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Anesth Analg 2009 109: 986-987.

小儿日间手术中超重/肥胖与胃液特征：禁食指南与肺吸入风险的关系

Overweight/Obesity and Gastric Fluid Characteristics in Pediatric Day Surgery: Implications for Fasting Guidelines and Pulmonary Aspiration Risk

Scott D. Cook-Sather, MD*, Paul R. Gallagher, MA†, Lydia E. Kruge, BA*, Jonathan M. Beus, BSE*, Brian P. Ciampa, BS*, Kevin Conor Welch, MA*, Sina Shah-Hosseini, MSE*, Jieun S. Choi, MD*, Reshma Pachikara, BS*, Kim Minger, BSN, CNOR†, Ronald S. Litman, DO*, and Mark S. Schreiner, MD*

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Anesth Analg 2009 109: 727-736.

背景: 超重/肥胖患儿日间手术前2小时饮用清饮料的安全性尚未验证。健康患儿与肥胖成年人术前禁食2小时残留胃内容(GFVs)较少,通常认为肺吸入风险较低。作者以研究日间手术的超重/肥胖患者残留胃容量流行情况,并探讨体重指数(BMI)与术前禁食时间对GFV或胃液pH值无显著影响。在术前两小时禁食的患儿中,推测超重/肥胖患儿术中将不会增加GFV,并且呕吐肺吸入可能性极低。

方法: 连续调查1000例年龄2-

12岁患儿的人口统计学参数、手术史及身高体重。1000例日间手术病人(年龄2-

12岁)中接受气管内全麻的患儿入选。气管插管后,将14-

18F的胃管插入并抽取胃内容物。记录用药、禁食时间、胃液量、pH值及呕出情况。根据疾病控

制和预防中心生长发育表(2000年)确定对应于年龄和性别的理想体重(理想体重为第

50百分位)和病人的分类:正常(体重25-75百分位数),超重(体重大于等于85

,小于95百分位),或肥胖(体重大于等于95百分位)。

结果: 日间手术的患者中,14.0%的患者体重超重,13.3%为肥胖。肥胖患儿的GFV体重比更低

($P < 0.001$)。当修正的理想体重时,GFV (IBW) 与BMI分类具有一致性(平均0.96ml/kg

,sd 0.71,中位数0.86

ml/kg,四分位间距0.96)。术前服用对乙酰氨基酚和咪唑安定会增加GFV (IBW) ($P =$

0.025和 $P = 0.001$)。低GFV (IBW) 与ASA III ($P = 0.024$),男性 ($P =$

0.012),胃食管反流疾病 ($P = 0.049$),质子泵抑制剂服用 ($P = 0.018$) 相关。

GFV (IBW) 与禁食时间长短无关。年轻人 ($P = 0.005$),体重百分比高 ($P =$

0.036),美洲和非洲种族 ($P =$

0.033)的胃酸浓度较低。8例患者在诱导期发生呕吐(50%的人属于肥胖, $P =$

0.052,75%的人有阻塞性睡眠呼吸暂停综合症, $P =$

0.061)。呕吐的发生是与ASA分级有关而不是禁食时间长短 ($P =$

0.006)。并且患者没有发生肺吸入。

结论 小儿日间手术病人中有27%患儿为超重/肥胖。无论BMI和禁食时间长短,这些患儿在术前

两小时可饮用清饮料(1 ml/kg)。偶尔的呕吐发生与禁食时间长短没有关系。

(陈毓雯 译 陈杰 校)

BACKGROUND: The safety of 2-h preoperative clear liquid fasts has not been established for overweight/obese pediatric day surgical patients. Healthy children and obese adults who fasted 2 h have small residual gastric fluid volumes (GFVs), which are thought to reflect low pulmonary aspiration risk. We sought to measure the prevalence of overweight/obesity in our day surgery population. We hypothesized that neither body mass index (BMI) percentile nor fasting duration would significantly affect GFV or gastric fluid pH. In children who were allowed clear liquids up until 2 h before surgery, we hypothesized that overweight/obese subjects would not have increased GFV over lean/normal subjects and that emesis/pulmonary aspiration events would be rare.

METHODS: Demographics, medical history, height, and weight were recorded for 1000 consecutive day surgery patients aged 2–12 yr. In addition, 1000 day surgery patients (age 2–12 yr) undergoing general endotracheal anesthesia were enrolled. After tracheal intubation, a 14–18F orogastric tube was inserted and gastric contents evacuated. Medications, fasting interval, GFV, pH, and emetic episodes were documented. Age- and gender-specific Center for Disease Control and Prevention growth charts (2000) were used to determine ideal body weight (IBW = 50th percentile) and to classify patients as lean/normal (BMI 25th–75th percentile), overweight (BMI \geq 85th to $<$ 95th percentile), or obese (BMI \geq 95th percentile).

RESULTS: Of all day surgery patients, 14.0% were overweight and 13.3% were obese. Obese children had lower GFV per total body weight ($P < 0.001$). When corrected for IBW, however, volumes GFV (IBW) were identical across all BMI categories (mean 0.96 mL/kg, sd 0.71; median 0.86 mL/kg, IQR 0.96). Preoperative acetaminophen and midazolam contributed to increased GFV (IBW) ($P = 0.025$ and $P = 0.001$). Lower GFV (IBW) was associated with ASA physical status III ($P = 0.024$), male gender ($P = 0.012$), gastroesophageal reflux disease ($P = 0.049$), and proton pump inhibitor administration ($P = 0.018$). GFV (IBW) did not correlate with fasting duration or age. Decreased gastric fluid acidity was associated with younger

age ($P = 0.005$), increased BMI percentile ($P = 0.036$), and African American race ($P = 0.033$). Emesis on induction occurred in eight patients (50% of whom were obese, $P = 0.052$, and 75% of whom had obstructive sleep apnea, $P = 0.061$). Emesis was associated with increased ASA physical status ($P = 0.006$) but not with fasting duration. There were no pulmonary aspiration events.

CONCLUSIONS: Twenty-seven percent of pediatric day surgery patients are overweight/obese. These children may be allowed clear liquids 2 h before surgery as GFV (IBW) averages 1 mL/kg regardless of BMI and fasting interval. Rare emetic episodes were not associated with shortened fasting intervals in this population.

轻于5Kg的婴儿和新生儿实时超声引导下颈内静脉置管的一个有效的新型皮肤牵引方法

A Novel Skin-Traction Method Is Effective for Real-Time Ultrasound-Guided Internal Jugular Vein Catheterization in Infants and Neonates Weighing Less Than 5 Kilograms

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From the Department of Anesthesiology and Medical Crisis Management, Nagoya City University Graduate School of Medical Sciences, Nagoya City, Aichi, Japan. *Anesth Analg* 2009 109: 754-759.

背景: 小儿患者颈内静脉穿刺较困难, 因为静脉直径小且血管易塌陷。为了颈内静脉穿刺置管方便, 作者研发了一种新的皮肤牵引法 (STM), 颈内静脉穿刺过程中, 皮肤穿刺点向上拉伸。在这项研究中检测了STM是否能增加静脉的横截面积以及是否对颈内静脉穿刺有帮助。

方法: 这项前瞻性研究从2006年12月至2008年6月。28名先天性心脏病手术婴儿和体重<5千克新生儿入组。患儿随机分组, 一组为实验组 (STM组), 另一组为对照组 (非STM组)。在平卧位和10°垂头仰卧位时分别测量运用STM与不运用STM时的右侧颈内静脉的横截面积与直径。破皮后穿刺步骤如下: (一) 第一次血液回流, (二) 插入导引丝 (三) 导管插入。同时研究穿刺标记生效后 (估计生效后穿刺前直径较术前小) 穿刺次数、成功率、并发症以及颈内静脉的塌陷程度。

结果: 两种体位中STM均显著增加颈内静脉的横截面积及前后径。STM组中插入导管需要的时间明显缩短, 主要原因可能由于导引丝插入时间缩短。在STM组中运用改进后的穿刺标记颈内静脉塌陷程度降低。

结论: STM通过扩张颈内静脉及防止静脉塌陷, 使婴儿和体重<5公斤的新生儿的颈内静脉穿刺更便捷。

(陈毓震 译 陈杰 校)

BACKGROUND: Internal jugular vein (IJV) catheterization in pediatric patients is sometimes difficult because of the small sizes of veins and their collapse during catheterization. To facilitate IJV catheterization, we developed a novel skin-traction method (STM), in which the point of puncture of the skin over the IJV is stretched upward with tape during catheterization. In this study, we examined whether the STM increases the cross-sectional area of the vein and thus facilitates catheterization.

METHODS: This was a prospective study conducted from December 2006 to June 2008. We enrolled 28 consecutive infants and neonates weighing <5 kg who underwent surgery for congenital heart disease. The patients were randomly assigned to a group in which STM was performed (STM group) or a group in which it was not performed (non-STM group). The cross-sectional area and diameter of the right IJV in the flat position and 10° Trendelenburg position with and without

applying STM were measured. We determined time from first skin puncture to the following: (a) first blood back flow, (b) insertion of guidewire, and (c) insertion of catheter. Number of punctures, success rate, complications, and degree of IJV collapse during advancement of the needle (estimated as decrease of anteroposterior diameter during advancement of the needle compared with the diameter before advancement) were also examined.

RESULTS: STM significantly increased the cross-sectional area and the anteroposterior diameter of the IJV in both positions. The time required to insert the catheter was significantly shorter in the STM group, probably mainly due to a shorter guidewire insertion time. The degree of IJV collapse during advancement of the needle was much lower in the STM group.

CONCLUSIONS: STM facilitates IJV catheterization in infants and neonates weighing <5 kg by enlarging the IJV and preventing vein collapse.

增加异氟烷的吸入时程可以降低7天而非60天大鼠的最低肺泡麻醉浓度

Increasing the Duration of Isoflurane Anesthesia Decreases the Minimum Alveolar Anesthetic Concentration in 7-Day-Old but Not in 60-Day-Old Rats

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背景:作者在研究大鼠神经系统毒性时发现当增加异氟烷的吸入时程时,其最低肺泡麻醉浓度(MAC)随之降低了,这种变化发生在7天大鼠但60天大鼠却不会发生。对7天大鼠麻醉5min,其MAC为3.5%,而麻醉4小时后的大鼠其MAC已降至1.3%。本文作者研究了其药效或药代因素是否介导这种变化。

方法:测定7天大鼠异氟烷在MAC时的吸入压和脑分压作为麻醉维持的依据。对60天大鼠,测定异氟烷在MAC时的部分吸入压力作为吸入维持的依据。最后,测定给予纳洛酮1mg/kg并推尽MAC的起台时间(通过夹尾试验)对7天大鼠的影响。

结果:对于7天大鼠,MAC的吸入压和脑分压在1至4h均下降。吸入压下降了56%,脑分压下降了33%。4小时时,MAC的吸入压接近脑分压(即部分脑分压没有显著变化)。无论是给予1mg/kg的纳洛酮还是把夹尾时间推迟到3小时都无法逆转MAC的下降。对于60天大鼠,MAC时异氟烷的吸入压在1至4小时之间是稳定的。

结论:异氟烷的MAC在1至4小时的麻醉过程中是下降的,这种情况见于7天大鼠而非60天大鼠。药效学和药动学都支持7天大鼠MAC的下降。内啡肽和感觉神经均不参与此药效学的构成。

(李露译 陈杰校)

BACKGROUND: While studying neurotoxicity in rats, we observed that the anesthetic minimum alveolar anesthetic concentration (MAC) of isoflurane decreases with increasing duration of anesthesia in 7-day-old but not in 60-day-old rats. After 15 min of anesthesia in 7-day-old rats, MAC was 3.5% compared with 1.3% at 4 h. We investigated whether kinetic or dynamic factors mediated this decrease.

METHODS: In 7-day-old rats, we measured inspired and cerebral partial pressures of isoflurane at MAC as a function of duration of anesthesia. In 60-day-old rats, we measured inspired partial pressures of isoflurane at MAC as a function of duration of anesthesia. Finally, we determined the effect of administering 1 mg/kg naloxone

and of delaying the initiation of the MAC determination (pinching the tail) on MAC in 7-day-old rats.

RESULTS: In 7-day-old rats, both inspired and cerebral measures of MAC decreased from 1 to 4 h. The inspired MAC decreased 56%, whereas the cerebral MAC decreased 33%. At 4 h, the inspired MAC approximated the cerebral MAC (i.e., the partial pressures did not differ appreciably). Neither administration of 1 mg/kg naloxone nor delaying tail clamping until 3 h reversed the decrease in MAC. In 60-day-old rats, inspired MAC of isoflurane was stable from 1 to 4 h of anesthesia.

CONCLUSIONS: MAC of isoflurane decreases over 1–4 h of anesthesia in 7-day-old but not in 60-day-old rats. Both pharmacodynamic and a pharmacokinetic components contribute to the decrease in MAC in 7-day-old rats. Neither endorphins nor sensory desensitization mediate the pharmacodynamic component.

听觉事件相关电位, 脑电双频指数和熵在区分ICU病人不同镇静水平的差异

Auditory Event-Related Potentials, Bispectral Index, and Entropy for the Discrimination of Different Levels of Sedation in Intensive Care Unit Patients

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背景: 镇静方案-

包括镇静量表的应用, 规律的镇静中止, 可以减少病人机械通气和在ICU的停留时间。由于临床镇静深度的评估是一项劳动密集型且耗时的工作, 并且受镇静剂药理的影响, 脑电生理信号逐渐成为替代指标受到人们的青睐。作者使用听觉事件相关电位(ERPs), 脑电双频指数(BIS)和熵能够区分临床相关镇静水平。

方法: 选取10位在全身麻醉下行胸部或腹部手术的入住ICU的术后病人, 术后即连续记录脑电图、BIS、状态熵(SE)、反应熵(RE)和听觉事件相关电位。镇静水平依据Richmond躁动-镇静评分(RASS)分为几个层面—

5分(极深度镇静), 4分(深度镇静), 3分至1分(中度镇静)和0分(清醒)。镇静方法选择芬丙泊酚和瑞芬太尼靶控输注, 剂量逐渐减少。基础水平的参考在术前或术后几天进行。

结果: 基础水平、RASS 5分、4分、3至1分、0分时BIS值分别为94 [4]

(中位数, 四分位数间距), 47 [15], 68 [9], 75 [10], 88 [6]; 状态熵(SE)分别为87 [3], 46 [10], 60 [22], 74 [21], 87 [5]; 反应熵(RE)分别为97 [4], 48 [9], 71 [25], 81 [18], 96 [3] ($P < 0.05$, Friedman检验)。BIS值和熵值变异性较大。当单独考虑事件相关电位(ERP)

N100波幅时, ERPs在不同镇静水平的变化无统计学意义。但是, 在对ERP进行判别分析包括双变量的主成分分析时, 对于区分深度、中度和重度镇静水平得到的预测概率 P_k 为0.89。对于RE, SE和BIS相应的 P_k 分别为0.88, 0.89和0.85。

结论: 无论事件相关电位(ERPs)还是脑电双频指数(BIS)或熵都不能取代临床标准的镇静评分系统。ERPs和处理后脑电图可以区分全身麻醉后极深度镇静、深度至中度镇静和清醒水平, 两者 P_k 值相似。个体间及个体本身熵和BIS的高变异性使得不能确定靶值范围, 从而限制了其在评估危重病人镇静中的应用。目前: ERPs的变异性尚不清楚。

(李潺译 陈杰校)

BACKGROUND: Sedation protocols, including the use of sedation scales and regular sedation stops, help to reduce the length of mechanical ventilation and

intensive care unit stay. Because clinical assessment of depth of sedation is labor-intensive, performed only intermittently, and interferes with sedation and sleep, processed electrophysiological signals from the brain have gained interest as surrogates. We hypothesized that auditory event-related potentials (ERPs), Bispectral Index® (BIS), and Entropy® can discriminate among clinically relevant sedation levels.

METHODS: We studied 10 patients after elective thoracic or abdominal surgery with general anesthesia. Electroencephalogram, BIS, state entropy (SE), response entropy (RE), and ERPs were recorded immediately after surgery in the intensive care unit at Richmond Agitation-Sedation Scale (RASS) scores of -5 (very deep sedation), -4 (deep sedation), -3 to -1 (moderate sedation), and 0 (awake) during decreasing target-controlled sedation with propofol and remifentanyl. Reference measurements for baseline levels were performed before or several days after the operation.

RESULTS: At baseline, RASS -5, RASS -4, RASS -3 to -1, and RASS 0, BIS was 94 [4] (median, IQR), 47 [15], 68 [9], 75 [10], and 88 [6]; SE was 87 [3], 46 [10], 60 [22], 74 [21], and 87 [5]; and RE was 97 [4], 48 [9], 71 [25], 81 [18], and 96 [3], respectively (all $P < 0.05$, Friedman Test). Both BIS and Entropy had high variabilities. When ERP N100 amplitudes were considered alone, ERPs did not differ significantly among sedation levels. Nevertheless, discriminant ERP analysis including two parameters of principal component analysis revealed a prediction probability P_K value of 0.89 for differentiating deep sedation, moderate sedation, and awake state. The corresponding P_K for RE, SE, and BIS was 0.88, 0.89, and 0.85, respectively.

CONCLUSIONS: Neither ERPs nor BIS or Entropy can replace clinical sedation assessment with standard scoring systems. Discrimination among very deep, deep to moderate, and no sedation after general anesthesia can be provided by ERPs and processed electroencephalograms, with similar P_K s. The high inter- and intraindividual variability of Entropy and BIS precludes defining a target range of values to predict the sedation level in critically ill patients using these parameters. The variability of ERPs is unknown.

压力支持通气 and 双相气道正压通气通过肺血流重分布而改善氧合

Pressure Support Ventilation and Biphasic Positive Airway Pressure Improve Oxygenation by Redistribution of Pulmonary Blood Flow

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背景: 在机械通气时, 自主呼吸启动通过恢复之前萎陷区域的肺泡而改善气体交换。PSV和BIPAP通常使用自主呼吸模式; 但是对于这些辅助机械通气的模式是如何提高肺功能的机理知之甚少。本文作者研究的目的是探讨PSV和BIPAP改善气体交换的机理。

方法:五头猪,用表面活性剂消耗去造急性肺损伤模型,行俯卧位下机械通气。稳定之后,BIPAP开始设定为5 cm H₂O并逐渐提高,最后通气达到6-8ml/kg的潮气量。减轻麻醉深度,同时当自主呼吸大于等于每分通气量的20%时,行PSV或BIPAP+SB一小时(随机顺序)。呼末暂停阶段行整个胸部的螺旋CT,同时记录功能变量。静脉注入荧光微球来标记肺血流,然后用三维重建分析方法评价各种通气模式对肺血流再分布的作用。

结果:急性肺损伤造成肺功能损伤,增加了肺损伤非相关区或通气减弱或无通气($P < 0.05$)。较机械通气通气相比,PSV和BIPAP+SB都能提高氧合,减少静脉混合($P < 0.05$)。尽管如此,自主呼吸会增加相关区的非通气区域,同时伴随着正常通气区域的减少。6个肺区域中5个观察到PSV和BIPAP+SB通气期间肺血流量分布是从损伤非相关区到非肺相关区。

结论:在这个急性肺损伤模型中,PSV或BIPAP+SB的辅助机械通气改善氧合和静脉血混合是由于肺血流流向损伤非肺相关区而不是恢复肺损伤非相关区。

(张婷译 陈杰校)

BACKGROUND: Spontaneous breathing (SB) activity may improve gas exchange during mechanical ventilation mainly by the recruitment of previously collapsed regions. Pressure support ventilation (PSV) and biphasic positive airway pressure (BIPAP) are frequently used modes of SB, but little is known about the mechanisms of improvement of lung function during these modes of assisted mechanical ventilation. We evaluated the mechanisms behind the improvement of gas exchange with PSV and BIPAP.

METHODS: Five pigs (25–29.3 kg) were mechanically ventilated in supine position, and acute lung injury (ALI) was induced by surfactant depletion. After stabilization, BIPAP was initiated with lower continuous positive airway pressure equal to 5 cm H₂O and the higher continuous positive airway pressure titrated to achieve a tidal volume between 6 and 8 mL/kg. The depth of anesthesia was reduced, and when SB represented $\geq 20\%$ of total minute ventilation, PSV and BIPAP + SB were each performed for 1 h (random sequence). Whole chest helical computed tomography was performed during end-expiratory pauses and functional variables were obtained. Pulmonary blood flow (PBF) was marked with IV administered fluorescent microspheres, and spatial cluster analysis was used to determine the effects of each ventilatory mode on the distribution of PBF.

RESULTS: ALI led to impairment of lung function and increase of poorly and nonaerated areas in dependent lung regions ($P < 0.05$). PSV and BIPAP + SB similarly improved oxygenation and reduced venous admixture compared with controlled mechanical ventilation ($P < 0.05$). Despite that, a significant increase of nonaerated areas in dependent regions with a concomitant decrease of normally aerated areas was observed during SB. In five of six lung clusters, redistribution of PBF from dependent to nondependent, better aerated lung regions were observed during PSV and BIPAP + SB.

CONCLUSIONS: In this model of ALI, the improvements of oxygenation and venous admixture obtained during assisted mechanical ventilation with PSV and BIPAP + SB were explained by the redistribution of PBF toward nondependent lung regions rather than recruitment of dependent zones.

健康成人吸入氧浓度和呼末CO₂对于大脑组织氧合指数的影响

The Effect on Cerebral Tissue Oxygenation Index of Changes in the Concentrations of Inspired Oxygen and End-Tidal Carbon Dioxide in Healthy Adult Volunteers

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背景: 作者使用近红外光谱仪行非侵入性的脑组织氧饱和度(ScO_2)监测。 ScO_2 用NIRO 300 波谱仪(Hamamatsu Photonics, Japan)测定, ScO_2 称为脑组织的氧合指数(TOI), 用来评估大脑氧运输和利用之间的平衡。本研究目的是探讨系统性和颅内生理改变对脑组织氧合指数(TOI)的影响。

方法: 研究15名健康志愿者在正常 CO_2 低氧血症和高氧血症及正常氧时的过度通气和通气不足时脑氧。用NIRO 300

波谱仪测定了绝对大脑氧合指数和氧合血红蛋白以及脱氧血红蛋白浓度。同时监测动脉血氧饱和度, 呼末 CO_2 , 心率, 平均动脉血压以及大脑中动脉血流速度。用总的大脑血红蛋白浓度变化计算脑血流量的变化。

结果: 基础脑组织氧合指数为67.3%, 其四分位间距为65.2%-

71.9%。脑组织氧合指数平均下降7.1% (四分位间距5.4%-

9.1%) 时发生低氧血症, 脑组织氧合指数平均增加2.3% (四分位间距2.0%-

2.5%) 产生高氧血症 ($P < 0.0001$)。通气不足导致TOI减少基础值的2.1% (四分位间距1.3%-

-3.3%) ($P < 0.0001$), 过度通气导致TOI增加2.6% (四分位间距1.4%-

3.7%) ($P < 0.0001$)。氧饱和度 ($P < 0.0001$), 呼末 CO_2 ($P < 0.0001$), 大脑血流量 ($P = 0.0003$), 以及平均动脉压 ($P = 0.03$) 都显著影响了TOI。大脑中动脉血流速度 ($P = 0.7$) 和心率 ($P = 0.2$) 对TOI影响不显著。

结论: TOI能是实时、多点、无创评估大脑氧运输和利用的简易监测仪。然而, TOI是个复杂的变量, 它会受到氧饱和度和呼末 CO_2 的影响, 以及平均动脉压和大脑血流量改变的影响, 但后者影响程度较小。临床医生应注意全身和颅内生理改变对TOI的影响, 从而在临床监测中合理解释TOI的变化。

(张婷 译 陈杰 校)

BACKGROUND: A variety of near-infrared spectroscopy devices can be used to make noninvasive measurements of cerebral tissue oxygen saturation (ScO_2). The ScO_2 measured by the NIRO 300 spectrometer (Hamamatsu Photonics, Japan) is called the cerebral tissue oxygenation index (TOI) and is an assessment of the balance between cerebral oxygen delivery and utilization. We designed this study to investigate the effect of systemic and intracranial physiological changes on TOI.

METHODS: Fifteen healthy volunteers were studied during isocapnic hyperoxia and hypoxemia, and normoxic hypercapnea and hypocapnea. Absolute cerebral TOI and changes in oxy- and deoxyhemoglobin concentrations were measured using a NIRO 300 spectrometer. Changes in arterial oxygen saturation (SaO_2), $ETCO_2$, heart rate, mean arterial blood pressure (MBP), and middle cerebral artery blood flow velocity (V_{mca}) were also measured during these physiological challenges. Changes in cerebral blood volume (CBV) were subsequently calculated from changes in total cerebral hemoglobin concentration.

RESULTS: Baseline TOI was 67.3% with an interquartile range (IQR) of 65.2%–71.9%. Hypoxemia was associated with a median decrease in TOI of 7.1% (IQR –9.1% to –5.4%) from baseline ($P < 0.0001$) and hyperoxia with a median increase of 2.3% (IQR 2.0%–2.5%) ($P < 0.0001$). Hypocapnea caused a reduction in TOI of 2.1% (IQR –3.3% to –1.3%) from baseline ($P < 0.0001$) and hypercapnea an increase of 2.6% (IQR 1.4%–3.7%) ($P < 0.0001$). Changes in SaO_2 ($P < 0.0001$), $ETCO_2$ ($P < 0.0001$), CBV ($P = 0.0003$), and MBP ($P = 0.03$) were significant

variables affecting TOI. Changes in V_{mca} ($P = 0.7$) and heart rate ($P = 0.2$) were not significant factors.

CONCLUSION: TOI is an easy-to-monitor variable that provides real-time, multisite, and noninvasive assessment of the balance between cerebral oxygen delivery and utilization. However, TOI is a complex variable that is affected by SaO_2 and $ETCO_2$, and, to a lesser extent, by MBP and CBV. Clinicians need to be aware of the systemic and cerebral physiological changes that can affect TOI to interpret changes in this variable during clinical monitoring.

持续非同步电刺激对低温痛阈的影响

The Impact of Asynchronous Electroacupuncture Stimulation Duration on Cold Thermal Pain Threshold

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持续非同步电刺激对痛阈减退。健康志愿者随机接受不同的非同步电刺激在5mA电流下，交替使用低高2/100赫兹的频率，持续时间分别为0，20，30或40min。应用实验性人冷温痛阈模型，结果发现与0-，20-，或40-min刺激 ($P < 0.05$) 相比，30min的非同步2 / 100赫兹的刺激，产生最显著的痛阈减退效果并在持续至少60min。结论：非同步电刺激最佳时间是30min。

(张燕 译 陈杰 校)

The durations of asynchronous electroacupuncture can affect the resultant hypoalgesia. Healthy volunteers were randomized to receive different durations (0 min, 20 min, 30 min, or 40 min) of asynchronous electroacupuncture stimulations (alternating low/high [2/100 Hz] frequency at 5 mA). Using a human experimental cold thermal pain threshold model, we found that 30 min of asynchronous 2/100 Hz stimulation resulted in the most significant hypoalgesic effect that was sustained for at least 60 min after stimulation compared with 0-, 20-, or 40-min stimulations ($P < 0.05$). We conclude that the most optimal duration for asynchronous electroacupuncture stimulation is 30 min.

中枢给予二甲胺四环素和利鲁唑预防大鼠吗啡导致的耐受

Central Administration of Minocycline and Riluzole Prevents Morphine-Induced Tolerance in Rats

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背景:长期使用阿片类药物导致镇痛耐受的耐受，这种现象的神经生物学机制并不完全清楚。在这项研究中，作者评估中枢给予二甲胺四环素（四环素衍生物）和利鲁唑（谷氨酰胺拮抗剂）对大鼠吗啡导致耐受的影响。

方法:每日注射吗啡(10 mg/kg, IP)的大鼠随机分为生理盐水组(10 μ L/rat, 侧脑室注射[ICV])，1% 聚山梨醇酯80组(10

$\mu\text{L/rat}$ ，[ICV])，二甲苄四霉素组(60, 120, 和240 $\mu\text{g}/10 \mu\text{L}$, ICV)和利鲁唑组(20, 40, 80 $\mu\text{g}/10 \mu\text{L}$ per rat, ICV)。用热盘仪($55^\circ\text{C} \pm 0.5^\circ\text{C}$)评估大鼠对伤害性刺激的反应。记录大鼠舔足反应时间为热盘潜伏期。每天记录每只大鼠基础潜伏期，然后注射吗啡(10 mg/kg)。20min后给予上述药物10min后测定潜伏期。

结果：侧脑室注射二甲苄四霉素和利鲁唑延迟了吗啡导致的耐受。对照组在8天后对吗啡完全耐受，而在二甲苄四霉素组(120 $\mu\text{g}/10 \mu\text{L}$ per rat) 和利鲁唑组(80 $\mu\text{g}/10 \mu\text{L}$ per rat)第3天才耐受。另外，二甲苄四霉素和利鲁唑增强了吗啡的镇痛作用。

结论：二甲苄四霉素对一氧化氮和谷氨酸系统的作用和利鲁唑对谷氨酸系统的作用是延迟吗啡耐受的重要机制。

(唐颖 译 陈杰 校)

BACKGROUND: Long-term exposure to opiates induces tolerance to the analgesic effect. The neurobiological mechanism of this phenomenon is not completely clear. In this study, we evaluated the effects of central administration of minocycline (a tetracycline derivative) and riluzole (an antiglutamatergic drug) on morphine-induced tolerance in rats.

METHODS: Groups of rats received daily morphine (10 mg/kg, IP) in combination with saline (10 $\mu\text{L/rat}$, intracerebroventricular [ICV]) or 1% Tween 80 (10 $\mu\text{L/rat}$, ICV) or minocycline (60, 120, and 240 $\mu\text{g}/10 \mu\text{L}$ per rat, ICV) or riluzole (20, 40, 80 $\mu\text{g}/10 \mu\text{L}$ per rat, ICV). Nociception was assessed using hotplate apparatus ($55^\circ\text{C} \pm 0.5^\circ\text{C}$). Hotplate latency was recorded when the rat licked its hindpaw. Baseline latencies were determined once per day for each rat, then morphine (10 mg/kg) was injected. After 20 min, the above-mentioned drugs were administered and postdrug latency was measured 10 min after the injection of drugs or vehicles.

RESULTS: Results showed that ICV administration of minocycline and riluzole delayed morphine-induced tolerance. Morphine tolerance was complete after 8 days in the control groups but was complete in the groups treated with minocycline (120 $\mu\text{g}/10 \mu\text{L}$ per rat) and riluzole (80 $\mu\text{g}/10 \mu\text{L}$ per rat) on the 13th day. In addition, our results showed that minocycline and riluzole increased the total analgesic effect of morphine (area under the curve of the percentage of maximal possible effect values).

CONCLUSION: The effects of minocycline on nitric oxide and the glutamatergic system and the effect of riluzole on the glutamate system are potentially important mechanisms in delaying morphine-induced tolerance.

大鼠炎症和神经病理痛模型中外周活性钠通道(Na_v1.7)阻滞剂逆转痛觉过敏和异常性疼痛

A Peripherally Acting Na_v1.7 Sodium Channel Blocker Reverses Hyperalgesia and Allodynia on Rat Models of Inflammatory and Neuropathic Pain

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背景：初级感觉神经元上的电压门控钠通道(Nav1)可以影响动作电位的产生和传播的兴奋性。最近，人类基因组数据表明，一个钠离子通道亚型，Nav1.7，在疼痛中起着重要作用。作者对此研究苯基哌啶(BZP)抗伤害效应，非中枢神经系统(CNS)的小分子渗透物Nav1.7比Nav1.8和Nav1.5有更高亲和力和优先选择性。

方法:与标准镇痛药作比较,评估BZP在大鼠炎症和神经病理疼痛临床前模型中效力。使用福氏佐剂炎症性疼痛模型及脊神经损伤性神经性疼痛模型。另行苯基哌嗪运动协调试验,以评估其对中枢神经系统的作用。

结果:在临床前慢性疼痛模型中,苯基哌嗪效果与当前的镇痛药相当。在福氏佐剂的模式中,苯基哌嗪生产的防止痛觉过敏作用与非甾体抗炎药相当,而在脊神经损伤模型中,苯基哌嗪生产的止痛作用与加巴喷丁和美西律相当。与中枢神经系统渗透化合物加巴喷丁和美西律不同,苯基哌嗪并没有引起任何运动协调能力障碍。

结论:这些数据表明,经外周作用的钠通道阻滞剂,首先通过Nav1.7发生作用,可缓解慢性临床疼痛,且不引起目前疼痛治疗中常见的中枢神经系统副作用。

(杨焱娟 译 陈杰 校)

BACKGROUND: Voltage-gated sodium channels (Na_v1) are expressed in primary sensory neurons where they influence excitability via their role in the generation and propagation of action potentials. Recently, human genetic data have shown that one sodium channel subtype, $Na_v1.7$, plays a major role in pain. We performed these studies to characterize the antinociceptive effects of *N*-[(*R*)-1-((*R*)-7-chloro-1-isopropyl-2-oxo-2,3,4,5-tetrahydro-1*H*-benzo[*b*]azepin-3-ylcarbamoyl)-2-(2-fluorophenyl)-ethyl]-4-fluoro-2-trifluoromethyl-benzamide (BZP), a non-central nervous system (CNS) penetrant small molecule with high affinity and preferential selectivity for $Na_v1.7$ over $Na_v1.8$ and $Na_v1.5$.

METHODS: BZP was evaluated in rat preclinical models of inflammatory and neuropathic pain and compared with standard analgesics. Two models were used: the complete Freund's adjuvant model of inflammatory pain and the spinal nerve ligation model of neuropathic pain. BZP was also evaluated in a motor coordination assay to assess its propensity for CNS side effects.

RESULTS: In preclinical models of chronic pain, BZP displayed efficacy comparable with that of leading analgesics. In the complete Freund's adjuvant model, BZP produced reversal of hyperalgesia comparable with nonsteroidal antiinflammatory drugs, and in the spinal nerve ligation model, BZP produced reversal of allodynia comparable with gabapentin and mexiletine. Unlike the CNS penetrant compounds gabapentin and mexiletine, BZP did not induce any impairment of motor coordination.

CONCLUSIONS: These data suggest that a peripherally acting sodium channel blocker, preferentially acting through $Na_v1.7$, could provide clinical relief of chronic pain without the CNS side effects typical of many existing pain treatments.

全膝关节成形术后细胞因子基因表达:手术部位与循环中的嗜中性粒细胞反应

Cytokine Gene Expression After Total Hip Arthroplasty: Surgical Site versus Circulating Neutrophil Response

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背景:术后细胞因子和趋化因子在手术创口部位释放,导致术后疼痛,局部炎症,和组织修复。伤口部位多种类型细胞释放新细胞因子/趋化因子,然而,这些分子的单个细胞来源还不清楚。作者希望能更好地了解在全膝关节术后最初阶段,嗜中性粒细胞-细胞因子/趋化因子在手术伤口部位基因表达的作用。

方法: 收集了6位经过标准全髋关节成形术后24小时内的关节引流液。另外,采集术前和术后24小时的静脉血。将嗜中性粒细胞分离,萃取全部RNA,生成生物标记RNA探针。探针包括将近100个寡核苷酸序列表达各种各样人类的细胞因子/趋化因子或者受体蛋白的微阵列cDNA杂交。在微阵列中证实可以看见基因表达的各种改变是通过逆转录聚合酶链反应。

结果: 在分析关节引流嗜中性粒细胞的微阵列中,和术前血中的嗜中性粒细胞相比,白细胞介素1受体拮抗剂(IL1RN),白细胞介素18受体

(IL18R1),巨噬细胞迁移抑制因子(MIF),巨噬细胞炎性蛋白3 α (CCL20)上调,但是,白细胞介素8受体

(IL8RB/CXCR2)却始终都是下调的。所有的这些改变被证实是由逆转录聚合酶链反应引起的。

结论: 和术前循环中的嗜中性粒细胞相比,全髋关节成形术后24小时内,伤口部位中的嗜中性粒细胞有明显的细胞因子基因表达。当我们知道这些改变以后,我们就可以在不削弱伤口愈合的情况下,通过调节嗜中性粒细胞的活性来减少术后疼痛和炎症。

(陈灵科 译 陈杰 校)

BACKGROUND: After surgery, cytokines and chemokines are released at the surgical wound site, which can contribute to postoperative pain, local inflammation, and tissue repair. Multiple cell types are present that can release cytokines/chemokines at the wound site and, thus, the exact cellular source of these molecules is unclear. We sought to better understand the contribution of neutrophils to cytokine/chemokine gene expression at the surgical wound site during the initial postsurgery phase of total hip arthroplasty (THA).

METHODS: Hip drain fluid was collected at 24 h postsurgery from six patients undergoing standardized THA. In addition, venous blood was collected presurgery and 24 h postsurgery. Neutrophils were isolated, total RNA extracted, and a biotinylated cRNA probe generated. The probes were hybridized with a cDNA microarray containing approximately 100 oligonucleotide sequences representing various human cytokines/chemokines or receptor genes. Changes in gene expression seen in the microarray were verified by reverse transcription polymerase chain reaction.

RESULTS: In the microarray analysis of hip drain neutrophils, interleukin-1 receptor antagonist (IL1RN), interleukin-18 receptor 1 (IL18R1), macrophage migration inhibitory factor (MIF), and macrophage inflammatory protein 3 α (CCL20) were upregulated, whereas interleukin-8 receptor β (IL8RB/CXCR2) was consistently downregulated, compared with presurgery blood neutrophils. All of these changes were confirmed by reverse transcription polymerase chain reaction.

CONCLUSION: There is a distinct cytokine gene expression profile in neutrophils at the THA surgical wound site at 24 h postsurgery when compared with that found in presurgery circulating neutrophils. Understanding these changes may allow us to knowledgeably manipulate neutrophil activity to reduce postoperative pain and inflammation without impairing wound healing.

区域麻醉应用于血管通路手术

Regional Anesthesia for Vascular Access Surgery

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背景: 大约25%的最初的动静脉瘘(AVF)建立术失败是由于血管的形成或是不能建立适当的动静脉管径和合适的血流量。瘘管的形成受病人个体差异和手术技术的影响,但是增加静脉直径和提高

瘵血流量是作为一个成功的动静脉瘵手术最重要的因子。在血管外科手术使用的麻醉技术（局监，区域阻滞，和全身麻醉）可以影响这些因素和瘵的失功。

方法：作者在PubMed/

MEDLINE数据库中用关键词进行文献检索。七篇文章提到了麻醉对动静脉瘵建立的作用，包括交感神经阻滞，静脉扩张，血流速率，不良预后，或通畅率，本文对其综述。

结果：区域阻滞后血管扩张可见于头静脉及贵要静脉。血管舒张的特点有助瘵的选止。在术中和术后，使用区域阻滞，与其他麻醉方法相比，可以明显增加瘵血流量。较强的交感神经阻滞促进血管扩张，降低血管痉挛。在动静脉瘵建立中使用区域阻滞技术产生了更短的瘵形成时间，更低的失败率，以及较高的通畅率。

结论：区域阻滞产生显著的血管扩张，增加瘵血流量，如交感神经影响，从而提高血管通道手术的成功率及缩短瘵形成时间。然而，在比较不同麻醉方法之间的差异，我们还需要一个大规模，前瞻性的临床试验来验证这些结果。

（张蕾 译 陈杰 校）

BACKGROUND: Approximately 25% of initial arteriovenous fistula (AVF) placements will fail as a result of thrombosis or failure to develop adequate vessel size and blood flow. Fistula maturation is impacted by patient characteristics and surgical technique, but both increased vein diameter and high fistula blood flow rates are the most important predictors of successful AVFs. Anesthetic techniques used in vascular access surgery (monitored anesthesia care, regional blocks, and general anesthesia) may affect these characteristics and fistula failure.

METHODS: We performed a literature search using key words in the PubMed/MEDLINE database. Seven articles that related to the effects of anesthesia on AVF construction, including sympathetic block, vein dilation, blood flow, adverse outcomes, or patency rates, comprised the sources for this review.

RESULTS: Significant vasodilation after regional block administration is seen in both the cephalic and basilic veins. These vasodilatory properties may assist with AVF site selection. In the intraoperative and postoperative periods, use of a regional block, compared with other anesthetic techniques, resulted in significantly increased fistula blood flow. The greater sympathetic block contributed to vessel dilation and reduced vasospasm. Use of regional techniques in AVF construction yielded shorter maturation times, lower failure rates, and higher patency rates.

CONCLUSION: Use of regional blocks may improve the success of vascular access procedures by producing significant vasodilatation, greater fistula blood flow, sympathectomy-like effects, and decreased maturation time. However, a large-scale, prospective, clinical trial comparing the different anesthetic techniques is still needed to verify these findings.

腹横肌平面阻滞的解剖研究：Petit腰部三角及邻近神经的定位

An Anatomical Study of the Transversus Abdominis Plane Block: Location of the Lumbar Triangle of Petit and Adjacent Nerves

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背景：腹横肌区域（TAP）阻滞是为前侧腹壁镇痛的一项新技术。以往很多的研究都以Petit腰三角作为阻滞的标志。在本次尸体解剖中，作者确定了Petit腰三角的精确定位和大小，并找出了TAP阻滞所影响的神经。

方法：

26具尸体标本可触及可靠的表面标志来估计单侧Petit腰三角位置。同时，也通过一系列的解剖来暴露TAP阻滞的神经。

结果：沿着腋中线，髂嵴到Petit腰三角底端中点的平均距离在皮下组织水平是6.9cm（范围4.5-9.2cm），相应的，在皮肤表面则是9.3cm（范围4-15.1cm）。Petit腰三角中点距髂嵴1.4cm。在Petit腰三角方位，TAP的深度为0.5-4cm，而在腋中线为0.5-

2cm。Petit腰三角的平均大小是2.3cm*3.3cm*2.2cm，其平均面积为 $3.63 \pm 1.93 \text{ cm}^2$ 。在我们解剖的三具尸体标本中TAP阻滞的神经侧支（与）腰三角（相连）。偶然发现66%的标本其Petit腰三角都包含了肋下动脉的小分支。

结论：在本项研究中，这些标本的Petit腰三角（位置）比文献记载的要稍后。Petit腰三角位置变异很大且面积较小。本研究中在Petit腰三角被阻滞的相关神经并未进入腹背肌区域。相对的，在腋中线上，所有的神经都进入了腹背肌区域。

（邹巧群 译 陈杰 校）

BACKGROUND: The transversus abdominis plane (TAP) block is a new technique for providing analgesia to the anterior abdominal wall. Most previous studies have used the lumbar triangle of Petit as a landmark for the block. In this cadaveric study, we determined the exact position and size of the lumbar triangle of Petit and identified the nerves affected by the TAP block.

METHODS: The position of the lumbar triangle of Petit was assessed unilaterally in 26 cadaveric specimens relative to reliably palpable surface landmarks. In addition, a series of dissections were performed to explore the course of the nerves blocked by the TAP.

RESULTS: The mean distance from the midaxillary line along the iliac crest to the center of the base of the lumbar triangle of Petit at the level of the subcutaneous tissue and over the skin surface was 6.9 cm (range, 4.5–9.2 cm) and 9.3 cm (range, 4–15.1 cm), respectively. The center of the lumbar triangle of Petit was 1.4 cm above the iliac crest. The depth of the TAP at the lumbar triangle of Petit position was 0.5–4 cm and at the midaxillary line it was 0.5–2 cm. The average size of the lumbar triangle of Petit was 2.3 cm x 3.3 cm x 2.2 cm, with an average area of $3.63 \pm 1.93 \text{ cm}^2$. The three cadaveric specimens we explored showed the nerves blocked by TAP passed lateral to the triangle. An incidental finding was that in 66% of specimens the lumbar triangle of Petit contained small branches of the subcostal artery.

CONCLUSIONS: The lumbar triangles of Petit found in the specimens in this study were more posterior than the literature suggests. The position of the lumbar triangle of Petit varies largely and the size is relatively small. The relevant nerves to be blocked had not entered the TAP in the specimens in this study at the point of the lumbar triangle of Petit. At the midaxillary line, however, all the nerves were in the TAP.

关于儿童围手术期应用视觉模拟量表（VAS）—焦虑心理测试有效性的研究——临床实践常规中使术后疼痛管理最优化的一個特定有用的工具

The Perioperative Validity of the Visual Analog Anxiety Scale in Children: A Discriminant and Useful Instrument in Routine Clinical Practice to Optimize Postoperative Pain Management

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背景：由于儿童的焦虑情绪会影响其对疼痛的感知，因此在临床实践中应该有一个特定的、有用的、准确度高的工具来评估围手术期的焦虑情绪，从而优化疼痛管理。在本次研究中，我们应用视觉模拟量表（VAS）——焦虑心理测试对儿童的情绪进行评估，并研究其在临床实践中的围手术期相关性。

方法：100位行择期全麻手术的儿童被纳入研究范围。在四个时间点进行测量，将视觉模拟量表（VAS）——

焦虑测试结果与以下三个量表测量结果做对比，包括两个版本的Spielberger心理状态问卷调查（青年焦虑品质状态调查表[STAIY]和儿童焦虑品质状态调查表[STAI C]）以及Yale围手术期焦虑量表修订版。另外用视觉模拟量表（VAS）对儿童的疼痛、父母的焦虑情绪以及父母代表儿童所表述的焦虑情绪进行评估。

结果：儿童焦虑品质状态调查表[STAI C]与视觉模拟量表（VAS）——焦虑测试两者间的相关性在出院当日最为明显。儿童焦虑品质状态调查表[STAI C]不同时间点间的变化并不十分明显，而视觉模拟量表（VAS）——焦虑测试不同时间点间的变化在7-11岁和12-

16岁这两个年龄组的敏感度尤为高。参考Yale围手术期焦虑量表修订版，将视觉模拟量表（VAS）——

焦虑测试的受试者特征性曲线上30定义为区分焦虑严重与否的截止点。当儿童在术后焦虑时（VAS ≥ 30 ），疼痛水平也明显增加。而且当父母焦虑时，儿童的焦虑以及疼痛将更加严重。

结论：对于7-16岁的儿童而言，视觉模拟量表（VAS）——

焦虑测试是一个评估围手术期焦虑情绪非常有用且准确度高的工具。由于儿童及父母的焦虑情绪对于儿童术后疼痛会产生影响，因此建议推荐术后临床实践中常规使用视觉模拟量表（VAS）——

焦虑测试，从而使焦虑情绪以及疼痛达到最优化的处理。

（单嘉琪译 薛张纲校）

BACKGROUND: Because children's anxiety influences pain perception, perioperative anxiety should be evaluated in clinical practice with a unique, useful, and valid tool to optimize pain management. In this study, we evaluated psychometric properties of the visual analog scale (VAS)-anxiety for children and to study its perioperative relevance in clinical practice.

METHODS: One hundred children scheduled for elective surgery and general anesthesia were included. VAS-anxiety was measured at four timepoints and compared with both versions of State Spielbergers' questionnaires (State-Trait Anxiety Inventory for Youth [STAIY] and State-Trait Anxiety Inventory for Children [STAI C]) and the modified Yale Preoperative Anxiety Scale. Children's pain, parents' anxiety, and parents' proxy report of children's anxiety were evaluated using VAS.

RESULTS: The correlation between STAIC and VAS-anxiety was significant on the day of discharge. Moreover, changes over time were not significant with STAIC, whereas VAS-anxiety was significantly sensitive to changes over time in the two groups of age (7-11 yr and 12-16 yr). A receiver operating characteristic curve, using modified Yale Preoperative Anxiety Scale as reference, determined a VAS-anxiety cutoff at 30 to identify high-anxiety groups. Pain levels were significantly higher when children were anxious (VAS ≥ 30) in the postoperative period. Moreover, children's anxiety and pain were higher when parents were anxious.

CONCLUSION: VAS-anxiety is a useful and valid tool to assess perioperative anxiety in children aged 7-16 yr. The influence of children's and parents' anxiety on children's postoperative pain suggests that VAS-anxiety should be recommended routinely for postoperative clinical practice to optimize anxiety and pain management.

常规使用鼻胃管不减少术后恶心与呕吐

Routine use of nasogastric tubes does not reduce postoperative nausea and vomiting.

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虽然现有的数据资料不相一致，但人们仍建议通过常规使用鼻胃管来预防术后的恶心与呕吐。为此，此项研究对该假说进行了检验，即常规使用鼻胃管并不减少术后恶心呕吐的发生。本研究基于的数据资料源于一包含4055名患者的大型试验，其最初被设计用于量化联合止吐疗法对于预防术后恶心呕吐的效力。

分析则采用倾向性评分对病例进行匹配以确保各组基线因素间相互可比。将术中和围手术期使用鼻胃管的患者分别与不使用鼻胃管的病患按各自所存在的潜在混杂因素进行匹配。运用倾向性评分确定匹配的为1032名术中或不使用鼻胃管的患者和176名围手术期使用或不使用鼻胃管的病患。在术中组中，使用和不使用鼻胃管的患者其术后恶心呕吐的发生率分别为44.4%和41.5%（ $P=0.35$ ），近似地，围手术期组为27.8%和31.3%（ $P=0.61$ ）。根据研究结果所提供的证据表明常规使用鼻胃管并不减少术后恶心呕吐的发生率。

（范羽译 薛张纲校）

Routine use of a nasogastric (NG) tube has been suggested to prevent postoperative nausea and vomiting (PONV) despite conflicting data. Accordingly, we tested the hypothesis that routine use of a NG tube does not reduce PONV. Our work is based on data from a large trial of 4055 patients initially designed to quantify the effectiveness of combinations of antiemetic treatments for the prevention of PONV. This analysis uses propensity scores for case matching to ensure group comparability on baseline factors. Intraoperative NG tube use patients and perioperative NG tube use patients were respectively matched to nonuse patients on all available potential confounders. Matched-pairs were identified using propensity scores for 1032 patients with or without intraoperative NG tube use and 176 patients with or without perioperative NG tube use. The incidences of PONV in the intraoperative group were 44.4% vs 41.5% ($P = 0.35$) with and without tube use, respectively, and 27.8% vs 31.3% ($P = 0.61$) in the perioperative group. Our results provide evidence that routine use of a NG tube does not reduce the incidence of PONV.

肥胖病人中罗库溴铵用量应该依照实际体重还是理想体重？

Should dosing of rocuronium in obese patients be based on ideal or corrected body weight?

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背景：药代动力学研究表明肥胖病人的罗库溴铵用量应该按照理想体重计算。但是这有可能会造成药物起效时间延长以及气管插管条件下降。本次研究中，我们比较了在肥胖病人中，三种不同插管剂量下，罗库溴铵的起效时间，插管条件以及维持时间。

方法：研究对象为择期行腹腔镜下胃囊带术或胃旁路术的肥胖病人。平均体重均数为44(34-

72)/kg/m²。麻醉采用丙泊酚复合瑞芬太尼。将41名研究对象随机分为三组各17名。第一组病人按理想体重给予0.6mg/kg的剂量。第二组按理想体重的120%给予0.6mg/kg的罗库溴铵，第三组按理想体重的140%给予剂量。按照理想体重的140%计算，丙泊酚给予200mg的负荷剂量后按5mg/kg/h的速率输注；瑞芬太尼按1μg/kg/min的速率输注。神经肌肉传导功能用四连串神经刺激以及加速度法监

测。将四连串神经刺激后出现第四个震颤的时间定义为作用持续时间，并将其作为主要的终止标准。

结果：三组的平均作用时间分别为32(18-49)分钟，38(25-66)以及42(24-66)。在理想体重组和140%理想体重组间有显著性差异 $P=0.001$ 。起效时间(85s,84s,80s)及90s后插管条件在三组间没有显著差异。

结论：行胃囊带术或胃旁路术的肥胖病人中，按理想体重计算给予罗库溴铵可以提供较短的作用时间而不会明显的影响起效时间及气管插管条件。

(黄剑译 薛张纲校)

BACKGROUND: Pharmacokinetic studies in obese patients suggest that dosing of rocuronium should be based on ideal body weight (IBW). This may, however, result in a prolonged onset time or compromised conditions for tracheal intubation. In this study, we compared onset time, conditions for tracheal intubation, and duration of action in obese patients when the intubation dose of rocuronium was based on three different weight corrections.

METHODS: Fifty-one obese patients, with a median (range) body mass index of 44 (34-72) kg/m², scheduled for laparoscopic gastric banding or gastric bypass under propofol-remifentanyl anesthesia were randomized into three groups. The patients received rocuronium (0.6 mg/kg) based on IBW (IBW group, n = 17), IBW plus 20% of excess weight (corrected body weight [CBW]20% group, n = 17), or IBW plus 40% of excess weight (CBW40% group, n = 17). Propofol was administered as a bolus of 200 mg and an infusion at 5 mg x kg(-1) x h(-1) and remifentanyl was administered at 1.0 microg x kg(-1) x min(-1), both according to CBW40%. Neuromuscular function was monitored with train-of-four nerve stimulation and acceleromyography. The primary end point was duration of action, defined as time to reappearance of the fourth twitch in train-of-four.

RESULTS: The median (range) duration of action was 32 (18-49), 38 (25-66), and 42 (24-66) min in the IBW, CBW20%, and CBW40% groups, respectively ($P = 0.001$ for comparison of the IBW and CBW40% group). There were no significant differences in onset time (85 vs 84 vs 80 s) or in intubation conditions 90 s after administration of rocuronium.

CONCLUSIONS: In obese patients undergoing gastric banding or gastric bypass, rocuronium dosed according to IBW provided a shorter duration of action without a significantly prolonged onset time or compromised conditions for tracheal intubation.

前瞻性调查：上唇咬诊试验结合SMD、TMD和IID对于预估喉镜检查 and 插管法的诊断价值

The diagnostic value of the upper lip bite test combined with sternomental distance, thyromental distance, and interincisor distance for prediction of easy laryngoscopy and intubation: a prospective study.

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背景: 上唇咬合试验(ULBT)准确性与Mallampati气道分级的比较。在这项研究中,我们调查ULBT分别与sternomental距离(SMD),甲颏距离(TMD)和interincisor距离(IID)组合或联合评分相对于单独测试是否能提高对喉镜检查 and 插管术的预估能力。

方法: 在一个前瞻性调查中,随机选择了380名预定行外科手术的患者并予以登记。在麻醉诱导前,进行气道评估,ULBT分类并测定SMD、TMD和IID。诱导后进行喉镜检查,根据Cormack和Lehane分级系统分级,并定义等级3和4为“困难气道”。通过使用接收器进行特征分析,计算出了测试的最佳分界点。终于,这些测试和它们与ULBT组合的敏感性、特异性、确定性和消极性的预估价值和准确性被计算了。

结果: 困难插管率为5% (19例)。ULBT三级, IID < 4.5厘米, TMD < 6.5厘米和SMD < 13厘米定义为预估的困难插管。他们对困难插管的评估无统计学差异 ($P < 0.05$), 但是这些试验和喉镜检查有显著差异 ($P < 0.05$, Mc-Nemar test)。ULBT的特异性和准确性均显著高于单独的TMD, SMD和IID (特异性分别为91.69%, 82.27%, 70.64%和82.27%, 准确率分别为91.05%, 71.32%, 81.84%和76.58%分别)。ULBT和SMD结合可得到最高的灵敏度。

结论: 我们的结论是ULBT的特异性及准确度大大高于其他测试, 可更准确地进行气道评估。但是, ULBT联合其他测试可以更可靠地预测喉镜检查 and 插管。

(李莹译 薛张纲校)

BACKGROUND: Accuracy of upper lip bite test (ULBT) has been compared with the Mallampati classification. In this study, we investigated whether the combination of the ULBT classification with sternomental distance (SMD), thyromental distance (TMD), and interincisor distance (IID) or a composite score can improve the ability to predict easy laryngoscopy and intubation compared with each test alone.

METHODS: In a prospective study, 380 patients who were scheduled for elective surgery were selected randomly and enrolled in the study. Before inducing anesthesia, the airways were assessed, and ULBT class, SMD, TMD, and IID determined. Laryngoscopic view according to the Cormack and Lehane grading system was determined after induction of anesthesia and Grades 3 and 4 defined as "difficult intubation." By using receiver operating characteristic analysis, the best cutoff points of the tests were calculated. Finally, sensitivity, specificity, positive and negative predictive values and accuracy of these tests and their combinations with the ULBT were calculated.

RESULTS: The prevalence of difficult intubation was 5% ($n = 19$). Class III ULBT, IID < 4.5 cm, TMD < 6.5 cm, and SMD < 13 cm were defined as predictors of difficult intubation. There was no significant difference regarding difficult intubation based on gender ($P < 0.05$), whereas there were significant differences between the older tests and laryngeal view ($P < 0.05$, Mc-Nemar test). Specificity and accuracy of the ULBT were significantly higher than TMD, SMD, and IID individually (specificity was 91.69%, 82.27%, 70.64%, and 82.27%, respectively, and accuracy was 91.05%, 71.32%, 81.84%, and 76.58%, respectively). The combination of the ULBT with SMD provided the highest sensitivity.

CONCLUSION: We conclude that the specificity and accuracy of the ULBT is significantly higher than the other tests and is more accurate in airway assessment. However, the ULBT in conjunction with the other tests could more reliably predict easy laryngoscopy or intubation.

维持或停止生命支持的实践和病史记录: 荷兰两个重症监护室的回顾性分析

The Practice of and Documentation on Withholding and Withdrawing Life Support: A Retrospective Study in Two Dutch Intensive Care Units

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目标：重症监护室中死亡或出重症监护室早期死亡的患者，是由我们决定何时继续生命支持何时停止生命支持，并且评估病史来决定是否改变生命支持方面的医嘱。

方法：这是一所大学附属医院和一所综合性教学医院的回顾性研究。该研究分析了2005年死于重症监护室或出重症监护室7天内死亡的病例。

结果：2578例重症监护室病人中，356例（14%）在监护室死亡或是出监护室7天内死亡。9位病人的资料缺失，剩下347例病人资料可供分析。77位病人（22%）死时有完整的生命支持，85例（25%）死时仍维持治疗，185例（53%）死时治疗措施正被撤离。266位病人（77%）的一项或多项生命支持方面的医嘱有变动。但只有8%的病人在改变医嘱后被记录下了能力下降。病人生命支持方面的优先度只在不到四分之一的病例中有记录。近三分之一的病例里没有提到哪一个治疗小组参与了撤除病人生命支持的决定。在有记录的病例里，7%是与病人共同决定的，59%是与病人家属共同决定的。

结论：重症监护室死亡及出重症监护室后短期死亡的患者主要与维持或撤离生命支持相关。放弃所有生命支持的决定的病史记录非常不足。

（姚敏敏译 薛张纲校）

OBJECTIVE: We determined how often life support was withheld or withdrawn in patients who died in the intensive care unit (ICU) or early after ICU discharge and evaluated documentation on decisions regarding these changes in life support orders.

METHODS: This was a retrospective study in a university hospital and a general teaching hospital. Charts of patients who died during ICU stay or within 7 days after ICU discharge in 2005 were reviewed.

RESULTS: Of 2578 admitted patients, 356 patients (14%) died either in the ICU or within 7 days after ICU discharge. For 9 patients data were missing, leaving 347 patients for analysis. Seventy-seven patients (22%) died with full life support, 85 (25%) died while treatment was being withheld, and 185 (53%) patients died while treatment was being withdrawn. One or more changes in life support orders were noted in 266 patients (77%). Only 8% of the patients were recorded to be incapacitated at the time of the change. Patients' preferences regarding life support were documented in less than one-quarter of cases. In approximately one third of cases, it was not documented which member(s) of the ICU team were involved in an end-of-life decision. In the documented cases, end-of-life decisions were made along with the patient (7%) or with the patient's representatives (59%).

CONCLUSION: ICU nonsurvivors and patients who die shortly after ICU discharge predominantly die with orders to withhold or withdraw life support. Documentation on the decisions to forgo full life support is poor.

创伤病人紧急气管内插管的成功案例：一家重要成人创伤转诊中心的10年经验

The Success of Emergency Endotracheal Intubation in Trauma Patients: A 10-Year Experience at a Major Adult Trauma Referral Center

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背景: 紧急气道管理对于很多麻醉医生来说是一项必需的技术。我们研究了一流创伤中心的10年经验, 来判定在入院最初24小时内气管插管尝试的结果。

方法: 我们检查了从1996年7月到2006年6月创伤挂号, 质量管理和账目管理记录, 得出入院1小时内需要气管插管的病人数量, 从而估计在最初24小时内需要气管插管的病人数量。我们回顾了建立外科气道(气管切开或环甲膜切开)的病人资料, 了解这些病人当时的特征和他们不能经口或经鼻插管的原因。

结果: 所有的插管尝试都在对创伤病人处理有经验的麻醉医生的监督下完成。在整个研究期间, 用直接喉镜快速序贯诱导插管作为标准的途径。入院后第一个小时内, 6088个病人接受了插管, 其中21个(0.3%)建立了外科气道。在最初的24小时内, 共进行了大约32000次插管尝试, 总共31名病人建立了外科气道。未预料的上呼吸道解剖异常造成的困难气道是外科气道建立的主要原因。31个病人中的4个死于外伤, 无人因为插管失败死亡。

结论: 对于有经验的麻醉医生来说, 快速序贯诱导后用直接喉镜插管是紧急气道管理非常有效的途径。一个据此设计的公式可以取得高水准的成功。

(俞佳译 薛张纲校)

BACKGROUND: Emergency airway management is a required skill for many anesthesiologists. We studied 10 yr of experience at a Level 1 trauma center to determine the outcomes of tracheal intubation attempts within the first 24 h of admission.

METHODS: We examined Trauma Registry, quality management, and billing system records from July 1996 to June 2006 to determine the number of patients requiring intubation within 1 h of hospital arrival and to estimate the number requiring intubation with the first 24 h. We reviewed the medical record of each patient in either cohort who underwent a surgical airway access procedure (tracheotomy or cricothyrotomy) to determine the presenting characteristics of the patients and the reason they could not be orally or nasally intubated.

RESULTS: All intubation attempts were supervised by an anesthesiologist experienced in trauma patient care. Rapid sequence intubation with direct laryngoscopy was the standard approach throughout the study period. During the first hour after admission, 6088 patients required intubation, of whom 21 (0.3%) received a surgical airway. During the first 24 h, 10 more patients, for a total of 31, received a surgical airway, during approximately 32,000 attempts (0.1%). Unanticipated difficult upper airway anatomy was the leading reason for a surgical airway. Four of the 31 patients died of their injuries but none as the result of failed intubation.

CONCLUSIONS: In the hands of experienced anesthesiologists, rapid sequence intubation followed by direct laryngoscopy is a remarkably effective approach to emergency airway management. An algorithm designed around this approach can achieve very high levels of success.

长效局麻药减弱实验鼠身上FMLP导致的急性肺损伤

Long-Acting Local Anesthetics Attenuate FMLP-induced Acute Lung Injury in Rats

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背景：内皮素—

1是一种肺部疾病介质和强烈的肺血管收缩剂。它是除了血栓烷A₂外的另一个参与肺水肿形成的介质。利多卡因和甲派卡因都减少肺动脉压的升高和肺水肿的发展。我们试验了普鲁卡因、布比卡因和罗哌卡因在实验引起的PAP升高和ET-1释放中所起的效果。

方法：在实验鼠肺部灌注贺氏羟乙基淀粉溶液时测量PAP和肺质量。溶液中加入10⁻²–10⁻⁷

mg/kg的布比卡因、罗哌卡因或普鲁卡因。用酶免疫试验测量灌流液中的ET-1水平，用放免法测量血栓烷A₂的水平。n-甲酰-1-亮氨酸-甲硫基-1-苯丙氨酸用来激活人类中性粒细胞。

结果：布比卡因、罗哌卡因和普鲁卡因显著地减少了PAP的增加（P < 0.05）并且治疗组与假设组相比较肺质量减少了P < 0.05）。长效局麻药布比卡因和罗哌卡因而非普鲁卡因可减少ET-1的水平，产生低的炎症速度，且在10⁻³ to 10⁻⁶ mg/kg的剂量范围内不影响肺结构。

结论：布比卡因和罗哌卡因减少n-甲酰-1-亮氨酸-甲硫基-1-苯丙氨酸诱发的肺动脉高压，减少肺水肿，减少ET-1释放。利多卡因和甲派卡因在降低肺动脉压和减少肺水肿形成上更有效，但长效局麻药还抑制ET-1的耗竭因而增加了抗炎性。

（张玥琪译 薛张纲校）

BACKGROUND: Endothelin-1 (ET-1) is a mediator of lung diseases and a potent pulmonary vasoconstrictor. In addition to thromboxane A₂, it participates in the formation of lung edema. Both lidocaine and mepivacaine attenuate the increase of pulmonary arterial pressure (PAP) and lung edema development. We examined the effects of procaine, bupivacaine, and ropivacaine on experimentally evoked PAP increase and ET-1 release.

METHODS: PAP and lung weight were measured in isolated rat lungs during perfusion with Krebs-Henseleit hydroxyethyl starch buffer. Bupivacaine, ropivacaine, or procaine was added to the solution at concentrations of 10⁻²–10⁻⁷ mg/kg. ET-1 levels were measured in the perfusate by enzyme-immunoassay, and thromboxane A₂ levels were assayed by radioimmunoassay. N-formyl-l-leucine-methionyl-l-phenylalanine was used to activate human polymorphonuclear neutrophils.

RESULTS: Bupivacaine, ropivacaine, and procaine significantly attenuated increases of PAP ($P < 0.05$) and resulted in a reduction of lung weight in these treatment groups compared with the sham group ($P < 0.05$). The long-acting anesthetics bupivacaine and ropivacaine ($P < 0.05$), but not procaine, reduced ET-1 levels, produced low inflammation rates, and did not affect lung structures at doses from 10–3 to 10–6 mg/kg.

CONCLUSION: Bupivacaine and ropivacaine attenuated N-formyl-l-leucine-methionyl-l-phenylalanine-induced PAP, reduced lung edema, and diminished ET-1 release. Lidocaine and mepivacaine are more effective in reducing PAP and edema formation, but long-acting local anesthetics also inhibit ET-1 depletion and therefore have increased anti-inflammatory properties.

深低温可减缓心搏停止后大鼠的小神经胶质细胞的增殖但不影响神经细胞死亡

Deep hypothermia attenuates microglial proliferation independent of neuronal death after prolonged cardiac arrest in rats.

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引言：对于失血性心搏骤停患者进行常规复苏往往无法成功。新的急救措施是通过对心搏骤停病人进行主动脉冲洗诱导深低体温，进而通过体外循环实施后期复苏。一系列颅脑损伤模型证明米诺环素可降低小神经胶质细胞活性而具有神经保护功能。我们假设深低体温和米诺环素可通过减慢神经细胞死亡和小神经胶质细胞的活性来改善大鼠失血性心搏停止的预后。

方法：在异氟醚麻醉下，使大鼠处于致命的失血性休克状态。在心搏停止5分钟后，通过主动脉冲洗诱导低体温。分为三组进行研究：用冰预冷的冲洗液组（IC），与室温相同的冲洗液组（RT），先用米诺环素治疗后再使用与室温相同的冲洗液组（RT-

M）。在心搏停止20分钟后，通过体外循环来完成复苏。评估72小时后的生存数量，总体情况分类（1 = 正常，5 = 死亡），神经功能缺损评分（0%-10% = 正常，100% = 最大缺损），神经细胞死亡情况（Fluoro-Jade C方法）和小神经胶质细胞增生情况（Iba1 免疫染色）。

结果：IC组的大鼠与其他组相比在心搏停止期具有较低的鼓膜温度（IC, 20.9 摄氏度 +/- 1.3 摄氏度; RT, 28.4 摄氏度 +/- 0.6 摄氏度; RT-M, 28.3 摄氏度 +/- 0.7 摄氏度; $P < 0.001$ ）。尽管生存数量在各组相似（RT, 6/9; IC, 6/7; RT-M, 6/11），但在神经预后方面IC组优于其他组（总体情况分类：IC, 1 +/- 1; RT, 3 +/- 1; RT-M, 2 +/- 1; $P < 0.05$; 神经功能缺损评分：IC, 8% +/- 9%; RT, 55% +/- 19%; RT-M, 27% +/- 16%; $P < 0.05$ ）。评估幸存者的组织损伤发现在海马CA1区和齿状回的选择性神经坏死在各

组相似($P = 0.15$)。各组相比，IC组可明显减缓小神经胶质细胞的增殖 ($P < 0.01$)。

结论：在幸存者中，IC组诱导的深度低体温较RT组可带来更好的神经预后。深低体温可减弱小神经胶质细胞活性却不减缓海马神经细胞的死亡。米诺环素对幸存者的神经预后有一定的益处，但是并不减缓大脑小神经胶质细胞的活性。我们的研究结果表明甚低体温可影响失血性心搏停止后小神经胶质细胞的增殖。

(张钊译 薛张纲校)

INTRODUCTION: Conventional resuscitation of exsanguination cardiac arrest (CA) victims is generally unsuccessful. Emergency preservation and resuscitation is a novel approach that uses an aortic flush to induce deep hypothermia during CA, followed by delayed resuscitation with cardiopulmonary bypass. Minocycline has been shown to be neuroprotective across a number of brain injury models via attenuating microglial activation. We hypothesized that deep hypothermia and minocycline would attenuate neuronal death and microglial activation and improve outcome after exsanguination CA in rats.

METHODS: Using isoflurane anesthesia, rats were subjected to a lethal hemorrhagic shock. After 5 min of no flow, hypothermia was induced with an aortic flush. Three groups were studied: ice-cold (IC) flush, room-temperature (RT) flush, and RT flush followed by minocycline treatment (RT-M). After 20 min of CA, resuscitation was achieved via cardiopulmonary bypass. Survival, Overall Performance Category (1 = normal, 5 = death), Neurologic Deficit Score (0%-10% = normal, 100% = max deficit), neuronal death (Fluoro-Jade C), and microglial proliferation (Iba1 immunostaining) in hippocampus were assessed at 72 h.

RESULTS: Rats in the IC group had lower tympanic temperature during CA versus other groups (IC, 20.9 degrees C +/- 1.3 degrees C; RT, 28.4 degrees C +/- 0.6 degrees C; RT-M, 28.3 degrees C +/- 0.7 degrees C; $P < 0.001$). Although survival was similar in all groups (RT, 6/9; IC, 6/7; RT-M, 6/11), neurological outcome was better in the IC group versus other groups (Overall Performance Category: IC, 1 +/- 1; RT, 3 +/- 1; RT-M, 2 +/- 1; $P < 0.05$; Neurologic Deficit Score: IC, 8% +/- 9%; RT, 55% +/- 19%; RT-M, 27% +/- 16%; $P < 0.05$). Histological damage assessed in survivors showed selective neuronal death in CA1 and dentate gyrus, similar in all groups ($P = 0.15$). In contrast, microglial proliferation was attenuated in the IC group versus all other groups ($P < 0.01$).

CONCLUSIONS: Deeper levels of hypothermia induced by the IC versus RT flush resulted in better neurological outcome in survivors. Surprisingly, deep hypothermia attenuated microglial activation but not hippocampal neuronal death. Minocycline had modest benefit on neurologic outcome in survivors but did not attenuate microglial activation in brain. Our findings suggest a novel effect of deep hypothermia on microglial proliferation during exsanguination CA.

外周神经阻滞对大鼠炎症诱导前列腺素E2和环氧化酶表达的影响

The Effect of a Peripheral Block on Inflammation-Induced Prostaglandin E2 and Cyclooxygenase Expression in Rats

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背景:外周炎症性疼痛与脊髓COX-2的增量调节有关, COX-2的增加导致中枢PGE2增加, 而PGE2水平的升高与痛觉过敏的产生相关。在本项研究中, 我们通过大鼠外周炎症模型来评估布比卡因神经阻滞或组织途径给药对脊髓PGE2和COX表达的影响。

方法: 研究中所有大鼠均随机接受三种药物注射: 1)左后爪皮下注射0.2mL2%角叉菜胶或生理盐水, 2)0.2ml0.5%布比卡因或生理盐水行左侧坐骨神经阻滞, 3)组织注射(肩胛间皮下注射0.2ml0.5%布比卡因或生理盐水)。测量局部水肿、温度、机械的痛觉过敏、脑脊液PGE2浓度以及脊髓背根神经节处COX-1和COX-2的表达。

结果: 我们证实布比卡因神经阻滞能减轻炎症疼痛模型中痛觉过敏和局部的炎症反应。这种影响与抑制背根神经节和脊髓中因周围炎症导致的COX-2的增加相关, 随之在脑脊液中PGE2的产生也减少。而组织途径使用布比卡因不能调节痛觉过敏或改变局部炎症反应和COX的表达。

结论: 这些结果强烈表明局麻药通过组织途径和神经阻滞给药产生不同水平的作用效果。

(朱兰芳译 薛张纲校)

BACKGROUND: Peripheral inflammatory pain is associated with an upregulation of spinal cord COX-2 (cyclooxygenase-2), with a subsequent increase in central prostaglandin E2 (PGE2) levels associated with the development of hyperalgesia. In this study, we evaluated the effect of bupivacaine administered via a nerve block or via a systemic route on the spinal expression of PGE2 and COX in a model of peripheral inflammation in rats.

METHODS: All rats randomly received three injections: 1) a left subcutaneous hindpaw injection (0.2 mL with either carrageenan 2% w/v or saline), 2) a left sciatic block (0.2 mL with either bupivacaine 0.5% or saline), and 3) a systemic injection (subcutaneous interscapular with 0.2 mL with either bupivacaine 0.5% or saline). Local edema, thermal, and mechanical hyperalgesia as well as cerebrospinal fluid PGE2 concentration and COX-1 and COX-2 expression in the spinal cord in dorsal root ganglions were measured.

RESULTS: We confirmed that a bupivacaine block attenuates hyperalgesia and local inflammation in a model of inflammatory pain. This effect was associated with an inhibition of the increase in COX-2 expression induced by peripheral inflammation in dorsal root ganglions and cord. The subsequent production of PGE2 in cerebrospinal fluid was also impaired. Systemic bupivacaine did not modify either the hyperalgesia and local inflammation or COX expression.

CONCLUSION: These results constitute a key element strongly suggesting that local anesthetics act at a different level when administered systematically or via a nerve block.

椎管内给予低浓度的阿米曲替林对轴索的作用

The Neuraxial Effects of Intraspinal Amitriptyline at Low Concentrations

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背景：因为阿米曲替林有多种作用，理论上可有用作椎管内麻醉或用来治疗顽固的神经痛。先前有关阿米曲替林安全性的研究并没有发现单剂量给予低于0.5%浓度的阿米曲替林有毒性作用；一些有关阿米曲替林的病理生理假设也提示低浓度使用具有一定的临床作用，但是可能是安全的。因此，我们设计了这项研究，目的是评估椎管内使用有效的最低浓度阿米曲替林的临床及组织学毒性作用。

方法：21条狗随机分为三组，分别在椎管内注射1ml生理盐水（0.9%），0.15%的阿米曲替林，或0.3%的阿米曲替林。麻醉苏醒后1小时和21天后分别对狗进行评估。在第21天，把所有的动物都杀死，提取其脊髓和周围的脑膜组织进行组织学分析。

结果：所有的狗术后都恢复了运动功能、肛门括约肌张力和感觉功能。除了一只0.15%阿米曲替林组的狗，其它所有阿米曲替林组的狗均出现了明显的粘连性蛛网膜炎，而对照组均没有出现上述症状。但是神经胶质纤维酸性蛋白质的组织学染色没有提示其对神经有直接损伤作用。

结论：椎管内给予阿米曲替林，即使是低剂量的，仍会出现明显的粘连性蛛网膜炎。尽管没有证据提示其有毒性左右，但是低浓度使用也是不安全的。

（陈珺珺译 薛张纲校）

BACKGROUND: As a result of amitriptyline's vast array of actions, it could potentially be used as an intraspinal adjuvant in neuraxial anesthesia and/or in the treatment of refractory neuropathic pain. None of the previous studies examining the safety profile of intraspinal single doses of amitriptyline found signs of toxicity at concentrations below 15.4 mM/L (0.5%) and the current hypothesis regarding the pathophysiology of amitriptyline toxicity suggests it might be safe at low concentrations while still having relevant clinical effects. Hence, we conducted this study to assess the clinical and histological toxicity of intraspinal amitriptyline at the lowest dosages previously known to be effective.

METHODS: Twenty-one dogs were randomized to receive a 1-mL single intraspinal dose of one of the three solutions: saline (0.9%), amitriptyline (0.15%), or amitriptyline (0.3%). The dogs were evaluated clinically 1 h after awakening from anesthesia and 21 days later. At 21 days, all animals were killed, and histological sections of the spinal cord and surrounding meninges were retrieved for analysis.

RESULTS: All dogs recovered motor function, anal sphincter tone and sensibility. With the exception of one dog in the 0.15% amitriptyline group, all animals in both amitriptyline groups had marked adhesive arachnoiditis, which was absent in the control group. No evidence of direct neural damage was found on histological sections stained by glial fibrillary acidic protein technique in any of the study animals.

CONCLUSION: The intraspinal administration of amitriptyline to dogs even in low concentrations is strongly associated with the development of intense meningeal adhesive arachnoiditis and is not safe even at low concentrations for which there was no previous evidence of toxicity.

抗凝酶水平较低时磺达肝素抗凝作用降低

The Reduced Anticoagulant Effect of Fondaparinux at Low Antithrombin Levels

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背景: 抗凝血酶水平低下可能会影响到肝素或肝素相关物质（例如磺达肝素）的抗凝作用。

方法: 我们将10种不同浓度磺达肝素加入含正常($n = 25$, 抗凝血酶 $95.4\% \pm 9.2\%$)或低抗凝血酶($n = 22$, 抗凝血酶 $45.5\% \pm 13.2\%$)的血浆样本, 使用Heptest凝血实验的方法比较其抗凝作用。

结果: 在抗凝血酶不足的血样中加入任何浓度磺达肝素, Heptest凝血时间均会较正常血样短, 这表明磺达肝素的抗凝作用在抗凝血酶低下时会降低。磺达肝素的抗凝作用有饱和效应, 较高浓度磺达肝素不会进一步缩短Heptest

凝血时间。提高抗凝血酶浓度会改变剂量效应曲线。当加入抗凝血酶浓缩剂时, Heptest凝血时间可延长, 一直到磺达肝素浓度为 $10 \mu\text{g/mL}$ 。

结果: 在常规预防和治疗剂量范围, 用抗凝血酶浓缩剂治疗和或增加磺达肝素剂量, 均能使抗凝作用趋于正常。高浓度磺达肝素的抗凝作用有饱和效应。抗凝血酶水平增加可以增强磺达肝素的抗凝作用。

(张莹译 马皓琳 李士通校)

BACKGROUND: Low antithrombin levels may compromise the anticoagulant effect of heparin and heparin-related compounds, such as fondaparinux.

METHODS: We compared the anticoagulant effect of 10 concentrations of fondaparinux added to plasma samples with normal range ($n = 25$, antithrombin $95.4\% \pm 9.2\%$) and low antithrombin ($n = 22$, antithrombin $45.5\% \pm 13.2\%$) levels, using the Heptest coagulation assay.

RESULTS: Heptest clotting time was shorter at any given fondaparinux concentration in the antithrombin-deficient samples, indicating less anticoagulant effect than in the group with normal antithrombin levels. At a high fondaparinux concentration, a saturation effect is observed with no further increase in Heptest clotting time. Addition of antithrombin concentrates results in a shift of the dose-response curve. When antithrombin concentrate was added, Heptest clotting time increased up to a fondaparinux concentration of $10 \mu\text{g/mL}$.

CONCLUSIONS: In the conventional prophylactic and therapeutic dose range, not only treatment with antithrombin concentrates but also an increase in fondaparinux dose normalizes the anticoagulant effect. A saturation effect is observed at high fondaparinux concentrations. Higher levels of antithrombin lead to an exaggerated effect of fondaparinux on Heptest.

比较在咪唑定与异丙酚用于儿童磁共振成像的睡眠研究

A Comparison of Dexmedetomidine with Propofol for Magnetic Resonance Imaging Sleep Studies in Children

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背景: 磁共振成像(MRI)的睡眠研究可用于指导处理保守治疗难以治疗的阻塞性睡眠呼吸暂停症(OSA)

儿童。因为有OSA的患儿对于镇静药及麻醉药的呼吸抑制作用较敏感,为这类患儿的成像研究提供麻醉是有挑战性的。研究显示右美托咪定具有模拟自然睡眠、呼吸抑制极小的药理学特性。我们假设,与异丙酚相比,右美托咪定可能对上呼吸道张力及气道易感性影响更小,对于OSA患儿在动态MRI气道成像过程中能提供更有利的条件,对扫描过程产生的干扰更少,更少需要有创性的气道干预。

方法: 在这项回顾性描述性研究中,我们对2006年7月至2008年3月期间在MRI的睡眠研究中接受右美托咪定麻醉的52位患儿及接受异丙酚麻醉的30位患儿的资料进行了回顾研究。82例受试者中有67例可获得用整夜多道睡眠记录仪测得的OSA严重程度的资料,我们单独分析这些受试者。分析的数据包括人口统计学、OSA的严重程度、合并症、血流动力学变化、人工气道的使用、额外的气道处理及MRI扫描的成功完成情况。

结果: 两组在人口统计学特征、多道睡眠记录仪反映的OSA严重程度、麻醉诱导、血流动力学的基础值方面相近。右美托咪定组中98%的患儿及异丙酚组中100%的患儿获得了可判断的MRI睡眠研究。在82个患儿中,右美托咪定组中有46个患儿(88.5%)而异丙酚组中有21个患儿(70%)没有使用人工气道而成功完成了MRI睡眠研究($P =$

0.03)。右美托咪定组中有5个患儿(12%)而异丙酚组中有9个患儿(35%)需使用人工气道来完成研究($P =$

0.06)。右美托咪定组中有1个患儿(2%)而异丙酚组中有3个患儿(10%)需要额外的气道处理(提下颌及肩抬高)来完成研究($P =$

0.14)。右美托咪定组中的患儿曾发生心率下降,而异丙酚组中的患儿曾发生动脉压下降,这些下降有统计学意义,但无临床意义。

结论: 在OSA患儿的MRI睡眠研究中,右美托咪定所诱导的麻醉深度是可接受的,该组患儿的自然气道能获得大量的可判断的研究结果。在MRI的睡眠研究中,与异丙酚组相比,右美托咪定组对人工气道支持的需求明显减少。在有严重OSA病史的患儿的MRI睡眠研究中,右美托咪定可能是优越的麻醉药,且有益于有睡眠呼吸障碍且需要麻醉的患儿或用于其他继发性成像研究的麻醉。

(裘海敏译 马培林、李士通校)

BACKGROUND: Magnetic resonance imaging (MRI) sleep studies can be used to guide management of children with obstructive sleep apnea (OSA) refractory to conservative therapy. Because children with OSA are sensitive to the respiratory-depressant effects of sedatives and anesthetics, provision of anesthesia for imaging studies in this patient population can be challenging. Dexmedetomidine has been shown to have pharmacological properties simulating natural sleep with minimal respiratory depression. We hypothesized that, compared with propofol, dexmedetomidine would have less effect on upper airway tone and airway collapsibility, provide more favorable conditions during dynamic MRI airway imaging in children with OSA, have fewer scan interruptions, and require less aggressive airway interventions.

METHODS: In this retrospective descriptive study, we reviewed the records of 52 children receiving dexmedetomidine and 30 children receiving propofol for anesthesia during MRI sleep studies between July 2006 and March 2008. Documentation of the severity of OSA by overnight polysomnography was available for 67 of the 82 subjects, who were analyzed separately. Data analyzed included demographics, severity of OSA, comorbidities, hemodynamic changes, use of artificial airways, additional airway maneuvers, and successful completion of the MRI scan.

RESULTS: Demographics, OSA severity by polysomnography, anesthetic induction, and baseline hemodynamics were comparable in both groups. An interpretable MRI sleep study was obtained for 98% of children in the dexmedetomidine group and 100% in the propofol group. Of 82 children, MRI sleep studies were successfully completed without the use of artificial airways in 46 children (88.5%) in the dexmedetomidine group versus 21 children (70%) in the propofol group ($P = 0.03$). An artificial airway was required to complete the study in five children (12%) in the dexmedetomidine group versus nine children (35%) in the propofol group ($P = 0.06$). Additional airway maneuvers (chin lift and shoulder roll) were required to complete the study in one child (2%) in the dexmedetomidine group and three children (10%) in the propofol group ($P = 0.14$). Children in the dexmedetomidine group experienced reductions in heart rate, whereas those in the propofol group experienced reductions in arterial blood pressure; these reductions were statistically, but not clinically, significant.

CONCLUSIONS: Dexmedetomidine provided an acceptable level of anesthesia for MRI sleep studies in children with OSA, producing a high yield of interpretable studies of the patient's native airway. The need for artificial airway support during the MRI sleep study was significantly less with dexmedetomidine than with propofol. Dexmedetomidine may be the preferred drug for anesthesia during MRI sleep studies in children with a history of severe OSA and may offer benefits to children with sleep-disordered breathing requiring anesthesia or anesthesia for other diagnostic imaging studies.

滴定丙泊酚镇静作用的自动响应监测仪

Automated Responsiveness Monitor to Titrate Propofol Sedation

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背景:我们过去的研究显示对自动响应监测仪 (ARM) 的响应缺失先于响应缺失引起的潜在的严重镇静副作用,而且ARM对假阳性反应不敏感。然而,对ARM的响应缺失和恢复是否发生在相似的镇静水平仍然未知。我们假设在各个受试者中对ARM的响应缺失和恢复发生在相似镇静水平,并不依赖于丙泊酚作用的滴定方案。

方法: 21名20-

45岁的健康志愿者应用效应部位靶浓度输注系统和两种不同剂量规程方案。对所有的受试者,我们都增加丙泊酚效应部位浓度(Ce)直到发生对ARM的响应缺失。随后按固定百分比(20%、30%、40%、50%、60%和70%;固定百分比规程, $n = 10$)或线性下降(0.1、0.2、和0.3 $\mu\text{g} \cdot \text{mL}^{-1} \cdot \text{min}^{-1}$, $n =$

11)降低Ce直到ARM响应恢复。随后维持丙泊酚Ce在新的目标6分钟(Ce平台),在此期间取得动脉血样用于丙泊酚测定,并进行临床镇静评估(观察者的警觉镇静评估 [OAA/S] 分)。两种方案的每个参加者以随机顺序经历了丙泊酚Ce的每种百分比或线性降低。由每种Ce平台开始和结束时的血浆浓度(Cp)检验阶段的稳态。评估对ARM的响应概率作为丙泊酚Ce的一个函数、脑电图双频指数(BIS)和OAA/S评分,然而方案类型对这些评估值的意向是用嵌套模式(NONMEM)

进行评价的。还用分级概率模式来评估丙泊酚Ce和BIS指数对ARM响应概率的联合影响($P_{BIS/Ce}$)。

结果:在Ce平台期开始和结束时测得的丙泊酚Cp基本一致。对ARM响应的丙泊酚 Ce_{50} 是1.73 (95% 可信区间 1.55–2.10) $\mu\text{g/mL}$ ，然而相应的 BIS_{50} 是75 (71.3–77)。ARM响应的OAA/S₅₀概率是12.5/20 (12–13.4)。BIS和Ce的联合效应的分级概率模式($P_{BIS/Ce}$)与数据匹配最佳，估计其中63%由BIS提供。对于单独的受试者ARM缺失和恢复发生在相似的镇静水平。

结论:在单独的受试者可重现的ARM动力学与临床和脑电图镇静终点相似，提示ARM可用作独立的仪器来指导丙泊酚单独镇静的药物效果。

(朱慧译 马皓林 李士通校)

BACKGROUND: In previous studies, we showed that failure to respond to automated responsiveness monitor (ARM) precedes potentially serious sedation-related adversities associated with loss of responsiveness, and that the ARM was not susceptible to false-positive responses. It remains unknown, however, whether loss and return of response to the ARM occur at similar sedation levels. We hypothesized that loss and return of response to the ARM occur at similar sedation levels in individual subjects, independent of the propofol effect titration scheme.

METHODS: Twenty-one healthy volunteers aged 20–45 yr underwent propofol sedation using an effect-site target-controlled infusion system and two different dosing protocol schemes. In all, we increased propofol effect-site concentration (Ce) until loss of response to the ARM occurred. Subsequently, the propofol Ce was decreased either by a fixed percentage (20%, 30%, 40%, 50%, 60%, and 70%; fixed percentage protocol, $n = 10$) or by a linear deramping (0.1, 0.2, and 0.3 $\mu\text{g} \cdot \text{mL}^{-1} \cdot \text{min}^{-1}$; deramping protocol, $n = 11$) until the ARM response returned. Consequently, the propofol Ce was maintained at the new target for a 6-min interval (Ce plateau) during which arterial samples for propofol determination were obtained, and a clinical assessment of sedation (Observer's Assessment of Alertness/Sedation [OAA/S] score) performed. Each participant in the two protocols experienced each percentage or deramping rate of Ce decrease in random order. The assumption of steady state was tested by plotting the limits of agreement between the starting and ending plasma concentration (Cp) at each Ce plateau. The probability of response to the ARM as a function of propofol Ce, Bispectral Index (BIS) of the electroencephalogram, and OAA/S score was estimated, whereas the effect of the protocol type on these estimates was evaluated using the nested model approach (NONMEM). The combined effect of propofol Ce and BIS on the probability for ARM response was also evaluated using a fractional probability model ($P_{BIS/Ce}$).

RESULTS: The measured propofol Cp at the beginning and the end of the Ce plateau was almost identical. The Ce_{50} of propofol for responding to the ARM was 1.73 (95% confidence interval: 1.55–2.10) $\mu\text{g/mL}$, whereas the corresponding BIS_{50} was 75 (71.3–77). The OAA/S₅₀ probability for ARM response was 12.5/20 (12–13.4). A fractional probability ($P_{BIS/Ce}$) model for the combined effect of BIS and Ce fitted the data best, with an estimated contribution for BIS of 63%. Loss and return of ARM response occurred at similar sedation levels in individual subjects.

CONCLUSIONS: Reproducible ARM dynamics in individual subjects compares favorably with clinical and electroencephalogram sedation end points and suggests that the ARM could be used as an independent instrumental guide of drug effect during propofol-only sedation.

氯胺酮抑制骨髓来源的树突状细胞的成熟和Th1型免疫反应的启动

Ketamine Inhibits Maturation of Bone Marrow-Derived Dendritic Cells and Priming of the Th1-Type Immune Response

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背景: 树突细胞 (DCs) 在抗原呈递细胞中起关键作用, 而且越来越多的证据表明树突细胞调节T细胞的发育并调节免疫反应的极性。有报道氯胺酮具有免疫调节特性, 能够影响免疫细胞, 包括巨噬细胞和天然杀伤细胞。然而, 氯胺酮对树突细胞的作用尚未明确。我们检验了氯胺酮对树突细胞的免疫调节作用。

方法: 我们使用来源于骨髓的粒细胞-单核细胞集落刺激因子和白介素 (IL)-4 诱导分化的骨髓来源树突细胞, 来分析共同刺激分子 (CD40、CD80和CD86) 的表达、主要组织相容性复合物II分子以及IL-12p40的分泌。我们还进一步评价了树突细胞和T细胞的混合细胞培养的免疫反应以及在整体动物的接触性超敏反应。

结果: 氯胺酮抑制树突细胞中CD40、CD80和主要组织相容性复合物II分子的表达。使用氯胺酮处理过的树突细胞分泌IL-

12p40也减少, 且胞吞作用更强。在CD4⁺T细胞和树突细胞的混合细胞培养中, 氯胺酮处理的树突细胞刺激CD4⁺T细胞增殖并从CD4⁺T细胞分泌干扰素的倾向减弱。而且, 氯胺酮处理的树突细胞损害细胞介导免疫反应的诱导。

结论: 我们的发现表明氯胺酮抑制树突细胞的功能成熟, 并干扰整体动物中树突细胞对Th1免疫的诱导。这些新发现为氯胺酮的免疫药理作用提供了新的观点。

(颜寿译, 马皓林李士通校)

BACKGROUND: Dendritic cells (DCs) play a key role as antigen-presenting cells and growing evidence suggests that DCs influence T-cell activation and regulate the polarity of the immune response. Ketamine has been reported to have immunomodulatory properties that affect immune cells, including macrophages and natural killer cells. However, the effect of ketamine on DCs has not been characterized. We examined the immunomodulation of DCs by ketamine.

METHODS: We used bone marrow-derived DCs induced by granulocyte-monocyte-colony stimulating factor and interleukin (IL)-4 from bone marrow and analyzed the expression of costimulatory molecules (CD40, CD80, and CD86), major histocompatibility complex class II molecules, and secretion of IL-12p40.

Furthermore, we evaluated the immune response in mixed cell cultures of DCs and T cells and the contact hypersensitivity response in a whole animal.

RESULTS: Ketamine suppressed the expression of CD40, CD80, and major histocompatibility complex class II molecules in DCs. DCs treated with ketamine also secreted less IL-12p40 and displayed greater endocytosis. In mixed cell cultures with CD4⁺ T cells and DCs, ketamine-treated DCs showed less propensity to stimulate the proliferation of CD4⁺ T cells and the secretion of interferon from CD4⁺ T cells. Furthermore, ketamine-treated DCs impaired the induction of a cell-mediated immune response.

CONCLUSION: Our findings suggest that ketamine inhibits the functional maturation of DCs and interferes with DC induction of Th1 immunity in the whole animal. These novel findings provide new insight into the immunopharmacological role of ketamine.

用于电视镜检查的Macintosh喉镜片减少正常气道患者导管的使用

A Macintosh Laryngoscope Blade for Videolaryngoscopy Reduces Stylet Use in Patients with Normal Airways

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背景: 尽管大部分直接喉镜气管插管并不是用带导芯的气管导管进行的, 但是仍然建议, 导芯可以与间接电视喉镜一起使用。最近, 有多份关于带导芯的气管导管和电视喉镜并发症的报告。在这项研究中, 我们对接受气管插管用于择期手术的患者比较了三种电视喉镜 (VLSs): GlideScope[®] Ranger[™] (GlideScope, Bothell, 华盛顿州)、V-MAC[™] Storz[®] BerciDCI[®] (Karl Storz, Tuttlingen, 德国) 与 McGrath[®] (McGrath系列5, Aircraft medical, 爱丁堡, 英国), 并验证是否可以用间接电视喉镜而不使用导芯完成病人的气管插管。

方法: 行择期手术进行气管插管的450名年轻的成人 (ASA分级 I-II), 随机应用上述三个设备之一进行气道管理。用于气管插管的麻醉诱导包括芬太尼、异丙酚、罗库溴铵。首先由一名不知道分组的麻醉医生使用 Cormack-

Lehane 分级系统对经典的金属 Macintosh 窥视片进行直接喉镜检查视野进行评分。在之后的经面罩正压通气吸入氧气和七氟醚 1 分钟后, 使用三个 VLSs 之一气管插管。插管时, 收集下列数据: 插管时间、插管尝试次数、有无使用额外的工具帮助完成插管及插管条件的整体满意度评分。

结果: 每一位病人的气管插管都使用 VLSs, 并没有任何一位病人需要改为经典的 Macintosh 喉镜。与传统的 Macintosh 喉镜相比, 所有这三种 VLSs 均能提供相同或更好的 Cormack-Lehane 分级评分的声门视野, 包括声门入口更大的视角。用 GlideScope 的平均插管时间为 34 ± 20 s, 而用 V-MAC Storz 为 18 ± 12 s, McGrath VLS 为 38 ± 23 s。与其他两种 VLS 相比, 用 Storz 喉镜更快地完成气管插管 ($P < 0.05$), 并需要更少的额外工具 ($P < 0.01$), 因此有更高的首次插管成功率。Storz 组的病人有 7% 必须通过应用导芯才能完成气管插管, 而其他两组中有 50% 病人使用了导芯。

结论: 虽然这三个所研究的 VLSs 表现出明显不同的结果, 但对大部分的正常气道病人可以用特定的 VLS 喉镜片而不使用导芯成功完成气管插管。与其他两种喉镜相比, Storz VLS 取代了经典的 Macintosh 喉镜的软组织轮廓, 为气管导管置入提供了空间, 并限制了使用导芯的需要。虽然 VLSs 提供了一些包括更好的声门入口和插管条件的优点, 良好的喉镜视野并不保证容易和成功的气管导管置入。我们建议应该更详细地研究 VLSs 的几何结构, 包括窥视片的设计。

(黄丽娜译 马皓林 李士通校)

BACKGROUND: Although most tracheal intubations with direct laryngoscopy are not performed with a styletted endotracheal tube, it is recommended that a stylet can be used with indirect videolaryngoscopy. Recently, there were several reports of complications associated with styletted endotracheal tubes and videolaryngoscopy. In this study, we compared three videolaryngoscopes (VLSs) in patients undergoing tracheal intubation for elective surgery: the GlideScope[®] Ranger[™] (GlideScope, Bothell, WA), the V-MAC[™] Storz[®] Berci DCI[®] (Karl Storz, Tuttlingen, Germany), and the McGrath[®] (McGrath series 5, Aircraft medical, Edinburgh, UK) and tested whether it is feasible to intubate the trachea of patients with indirect videolaryngoscopy without using a stylet.

METHODS: Four hundred fifty consecutive adults (ASA PS I–II) undergoing tracheal intubation for elective surgery were randomly allocated for airway management with one of the three devices. Anesthesia induction for tracheal intubation consisted of fentanyl-propofol-rocuronium. An independent anesthesiologist used the Cormack-Lehane grading system to score an initial direct laryngoscopic view using a classic metal Macintosh blade. After subsequent positive-pressure ventilation using a face mask and an oxygen-sevoflurane mixture for 1 min, the trachea was intubated using one of the three VLSs. During intubation, the following data were collected: intubation time, number of intubation attempts, use of extra tools to facilitate intubation, and overall satisfaction score of the intubation conditions.

RESULTS: The trachea of every patient was intubated using the VLSs, and none of the patients required conversion to the classic Macintosh laryngoscope. All three VLSs offered equal or better view of the glottis as assessed by the mean Cormack-Lehane grade, compared with the traditional Macintosh laryngoscopy, including a larger viewing angle of the glottic entrance. The average intubation time was 34 ± 20 s for the GlideScope, 18 ± 12 s for the V-MAC Storz, and 38 ± 23 s for the McGrath VLS. Intubation with the Storz was faster ($P < 0.05$) than the other two VLS tested and necessitated fewer additional tools ($P < 0.01$), resulting in a higher first-pass successful intubation rate. A stylet had to be used in 7% of the patients in the Storz group versus about 50% of the patients when the other two VLS were used.

CONCLUSIONS: The trachea of a large proportion of patients with normal airways can be intubated successfully with certain VLS blades without using a stylet, although the three studied VLSs clearly differ in outcome. The Storz VLS displaces soft tissues in the fashion of a classic Macintosh scope, affording room for tracheal tube insertion and limiting the need for stylet use compared with the other two scopes. Although VLSs offer several advantages, including better visualization of the glottic entrance and intubation conditions, a good laryngeal view does not guarantee easy or successful tracheal tube insertion. We recommend that the geometry of VLSs, including blade design, should be studied in more detail.

麻醉病人使用不同技术鼻胃管插管：一个前瞻性、随机研究

Nasogastric Tube Insertion Using Different Techniques in Anesthetized Patients: A Prospective, Randomized Study

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背景: 在麻醉状态下，常常难以正确地放置鼻胃管。我们旨在简单地改进插鼻胃管技术并提高成功率。

方法:

200个病人入组本研究。病人被随机地分为四组：对照组、导丝组、裂缝气管导管组和颈部俯屈且侧压颈部组。当鼻胃管开始插入选择的鼻孔的时间作为操作的开始点。成功地插入鼻胃管或者连续两次失败作为结束点。记录技术的成功率、插管的持续时间 and 并发症（出血、卷曲、扭转和堵塞等）的发生率。用 χ^2 、方差分析，和Student氏检验来分析资料。

结果: 相对于对照组，所有干预组的成功率明显提高。裂缝气管导管组插入鼻胃管所需的时间明显延长。鼻胃管形变和出血是最常见的并发症。

结论: 使用输尿管导丝作为导芯、裂缝气管导管作为插管器或者头部俯屈且侧压颈部能提高鼻胃管插管的成功率。头部俯屈并侧压颈部是成功率高且并发症最少的最容易的技术。

(王宏翻译, 马皓林李士通校正)

BACKGROUND: It is often difficult to correctly place nasogastric (NG) tubes under anesthesia. We hypothesized that simple modifications in technique of NG tube insertion will improve the success rate.

METHODS: Two hundred patients were enrolled into the study. The patients were randomized into four groups: control, guidewire, slit endotracheal tube, and neck flexion with lateral neck pressure. The starting point of the procedure was the time when NG tube insertion was begun through the selected nostril. The end point was the time when there was either a successful insertion of the NG tube or a failure after two attempts. The success rate of the technique, duration of insertion procedure, and the occurrence of complications (bleeding, coiling, kinking, and knotting, etc.) were noted. χ^2 , analysis of variance, and Student's *t*-test were used to analyze the data.

RESULTS: Success rates were higher in all intervention groups compared with the control group. The time necessary to insert the NG tube was significantly longer in the slit endotracheal tube group. Kinking of the NG tube and bleeding were the most common complications.

CONCLUSION: The success rate of NG tube insertion can be increased by using a ureteral guidewire as stylet, a slit endotracheal tube as an introducer, or head flexion with lateral neck pressure. Head flexion with lateral neck pressure is the easiest technique that has a high success rate and fewest complications.

低潮气量通气在猪的急性肺损伤模型中改善脑组织氧合作用

Low Tidal Volume Ventilation in a Porcine Model of Acute Lung Injury Improves Cerebral Tissue Oxygenation

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背景: 我们研究了不同潮气量对猪的急性肺损伤 (ALI) 模型的脑组织氧合作用和脑代谢的影响。我们假设在实验性诱导的ALI后小潮气量 (LT) 的机械通气能改善脑组织氧合作用和脑代谢。

方法: 通过去除肺表面活性物质来造成实验性ALI后, 我们研究2种情况下的10只母猪: 1) 6mL/kg体重的低潮气量通气和2) 12mL/kg体重的高潮气量通气。对气体交换、血流动力学、持续脑组织氧分压 ($P_{ti}O_2$)、脑微透析和全身细胞因子这些参数进行分析。在诱导ALI后2、4和8小时进行数据的记录。最重要的终点点是 $P_{ti}O_2$ 的改变。组间进行检验。P<0.05考虑为有统计学差异。

结果: 在基础水平和ALI诱导后, 两组间的 $P_{ti}O_2$ 没有差异; 然而在4小时和8小时后高潮气量组的 $P_{ti}O_2$ 显著低于低潮气量组。两组在所有时间点的 P_aO_2 和 P_aCO_2 没有显著性差异。对于脑微透析, 在2、4和8小时后在高潮气量组细胞因子的乳酸水平显著高于低潮气量组。在高潮气量组细胞因子释放导致白介素6和8水平高于低潮气量组。

结论: 在猪的ALI模型中, 与高潮气量相比, 保护性的低潮气量通气对于脑组织氧合作用和脑代谢有显著改善作用。它会阻断动脉氧合和脑组织氧合分离现象。在高潮气量组中肺的氧合和脑代谢可能受更有特异性的免疫反应所破坏。

(唐亮译 马皓林李士通校)

BACKGROUND: In study, we investigated the effects of different tidal volumes on cerebral tissue oxygenation and cerebral metabolism in a porcine model of acute lung

injury (ALI). We hypothesized that mechanical ventilation with low tidal (LT) volumes improves cerebral tissue oxygenation and metabolism after experimentally induced ALI.

METHODS: After inducing experimental ALI by surfactant depletion, we studied two conditions in 10 female pigs: 1) LT volume ventilation with 6 mL/kg body weight, and 2) high tidal (HT) volume ventilation with 12 mL/kg body weight. Variables of gas exchange, hemodynamic, continuous cerebral tissue oxygen tension ($p_{ti}O_2$), cerebral microdialysis, and systemic cytokines were analyzed. After induction of ALI, data were collected at 2, 4, and 8 h. The primary end point was the change in $p_{ti}O_2$. For group comparisons, a *t*-test was used. A value of <0.05 was considered to indicate statistical significance.

RESULTS: At baseline and after induction of ALI, no differences between groups were found in $p_{ti}O_2$; however, $p_{ti}O_2$ was significantly lower in the HT group after 4 and 8 h. Pao_2 and $Paco_2$ showed no significant differences between the groups at all timepoints. Regarding cerebral microdialysis, a significantly higher level of extracellular lactate could be demonstrated after 2, 4, and 8 h in the HT group. The release of cytokines resulted in higher values for interleukin-6 and interleukin-8 in the HT group.

CONCLUSION: Protective ventilation with LT yielded a significant improvement in cerebral tissue oxygenation and metabolism compared to HT ventilation in a porcine model of ALI. There was dissociation between arterial and cerebral tissue oxygenation. Cerebral oxygenation and metabolism might have possibly been impaired by a more distinctive inflammatory response in the HT group.

气管内吸弓对小型代谢监测仪计算的氧耗量和二氧化碳生成量值以及肺力学的准确度的影响

The Effects of Endotracheal Suctioning on the Accuracy of Oxygen Consumption and Carbon Dioxide Production Measurements and Pulmonary Mechanics Calculated by a Compact Metabolic Monitor

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背景:开放性支气管吸弓术(ETS)常用于清除机械通气病人呼吸道里的分泌物。开放性ETS能引起动态顺应性和呼出潮气量迅速降低,导致呼吸例流监测不当或不精确,因此需要延长代谢监测仪的稳定时间。我们采用小型模块的代谢监测仪(E-COVX)持续记录无严重生理改变的机械通气儿童的呼吸量和气体交换量,来研究开放性ETS对氧耗量(VO_2)和二氧化碳生成量(VCO_2)测量结果的精确度、计算出的肺力学参数、呼吸音和静息能量消耗的瞬时效应。

方法:11位接受机械通气的败血症或头部损伤儿童,在具有临床指征时给予开放性ETS。在28次ETS实例中,标准化操作前50 min及后50 min共记录了2800个肺1-min气体交换测量值。

结果:吸弓前后的肺力学和间接测热法所得的整套结果之间没有差异。气管吸弓前、吸弓后5至55 min的 VO_2 、 VCO_2 、动态气道阻力和肺动态顺应性和呼气性每分通气量保持稳定,且不同通气模式之间无差异。连续吸弓前后 VO_2 、 VCO_2 、呼吸音和静息能量消耗的平均百分比分别为-0.6%、-1%、-0.1%和-0.3%。两组中第一测量时段与第二测量时段测量值(1min测量值-25min一套相比26-50min一套)的比值没有差别。

结论:无事故的开放型ETS对良好镇静病人的肺力学和间接热测量结果没有影响。不同通气模式下，E-COVX能够尽早到吸后5 min后就可靠地记录呼吸量和代谢指数。

(江继宏译 马皓林李士通校)

BACKGROUND: Open endotracheal suctioning (ETS), which is performed regularly in mechanically ventilated patients to remove obstructive secretions, can cause an immediate decrease in dynamic compliance and expired tidal volume and result in inadequate or inaccurate sidestream respiratory monitoring, necessitating prolonged periods of stabilization of connected metabolic monitors. We investigated the immediate effect of open ETS on the accuracy of oxygen consumption (VO_2) and carbon dioxide production (VCO_2) measurements and calculated lung mechanics, respiratory quotient, and resting energy expenditure in mechanically ventilated children without severe lung pathology, when using a compact modular metabolic monitor (E-COVX) continuously recording patient spirometry and gas exchange measurements.

METHODS: Open ETS was performed when clinically indicated in 11 children mechanically ventilated for sepsis or head injury. A total of 2800 pulmonary 1-min gas exchange measurements were recorded in 28 ETS instances for 50 consecutive minutes before and 50 min after the standardized procedure.

RESULTS: Pulmonary mechanics and indirect calorimetry did not differ between pre- and postsuction sets of measurements. Pre- and postsuction VO_2 , VCO_2 , dynamic airway resistance, dynamic compliance, and expiratory minute ventilation remained stable from 5 to 55 min after tracheal suctioning and did not differ among different ventilatory modes. Average paired differences of sequential pre- and postsuction VO_2 , VCO_2 , respiratory quotient, and resting energy expenditure were -0.6% , -1% , -0.1% , and -0.3% . Ratio differences between the first and the second periods of measurements (1–25 vs 26–50 sets of 1-min measurements) did not differ in the two groups.

CONCLUSIONS: Pulmonary mechanics and indirect calorimetry measurements are not influenced after uneventful open ETS in well-sedated patients. The E-COVX is able to reliably record spirometry and metabolic indices as early as 5 min after suctioning at different ventilator modes.

剖宫产全麻过程中的术中知晓

Intraoperative Awareness During General Anesthesia for Cesarean Delivery

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术中知晓定义为对全麻过程中发生事件的自发回忆。不采用严格限制麻醉药的方案(该方案的设计是为了限制药物通过胎盘屏障),可使剖宫产术中知晓发生率降低至约0.26%。然而,由于术中知晓可能导致创伤后应激综合症,故仍是一种令人讨厌的并发症。评估麻醉深度对于麻醉实施者来说仍是一个挑战,因为临床体征往往不可靠且尚缺乏敏感且特异的监测。已推荐采用脑电双频指数监测使得BIS值 <60 可预防术中知晓。诱导药物产生遗忘作用的能力不同,且其催眠效果消退的时间受到药物再分布速度的影响。麻醉开始后,应给予挥发吸入麻醉药且靶浓度应设定为0.7MAC(最低肺泡麻醉药浓度),已证实该浓度可等效于使平均脑电双频指数 <60 。由于摄取速度快,氧化亚氮至今仍是急诊剖宫产中降低术中知晓风险的一个重要的辅助用药。在不存在胎儿窘迫的情况下,没有理由必须使吸入氧浓度高于0.33。加深麻醉深度可降低术中知晓发生率;目前并无证据显示加深麻醉会增加子宫收缩乏力或胎儿致畸率的风险。

(周雅春译 李士通 马皓林校)

Intraoperative awareness is defined as the spontaneous recall of an event occurring during general anesthesia. A move away from rigid anesthetic protocols, which were designed to limit drug transmission across the placenta, has reduced the incidence of awareness during cesarean delivery to approximately 0.26%. Nevertheless, it remains an undesirable complication with potential for the development of posttraumatic stress disorder. Assessing depth of anesthesia remains a challenge for the anesthesia provider as clinical signs are unreliable and there is no sensitive and specific monitor. Bispectral Index monitoring with the goal of scores <60 has been recommended to prevent awareness. Induction drugs vary in their ability to produce amnesia and the period of hypnotic effect is affected by the rate at which they are redistributed. After initiation of anesthesia, volatile anesthetics should be administered to a target of 0.7 minimum alveolar anesthetic concentration, which has been shown to consistently achieve mean Bispectral Index scores <60. Because of its rapid uptake, nitrous oxide remains an important adjunct to reduce the risk of awareness during emergency cesarean delivery. In the absence of fetal compromise, there is no rationale for an inspired oxygen concentration above 0.33. Deeper levels of anesthesia reduce the incidence of awareness; current evidence does not suggest an increased risk of tocolysis or fetal morbidity.

现代羟乙基淀粉在活体肝移植中的安全性——与人血白蛋白对照

The Safety of Modern Hydroxyethyl Starch in Living Donor Liver Transplantation: A Comparison with Human Albumin

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背景: 血管内容量补充疗法是肝移植围术期治疗中的一项重要问题。有关肝移植患者使用羟乙基淀粉(HES)的安全性的数据贫乏。我们以肾功能为特别的重点,评估了一种新型的HES

130/0.4在肝移植围术期治疗中的安全性。

方法: 40例行活体肝移植的患者被前瞻性、随机地分为两组。ALB组($n = 20$)的患者使用5%人血白蛋白;HES组($n = 20$)患者使用第三代HES(6% HES 130/0.4)。胶体溶液的总量限制在 $50 \text{ mL} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$

¹。容量输注时维持动脉压或中心静脉压维持在 $5 \sim 7 \text{ mmHg}$ 。如果需要额外的液体,就用平衡晶体液。麻醉和外科技术都是标准化的。在麻醉诱导后、手术结束时、术后四天抽取动脉血样本,检测血浆肌酐和胱蛋白酶抑制剂C的血浆水平。

结果: 所有40例入选患者皆完成研究。两组人口统计和术中变量均有可比性。术后容量(均值±标准差)在HES组和ALB组分别为 $6229 \pm 1140 \text{ mL}$ 和 $4636 \pm 1153 \text{ mL}$ ($P = 0.003$)。ALB组的净蓄积液体平衡 $100 \pm 900 \text{ mL}$ 明显大于HES组 $3047 \pm 2000 \text{ mL}$ ($P = 0.029$)。血浆肌酐、肌酐清除率和胱蛋白酶抑制剂C水平显示两组无显著性差异。两组各有一例患者发生急性肾衰,需要肾脏替代治疗。

结论: 作为替代人血白蛋白而使用的HES 130/0.4对肝移植术后肾功能转归是等效的。

(唐李隽译 马皓琳李士通校)

BACKGROUND: Intravascular volume replacement therapy is an important issue in the perioperative management of liver transplantation. There is paucity of data on the safety of hydroxyethyl starch (HES) in patients undergoing liver transplantation. We

evaluated the safety of a new HES 130/0.4 in the perioperative management of liver transplantation, with a special emphasis on renal function.

METHODS: Forty patients undergoing living donor liver transplantation were prospectively randomized into two groups. Patients in the ALB group ($n = 20$) received 5% human albumin. Patients in the HES group ($n = 20$) received third generation HES (6% HES 130/0.4). Total colloid administration was limited to $50 \text{ mL} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$. The volume was given to maintain pulmonary artery occlusion pressure or central venous pressure between 5 and 7 mm Hg. If additional fluids were required, balanced crystalloid solution was used. Anesthetic and surgical techniques were standardized. Serum creatinine and cystatin C plasma levels were measured from arterial blood samples after induction of anesthesia, at the end of surgery, and on the first 4 postoperative days.

RESULTS: All 40 enrolled patients completed the study. Demographic and intraoperative variables were comparable in both groups. Postoperatively, the mean \pm sd volume was $6229 \pm 1140 \text{ mL}$ and $4636 \pm 1153 \text{ mL}$ in HES and ALB groups, respectively ($P = 0.003$). There was significantly larger net cumulative fluid balance in the ALB group $1100 \pm 900 \text{ mL}$ compared with the HES group $3047 \pm 2000 \text{ mL}$, $P = 0.029$. Serum creatinine, creatinine clearance, and cystatin C plasma levels showed no significant differences between the two groups. One patient in each group developed acute renal failure requiring renal replacement therapy.

CONCLUSION: The use of HES 130/0.4 as an alternative to human albumin resulted in equivalent renal outcome after liver transplantation.

坐骨神经导管放置：用Raj路径穿刺成功

Sciatic Nerve Catheter Placement: Success with Using the Raj Approach

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背景:持续区域镇痛越来越流行,而且已经成为很多外科手术的标准治疗方法。各种各样的坐骨神经导管放置途径被提出,各有优缺点。我们的研究在于评估Raj径路——

坐骨结节和大转子间连线的简单中点,是否可以便于放置坐骨神经导管。

方法:知情同意后,入选20名患者用Raj径路行坐骨神经导管置入。一根蓝色的Tuohy针在坐骨结节和大转子间连线中点垂直于皮肤刺入。刺激坐骨神经后,一根导管通过穿刺置入,超越穿刺点上部2-

4cm并固定。然后通过导管注入30ml 1.5%盐酸甲哌卡因。局麻药注入后20分钟,用冷试验和热刺激试验评估感觉神经阻滞,用改良的Bromage评分评估运动阻滞程度。记录并发症和副作用。

结果:在所有病例中,阻滞都很容易实施而且成功。没有观察到明显的副作用和并发症。

结论:利用容易辨别的骨性标志之间的简单标志增强坐骨神经导管的简单性和定位,可以在临床实践中推荐使用。

(黄佳佳译,马皓林,李士通校)

BACKGROUND: Continuous regional analgesia has increased in popularity and is becoming standard of care for many painful surgical procedures. Various approaches of sciatic catheter insertion have been proposed, each with attributes and disadvantages. We investigated whether the Raj approach that uses a simple midpoint landmark between the ischial tuberosity and greater trochanter will facilitate sciatic catheter placement.

METHODS: After informed consent, 20 patients were recruited to receive sciatic catheter placement using the Raj approach. An insulated Tuohy needle was inserted perpendicular to skin at the midpoint of a line between the ischial tuberosity and greater trochanter. After sciatic nerve stimulation, a catheter was inserted 2–4 cm past the end of the needle and secured. The catheters were then incrementally injected with 30 mL of 1.5% mepivacaine. Twenty minutes after local anesthetic injection, sensory block was assessed using cold and pinprick tests, whereas motor block was assessed using a modified Bromage score. Complications and side effects were recorded.

RESULTS: In all instances, blocks were easy to perform and were successful. No major side effects or complications were noted.

CONCLUSION: Use of a simple landmark between easily identifiable bony structures enhances the simplicity and placement of a sciatic nerve catheter and is recommended for use in clinical practice.

膝部手术中行单侧小剂量脊髓并不影响尿潴留的发生率

Unilateral Anesthesia Does Not Affect the Incidence of Urinary Retention After Low-Dose Spinal Anesthesia for Knee Surgery

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我们对单侧小剂量脊髓是否会减少术后尿潴留发生的可能性进行了评估。40例择期行膝关节镜检查手术的病人被随机分成两组，每组20例病人，一组接受双侧，一组接受单侧脊髓，用药均为6mg浓度为0.5%的重比重布比卡因。通过超声检测（膀胱扫描）来评定尿潴留（>500mL）的发生率，随后需要暂时导尿的病人在双侧组有7例，单侧组有6例（两组间差异不显著）。我们得出结论，单侧小剂量脊髓并不能减少尿潴留发生的可能性，我们的结果也证明了术后监测膀胱容量的重要性和必要性。（姜田军译，马皓琳，李士通校）

We evaluated whether unilateral low-dose spinal anesthesia may reduce the likelihood of postoperative urinary retention. Forty patients scheduled for knee arthroscopy randomly received bilateral ($n = 20$) or unilateral ($n = 20$) spinal anesthesia with 6-mg hyperbaric bupivacaine 0.5%. The incidence of urinary retention (>500 mL) assessed with an ultrasound device (Bladderscan) and subsequent temporary catheterization was 7/20 patients in the bilateral versus 6/20 in the unilateral group (not significant). We concluded that unilateral low-dose spinal anesthesia does not further decrease the likelihood of urinary retention. Our results demonstrate the value and necessity of monitoring bladder volume postoperatively.