太尼效應濃度（in ng/mL）爲丙泊酚（(in μg/mL)）的兩倍，而第二組瑞爲丙的 1/2。在手術過程中，兩組病人通過耳機聽取一段 20 個單詞的列表，第三組作爲對照組不給予單詞表聽取。在單詞播放時記錄 BIS 值。

結果：高濃度阿片類藥物組中 67.5% [50.7%; 80.9%] ，低濃度阿片類藥物組中 72.5% [55.9%; 84.9%] 擁有至少一段 BIS >60 的經歷，但三組患者的記憶測試沒有統計學差異。

結論：在低劑量及高劑量阿片類藥物的丙泊酚-瑞芬太尼麻醉方案中，都不能證明術中無意識及明確記憶的存在。

(李蔚文 譯 李士通 審校)

BACKGROUND: Implicit learning of intraoperative auditory stimuli during general anesthesia is very difficult to quantify but may require the presence of noxious stimulation. We hypothesized that an anesthetic regimen with a low dose of opioid would enhance implicit memory, while a regimen with a high dose of opioid would not.

METHODS: One hundred-twenty patients were randomized into 3 groups. All patients were anesthetized with a target-controlled infusion of propofol and remifentanil, targeting a Bispectral Index (BIS) value of 50. The remifentanil effect-site concentration (in ng/mL) was always

double that of propofol (in μg/mL) in the first group and half of that in the second group. Patients in these 2 groups were played a list of 20 words via headphones during surgery. The third group served as control for memory tests and was not played any word during anesthesia. BIS was recorded during word presentation.

RESULTS: No statistical difference was found among the 3 groups regarding 3 different memory tests although 67.5% [50.7%; 80.9%] of the patients of the high-opioid group and 72.5% [55.9%; 84.9%] of the low-opioid group had at least 1 episode of BIS >60.

CONCLUSIONS: We could not demonstrate the presence of implicit or explicit memorization under propofol-remifentanil anesthesia either with a low- or a high-dose opioid anesthetic regimen.

慢性背根神經節壓縮大鼠脊髓水準 NR2B 亞基棕櫚醯化的作用。

The Effect of NR2B Subunit Palmitoylation at the Spinal Level After Chronic Dorsal Root Ganglia Compression in Rats.

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Anesth Analg. 2014 Nov;119(5):1208-14

背景：NR2B 亞基（N-甲基-D-天冬氨酸受體 2B 亞基）調節疼痛的來源，並參與中樞敏化的形成。棕櫚被證明參與調節 N-甲基-D-天冬氨酸受體的形成。在本研究中，我們研究了大鼠慢性背根神經節的壓縮（CCD）模型中，NR2B 亞基的棕櫚醯化的作用。

方法：CCD 模型術後鞘內注射棕櫚醯化的抑制劑（2- bromopalmitate[2 - BP]），爲評估機械性異常性疼痛和 CCD 術後之後熱痛覺過敏，本研究採用爪子機械痛閾和縮爪的熱潛伏期作爲指標。實驗方法有生物素標記法，Western Blot，co-IP，用於研究疼痛處理的效果以及脊髓水準 NR2B 棕櫚醯化和磷酸化的表達變化。

結果：CCD 的大鼠具有持久的熱痛覺過敏和機械性異常性疼痛，伴隨脊髓水準 NR2B 棕櫚醯化和磷酸化水準的上調。CCD 手術後用 2-BP 鞘內治療第 14 天，大鼠疼痛行爲明顯改善， NR2B 棕櫚醯化和磷酸化的表達水準明顯下調。

結論：研究資料表明，在 CCD 的誘導的慢性神經痛模型中，NR2B 的棕櫚醯化水準上調；鞘內注射 2-BP 克減少疼痛行爲並下調 NR2B 磷酸化。我們的研究結果表明，脊髓 NR2B 棕櫚醯化是在 CCD 引起的慢性神經痛的發生機制中起重要作用，它可能是指導治療慢性疼痛治療的潛在靶標。

(李蔚文 譯 李士通 審校)

Abstract

BACKGROUND:

The NR2B subunit (N-methyl-D-aspartate receptor 2B subunit) regulates the source of pain, and it participates in the formation of central sensitization. Palmitoylation was shown to be involved in the regulation of N-methyl-D-aspartate receptor internalization. In the present study, we investigated the effects of NR2B subunit palmitoylation in a chronic dorsal root ganglia compression (CCD) rat model.

METHODS:

Paw mechanical withdrawal threshold and paw withdrawal thermal latency were used to assess mechanical allodynia and thermal hyperalgesia after a CCD operation and an intrathecal injection of the inhibitor of palmitoylation (2-bromopalmitate [2-BP]). The acyl-biotinyl exchange method, Western blotting, and coimmunoprecipitation were used to investigate the effects of pain processing and the expression of levels of NR2B palmitoylation and phosphorylation at the spinal level.

RESULTS:

CCD rats had long-lasting thermal hyperalgesia and mechanical allodynia, leading to upregulation of the level of NR2B palmitoylation and phosphorylation at the spinal level. An intrathecal treatment with 2-BP on day 14 after CCD surgery markedly improved pain behaviors and downregulated the expression of NR2B palmitoylation and phosphorylation.

CONCLUSIONS:

These data suggest that upregulated NR2B palmitoylation in CCD-induced neuropathic pain and intrathecal injection of 2-BP could reduce pain behaviors and NR2B phosphorylation. Our findings indicate that spinal NR2B palmitoylation is an important component of CCD-induced neuropathic pain, and it might be a potential target for chronic pain therapy.