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四肢骨折矫形术后患者慢性手术后疼痛的发生率及其危险因素分析*

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摘要 目的:研究四肢骨折矫形术后患者慢性手术后疼痛的发生率及其危险因素。**方法:**以2014年12月-2017年10月于我院接受四肢骨折矫形术患者300例为研究对象,于术后6个月分析慢性手术后疼痛的发生率。收集所有患者年龄、性别、体重、术前疼痛程度、二次手术、麻醉方式、术后镇痛、术后引流、合并骨质疏松、骨折类型以及骨折部位等资料,并采用单因素以及多因素Logistic回归分析术后疼痛的危险因素。**结果:**术后6个月内有96名患者术后发生慢性手术后疼痛,发生率为32.00%(96/300)。单因素分析结果显示:慢性手术后疼痛患者与术前疼痛程度、是否二次手术、麻醉方式、术后有无镇痛、是否合并骨质疏松、骨折类型、骨折部位有关($P<0.05$),与患者的性别、年龄、体重、术后是否引流无关($P>0.05$)。多因素Logistic回归分析结果显示:术前重度疼痛、二次手术、麻醉方式为非全麻、术后无镇痛、合并骨质疏松、开放性骨折以及下肢骨折均是四肢骨折矫形术后发生慢性手术后疼痛的独立危险因素($P<0.05$)。**结论:**四肢骨折矫形术后患者慢性手术后疼痛的发生率较高,术前重度疼痛、二次手术、麻醉方式为非全麻、术后无镇痛、合并骨质疏松、开放性骨折以及下肢骨折均增加了慢性手术后疼痛的发生风险,临床应根据危险因素给予针对性的干预措施。

关键词:四肢骨折;慢性;手术后疼痛;危险因素;Logistic回归分析

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Analysis of Incidence and Risk Factors of Postoperative Chronic Pain after Orthopedic Surgery for Limbs Fractures*

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ABSTRACT Objective: To study the incidence and risk factors of postoperative chronic pain after orthopedic surgery for limbs fractures. **Methods:** 300 patients who were received orthopedic surgery for limbs fractures in our hospital from December 2014 to October 2017 were selected as the research subjects, and the incidence of postoperative chronic pain was analyzed at 6 months after surgery. Age, gender, weight, preoperative pain degree, secondary surgery, type of anesthesia, postoperative analgesia, postoperative drainage, complicated osteoporosis, type of fracture and fracture site of patients were collected. Univariate and multivariate Logistic regression analysis was used to analyze the risk factors of postoperative pain. **Results:** 96 patients experienced postoperative chronic pain within 6 months after surgery, and the incidence was 32.00% (96/300). The results of single factor analysis showed that patients with chronic postoperative pain were associated with preoperative pain degree, secondary surgery or not, type of anesthesia, postoperative analgesia or not, complicated osteoporosis or not, type of fracture, fracture site ($P<0.05$), it was not related to gender, age, weight and postoperative drainage ($P>0.05$). The results of multiple factor Logistic regression analysis showed that preoperative severe pain, secondary surgery, anaesthesia for non general anesthesia, no analgesia after surgery, complicated osteoporosis, open fracture and lower limb fracture were independent risk factors for postoperative chronic pain after orthopedic surgery for limbs fractures ($P<0.05$). **Conclusion:** The incidence of chronic postoperative pain is higher after orthopedic surgery for limbs fractures. Preoperative severe pain, secondary surgery and anesthesia for non general anesthesia, no analgesia after surgery, complicated osteoporosis, open fracture and lower limb fracture increase the risk of postoperative chronic pain, clinical interventions should be targeted according to risk factors.

Key words: Limb fracture; Chronic; Postoperative pain; Risk factors; Logistic regression analysis

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前言

四肢骨折是骨科最为常见的外科疾病,大部分患者均需予以外科手术治疗^[1]。然而,外科手术作为一种创伤性治疗方式,

会对患者造成一定的影响,增加不良反应发生的风险,而疼痛是四肢骨折患者术后最常见的并发症,亦是患者最重视以及最亟待解除的症状之一^[2,3]。慢性手术后疼痛主要是指因手术导致、继发于术后且持续时间 ≥ 3 个月的疼痛,临床上又称之为

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慢性疼痛综合征,对患者的术后康复以及生活质量均造成不利影响^[4,5]。有研究报道显示,慢性手术后疼痛的发生机制较为复杂,且发生率较高,已成为骨科临床研究的热点^[6,7]。且随着生物-心理-社会新医学模式的诞生,从整体医学模式的角度对慢性手术后疼痛患者的发生因素进行讨论具有重要意义。而疼痛并非单纯的神经生理过程,而是痛感觉与痛情绪的综合反应,既往研究显示,疼痛的程度不但与手术部位、镇痛剂应用与否有关,同时与患者的流行病学状况等因素也存在密切相关^[8,9]。鉴于此,本研究通过分析四肢骨折矫形术后患者慢性手术后疼痛的发生率及其危险因素,旨在为有效降低慢性手术后疼痛的发生率提供参考,从而改善患者预后。现作以下报道。

1 资料与方法

1.1 一般资料

以2014年12月-2017年10月于我院接受四肢骨折矫形术患者300例为研究对象。纳入标准:(1)所有患者均经临床检查以及影像学检查确诊为四肢骨折,且接受手术治疗;(2)美国麻醉医师学会(American Society of Anesthesiologists, ASA)分级为I-II级^[10];(3)临床病历资料完整者;(4)可清楚表达自身疼痛情况者。排除标准:(1)合并心、肝、肾等脏器功能严重障碍者;(2)存在精神疾病或交流沟通障碍者;(3)既往有慢性疼痛史者;(4)有精神类药物使用史或依赖史者;(5)妊娠期或哺乳期妇女。其中男性患者188例,女性患者112例;年龄20-59岁,平均 (44.28 ± 12.43) 岁;体重52-73kg,平均 (65.28 ± 6.77) kg;术前疼痛情况:轻中度疼痛36例,重度疼痛264例;二次手术219例;非二次手术81例;麻醉方式:全麻73例,非全麻227例;术后镇痛125例,无镇痛175例;术后引流132例,无引流168例;合并骨质疏松者270例,无骨质疏松者30例;骨折类型:闭合性骨折107例,开放性骨折193例;骨折部位:上肢骨折122例,下肢骨折178例。所有患者及其家属均签署了知情同意书,我院伦理委员会已批准此次研究。

1.2 研究方法与判定标准

由我院统一培训的调查员收集所有患者的一般临床资料、手术治疗以及术后随访资料,主要包括:年龄、性别、体重、术前疼痛程度、二次手术、麻醉方式、术后镇痛、术后引流、合并骨质疏松、骨折类型以及骨折部位等。采用数字评分法对患者疼痛程度进行评估,分值为0-10分,其中0分表示无疼痛,1-3分为轻度疼痛,4-6分为中度疼痛,7-10分为重度疼痛。

1.3 统计学方法

本研究数据均采用SPSS20.0软件进行检测分析,计量资料实施t检验,以 $(\bar{x} \pm s)$ 表示,计数资料实施 χ^2 检验,以[n(%)]表示,四肢骨折患者术后慢性手术后疼痛与各因素的关系予以多因素Logistic回归分析, $P < 0.05$ 表明两组数据对比具有统计学意义。

2 结果

2.1 术后6个月慢性手术后疼痛发生率分析

术后6个月对300例患者进行电话回访,其中有96名患者术后发生慢性手术后疼痛,发生率为32.00%。

2.2 四肢骨折矫形术后发生慢性手术后疼痛的单因素分析

单因素分析结果显示:慢性手术后疼痛患者与术前疼痛程度、是否二次手术、麻醉方式、术后有无镇痛、是否合并骨质疏松、骨折类型、骨折部位有关($P < 0.05$),与患者的性别、年龄、体重、术后是否引流无关($P > 0.05$)。见表1。

2.3 四肢骨折矫形术后发生慢性手术后疼痛的多因素 Logistic 回归分析

以术后是否发生慢性手术后疼痛为因变量,将上述有统计学差异的指标术前疼痛程度、是否二次手术、麻醉方式、术后有无镇痛、是否合并骨质疏松、骨折类型、骨折部位作为自变量纳入多因素Logistic回归分析模型,结果显示:术前重度疼痛、二次手术、麻醉方式为非全麻、术后无镇痛、合并骨质疏松、开放性骨折以及下肢骨折均是四肢骨折矫形术后发生慢性手术后疼痛的独立危险因素($P < 0.05$)。见表2。

3 讨论

疼痛不仅增加术后一系列并发症的发生风险,同时也会对患者造成潜在的危害,导致患者其他生理系统发生疼痛,进一步引发其他疾病^[11,12]。四肢骨折是临床上较为常见的疾病,随着医疗水平以及内固定手术的不断发展,该病患者预后效果有了显著的提高。然而手术可能会导致患者出现疼痛以及外形受损等多种并发症或不良后果,其中慢性手术后疼痛是四肢骨折患者术后最为严重的并发症之一,其可导致患者骨折部位软组织出现不同程度的疼痛感,且疼痛性质与类型表现具有多样性,包括牵拉样疼痛、烧灼样疼痛、针刺样疼痛以及闪电样疼痛等,部分患者甚至会出现两种以上类型的疼痛^[13-15]。另有研究报道显示,慢性手术后疼痛患者普遍存在焦虑、睡眠障碍以及脏器功能障碍等多种伴随症状,对患者生活质量造成严重影响^[16-18]。

本研究结果表明:有96名患者在术后6个月内发生慢性手术后疼痛,发生率为32.00%。这说明了四肢骨折患者术后发生慢性手术后疼痛的风险较高,应引起临床重视。究其原因,可能与四肢骨折患者在接受手术治疗后的恢复期相对较长,伤口愈合较为缓慢,术后疼痛感也较为明显有关^[19,20]。同时,本研究经单因素分析结果显示:慢性手术后疼痛患者术前重度疼痛、二次手术、非全麻、无术后镇痛、合并骨质疏松、开放性骨折、下肢骨折人数占比高于无慢性手术后疼痛的患者,这符合杨娟等人的研究报道^[21]。二次手术会导致已经愈合的组织与神经再次出现损伤,进一步促使外周敏化以及中枢敏化,从而增加了慢性手术后疼痛发生风险^[22]。非全麻方式包括椎管内麻醉与臂丛麻醉,其中椎管内麻醉可有效减少伤害性刺激于脊髓背角的上行传导,而臂丛麻醉有效降低损伤局部的炎症反应,从而抑制了初级传入神经纤维神经元兴奋性^[23]。术后予以药物镇痛可有效减轻损伤导致的外周痛觉感受器敏化^[24]。骨质疏松会对骨折固定产生不利影响,从而增加了再次骨折或错位的发生风险,因此部分患者需注入骨水泥手术,然而由于骨质疏松会导致骨水泥局限、渗漏以及分散分布于疏松骨骼骨缝中,进一步导致未填充的脆弱区域不断被压缩,从而导致断骨变形摩擦软组织,最终引发疼痛感^[25]。开放性骨折与下肢骨折患者的病情普遍较为严重,从而增加了手术治疗难度与术后慢性手术后疼痛发生的风险^[26]。另外,经多因素Logistic回归分析结果显示:术前重度疼痛、二次手术、麻醉方式为非全麻、术后无镇痛、合并

表 1 四肢骨折矫形术后发生慢性手术后疼痛的单因素分析[n(%)]

Table 1 Single factor analysis of postoperative chronic pain after orthopaedic surgery for limbs fractures[n(%)]

Factors	Postoperative chronic pain (n=96)		χ^2	P
Gender	Male	56(58.33)	5.333	0.021
	Female	40(41.67)		
Age(years)	≥ 45	45(46.88)	0.750	0.386
	<45	51(53.12)		
	≥ 65	47(48.96)	0.083	0.773
	<65	49(51.04)		
Preoperative pain degree	Mild to moderate pain	26(27.08)	15.415	0.000
	Severe pain	70(72.92)		
Secondary surgery	Yes	79(82.29)	20.167	0.000
	No	17(17.71)		
Type of anesthesia	General anesthesia	35(36.46)	11.272	0.000
	Non general anesthesia	61(63.54)		
Postoperative analgesia	Yes	41(42.71)	4.083	0.042
	No	55(57.29)		
Postoperative drainage	Yes	44(45.83)	1.333	0.248
	No	52(54.17)		
Complicated osteoporosis	Yes	77(80.21)	15.039	0.000
	No	19(19.79)		
Type of fracture	Closed	39(40.63)	6.750	0.009
	Open	57(59.38)		
Fracture site	Upper limb	20(20.83)	23.015	0.000
	Lower limb	76(79.17)		

表 2 四肢骨折矫形术后发生慢性手术后疼痛的多因素 Logistic 回归分析

Table 2 Multivariate Logistic regression analysis of postoperative chronic pain after orthopaedic surgery for limbs fractures

Variable	β	SE	Wald χ^2	OR	P	95%CI
Preoperative severe pain	0.532	0.276	7.483	2.064	0.015	1.677~3.236
Secondary surgery	0.647	0.215	6.481	1.773	0.001	1.583~2.841
Non general anesthesia	0.473	0.216	5.352	1.921	0.000	1.587~3.595
No analgesia after surgery	0.342	0.205	3.185	2.031	0.004	1.053~3.485
Complicated osteoporosis	0.685	0.402	4.385	1.588	0.000	1.185~4.023
Open fracture	0.573	0.381	4.715	2.010	0.002	1.273~3.742
Lower limb fracture	0.511	0.295	5.023	1.749	0.000	1.286~3.975

骨质疏松、开放性骨折以及下肢骨折均是四肢骨折术后发生慢性手术后疼痛的独立危险因素。这充分证明了上述因素均在慢性手术后疼痛的发生过程中起着重要作用,临床工作中可能通过对上述因素进行针对性干预,从而降低慢性手术后疼痛的发生,达到改善患者预后的目的。另有研究报道显示^[27,28],女性和年龄低于 40 岁也是四肢骨折患者术后发生慢性手术后疼痛的危险因素,这与本研究结果存在一定差异。究其原因,作者认为

可能与本研究选取的病例数较少有关,因此在今后的研究中我们应增大样本量,以获取更为准确、可靠的数据。此外,有研究报道发现^[29,30],手术时间与慢性手术后疼痛的发生存在密切相关,且随着手术时间的不断增加,慢性手术后疼痛的发生率逐渐升高,本研究尚未纳入此类研究因素,在今后的研究报道中还需改进。

综上所述,术前重度疼痛、二次手术、麻醉方式为非全麻、

术后无镇痛合并骨质疏松、开放性骨折以及下肢骨折均增加了四肢骨折患者术后发生术后慢性手术后疼痛的风险,可通过制定针对性干预措施,降低慢性手术后疼痛发生率,改善患者预后。

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骨等,在现代药理学中显示其可抗心律失常,对气短乏力、心悸、失眠等症状均具有改善效果,不仅可用于治疗快速性心律失常,且对缓慢性心律失常例如窦性心律过缓等均具有满意的效果,且药物不良反应少,安全性高。已有较多大型临床实验证实了他汀类降脂药物用于治疗心力衰竭中的优势。本次研究结果显示患者在阿托伐他汀联合参松养心胶囊治疗 3、6、12 个月后血清 TC、TG、LDL-C 下降,HDL-C 上升,且改善程度均优于常规西医治疗,表明了长期应用阿托伐他汀的有效性。

血脂异常是心血管疾病最主要的危险因素之一,通过改善血脂紊乱在预防动脉粥样硬化病变发生、发展中具有极为重要的意义。阿托伐他汀作为一种羟甲基戊二酸单酰辅酶 A (HMG-CoA)还原酶抑制剂,可通过对 HMG-CoA 还原酶产生竞争性抑制作用,改善血脂水平。近 20 年来,多项大规模临床试验的结果显示他汀类药物在冠心病的一级和二级预防中均能显著降低心血管事件的危险。本研究结果显示长期应用他汀类药物联合参松养心胶囊并未导致患者出现较多不良反应,提示该方案是安全可靠的。

综上所述,本次研究显示长期使用阿托伐他汀联合参松养心胶囊治疗老年性慢性心力衰竭的临床治疗效果显著优于常规西医治疗,对血脂控制水平控制能达到临床满意,而且安全性高。然而,本次试验患者例数有限,随访时间较短,而且患者对阿托伐他汀药物联合参松养心胶囊的依从性均会对研究结果产生一定程度影响。另一方面,对于长期应用阿托伐他汀对神经内分泌因素、免疫和炎症激活等热点研究尚需要进一步探索。

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