

行政干预对 I 类切口围术期预防性使用抗菌药物的影响

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摘要 目的:探讨行政干预对 I 类切口围术期预防性使用抗菌药物的影响。方法 2011 年 4 月~6 月对全院手术科室进行行政干预,具体做法:卫生行政部门与医院一把手、医院与手术科室主任、科室主任与科室执业医师分别签订目标责任状,医院配合全国抗菌药物临床应用专项整治活动方案进行全员培训,并对医师进行抗菌药物临床应用培训并考核合格后,授予其相应级别的抗菌药物处方权,明确各级医师使用抗菌药物的处方权限,由医务科牵头与院感染科、药剂科、质控科联合对 I 类切口手术患者预防使用抗菌药物情况进行检查,定期实施目标奖罚,责任到科室主任和临床医生。然后抽取我院 2010 年 7 月~12 月(行政干预前)和 2011 年 7 月~12 月(行政干预后)I 类切口手术病历各 210 份,参考《抗菌药物临床应用指导原则》、卫办医政发[2009]38 号通知对 420 例 I 类切口手术患者预防使用抗菌药物情况进行回顾性分析。结果 行政干预前(2010 年 7 月~12 月)I 类切口围术期预防性抗菌药物的使用率达 83.81%(176/210),术后抗菌药物使用时间在 2~7 天者占 69.52%,大于 7 天者占 6.67%,行政干预后(2011 年 7 月~12 月)210 例患者预防使用抗菌药物使用率为 30%(63/210),显著低于未使用行政干预的 I 类切口术患者($P<0.05$),围术期术后抗菌药物使用时间在 2~7 天者占 16.67%,没有 1 例患者用药超过 7 天,抗菌药物的使用时间较未使用行政干预的 I 类切口术患者显著缩短($P<0.05$)。结论 有效的行政干预可以强化临床医生合理应用抗菌药物的意识,提高合理用药的水平,明显降低 I 类切口预防性抗菌药物的使用率,缩短抗菌药物的使用疗程。

关键词 行政干预; I 类切口; 围手术期; 抗菌药物; 预防性使用

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The Effect of Administrative Intervention on Prophylactic Antibiotic Therapy during Perioperative Period for Type I Incision Operations

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ABSTRACT Objective: To investigate the effect of administrative intervention on prophylactic antibiotic therapy during perioperative period for type I incision operations. **Methods:** Departments of surgery in our hospital were given administrative intervention from April to June in 2011. The specific approach was to sign the contracts between the public health administration and hospital president, hospital and directors of surgical departments, directors of surgical departments and doctors, respectively. All the doctors were trained with national action plan for the rectifying campaign on clinical application of antibiotics. Doctors who passed the training were awarded with corresponding levels of prescription privileges for antibiotics. The application of prophylactic antibiotic therapy during perioperative period for type I incision operations were examined by the department of hospital infection, department of pharmacy, department of quality control under the leadership of medical department, and periodic goal awards were conducted. Then 210 cases from July to December 2010 (before administrative intervention) and 210 cases from July to December 2011 (after administrative intervention) were randomly selected, and the applications of prophylactic antibiotic therapy during perioperative period for type I incision operations were retrospectively analyzed according to "Guiding principles for clinical application of antibacterial" and announcement No.[2009]38 by Guardian Office of Medical Administration. **Results:** Before administrative interference, the rate of prophylactic antibiotic therapy usage during perioperative period for type I incision operations was 83.81%(176/210), and 69.52% patients received 2-7 days of antibiotic treatment postoperation and about 6.67% patients received more than 7 days of antibiotic treatment postoperation. While after administrative interference, the rate of prophylactic antibiotic therapy usage during perioperative period for type I incision operations was 30%(63/210), which was significantly lower than the patients without administrative intervention($P<0.05$). 16.67% patients received 2-7 days of antibiotic treatment postoperation and no patient received more than 7 days of antibiotic treatment postoperation. The treatment duration was

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markedly shortened than the patients without administrative intervention ($P<0.05$). **Conclusion:** Effective administrative intervention was able to improve the consciousness of doctors to prescribe antibiotics reasonably and the level of the rational prescription, significantly reduce the rate of prophylactic antibiotic therapy usage during perioperative period for type incision operations, as well as shorten the treatment course of antibiotics.

Key words: Administrative intervention; Type incision; Perioperative period; Antibiotics; Preventive use

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前言

抗菌药物的应用涉及临床各科,是临床治疗的重要方法之一,而围手术期预防性应用抗菌药物是临床抗菌药物使用的一个重要方面。围手术期合理地预防性使用抗菌药物能有效降低手术切口的感染率,减少患者痛苦,提高医疗质量,但不合理地使用抗菌药物会导致诸如机体菌群失调、细菌耐药、二次感染、医院感染等不良后果的发生并大大增加医疗费用,给患者的健康和经济均造成沉重的负担^[1,2]。2004年,我国卫生部、国家中医药管理局、总后卫生部就围手术期抗生素的使用做出了明确规定,但国内部分医院从2008年开始对甲状腺、乳腺及疝气修补术围手术期预防用抗生素的基本情况进行调查,发现其中存在严重的不合理用药现象。为了正确贯彻执行《抗菌药物临床应用指导原则》,进一步加强抗菌药物的临床规范应用与管理,卫生部相继发布了《关于进一步加强抗菌药物临床应用管理的通知》以及《关于抗菌药物临床应用管理有关问题的通知》^[3-5]。根据相关部门规定并结合实际情况,我院于2011年4月~6月对全院手术科室Ⅰ类手术切口围手术期预防性使用抗菌药物进行行政干预,取得了较好的效果,现将结果报道如下。

1 资料与方法

1.1 研究对象

从本院2010年7月~12月(行政干预前)出院患者全部病例中,按住院号尾数为奇数随机抽取Ⅰ类手术切口病例210份,其中男性125例,女性85例,年龄为2~70岁。其中疝修补术55例,甲状腺手术21例,乳腺手术33例,脊柱手术(有植入物)11例,开颅手术30例,骨折开放性复位术(有植入物)60例。排除手术前有感染者($T>38^{\circ}\text{C}$ 或白细胞 $>10.0\times 10^9/\text{L}$)及有糖尿病、心脏病、高血压等基础疾病的患者。再从本院2011年7月~12月出院患者全部病例中,按住院号尾数为奇数随机抽取Ⅰ类手术切口病例210份,其中男性115例,女性95例,年龄为3~75岁。其中疝修补术60例,甲状腺手术30例,乳腺手术30例,脊柱手术(有植入物)20例,开颅手术25例,骨折开放性复位术(有植入物)45例。排除手术前有感染者

($T>38^{\circ}\text{C}$ 或白细胞 $>10.0\times 10^9/\text{L}$)及有糖尿病、心脏病、高血压等基础疾病的患者。

1.2 行政干预措施

2011年4月~6月对全院手术科室进行行政干预,具体做法:卫生行政部门与医院一把手、医院与手术科主任、科室主任与科室执业医师分别签订目标责任书,医院配合全国抗菌药物临床应用专项整治活动方案进行全员培训,并对医师进行抗菌药物临床应用培训并考核合格后,才授予其相应级别的抗菌药物处方权,明确各级医师使用抗菌药物的处方权限,由医学科牵头与感控科、药剂科、质控科联合对Ⅰ类切口手术患者预防使用抗菌药物情况进行检查,定期实施目标奖罚,责任到科室主任和临床医生。

1.3 调查方法

根据卫生部发布《医院感染监测规范》附录H《临床抗菌药物使用调查》所列项目制作《Ⅰ类切口手术围手术期抗菌药物预防应用调查表》,基本内容包括科别、病案号、性别、年龄、入院时间、诊断、手术名称、手术持续时间、危险因素(有无植入物)、抗菌药物名称、用法、用量、用药起止时间等。医院感染专职人员与临床药师根据《抗菌药物临床应用指导原则》、卫办医政发[2009]38号通知为标准共同查阅出院病历,按设计的表格填写,对420例Ⅰ类切口手术患者预防使用抗菌药物情况进行回顾性对比分析。

1.4 统计学分析

所有数据输入统计学软件SPSS 15.0进行分析,率或构成比的比较采用卡方检验,以 $P<0.05$ 为差异有显著统计学意义。

2 结果

2.1 未给予行政干预的Ⅰ类切口手术患者抗菌药物的使用情况

2.1.1 未给予行政干预的Ⅰ类切口手术患者术前抗菌药物使用情况和术中追加情况 未给予行政干预的210例Ⅰ类切口手术患者中,18例术前0.5h~2h给予抗菌药物,44例术前2h~12h给予抗菌药物,无术中追加用药的病例,术前抗菌药物的总使用率为29.52%(表1)。

表1 未给予行政干预的Ⅰ类切口手术患者术前抗菌药物使用情况和术中追加情况

Table 1 The application of antibacterial agents without administrative intervention on type incision operations preoperation and intraoperative addition

Surgical operation	Case	Using antimicrobial 0.5h~2h		Using antimicrobial 2h~12h		Using antimicrobial in operation	
		preoperative		preoperative		additionally	
		case(n)	rate(%)	case(n)	rate(%)	case(n)	rate(%)
Hernia repair (patch)	35	0	0			0	0
Hernia repair (no patch)	20	0	0			0	0

Thyroid surgery	21	3	14.29	3	14.29	0	0
Breast surgery	33	0	0			0	0
Craniotomy	30	0	0			0	0
Spine surgery (implants)	11	5	45.45	6	54.55	0	0
Fracture reduction surgery (implants)	60	10	16.67	35	58.33	0	0
Total	210	18	8.57	44	20.95	0	0

2.1.2 未给予行政干预的Ⅰ类切口术患者术后抗菌药物的使用情况 未给予行政干预的 210 例Ⅰ类切口术患者中,6 例术后 24h 内给予抗菌药物,10 例术后 24h~48h 给予抗菌药物,14 例术后 48h~7d 给予抗菌药物,14 例术后 7d 后给药,术后抗菌药物的总使用率为 83.81%(见表 2)。

表 2 未给予行政干预的Ⅰ类切口术患者术后抗菌药物使用情况

Table 2 The application of antibacterial agents without administrative intervention on typeⅠincision operations postoperation

Surgical operation	Case	<24h		24h~48h		48h~7d		>7d	
		Case(n)	Rate(%)	Case(n)	Rate(%)	Case(n)	Rate(%)	Case(n)	Rate(%)
Hernia repair (patch)	35	0	0	2	5.71	33	94.29	0	
Hernia repair (no patch)	20	3	1.5	2	10	9	45	0	
Thyroid surgery	21	1	4.8	4	19.05	16	76.19	0	
Breast surgery	33	2	6.06	2	6.06	19	57.58	0	
Craniotomy	30	0	0	0	0	26	86.67	4	13.33
Spine surgery (implants)	11	0	0	0	0	7	63.64	4	36.36
Fracture reduction surgery (implants)	60	0	0	0	0	50	83.33	6	10
Total	210	6	2.86	10	4.76	146	69.52	14	6.67

2.1.3 未给予行政干预的Ⅰ类切口术患者术前预防性使用抗菌药物的种类及构成比 未给予行政干预的 210 例Ⅰ类切口术患者中预防性使用抗菌药物的种类和构成比如表 3 所示,110 例采用第一代头孢菌素类抗生素,16 例采用第二代头孢菌素类抗生素,10 例采用第三代头孢菌素类抗生素,20 例采用其它β-内酰胺类抗生素,14 例采用青霉素类抗生素,2 例采用硝基咪唑类抗生素,4 例采用林可酰胺类抗生素。

表 3 未给予行政干预的Ⅰ类切口术患者术前预防性使用抗菌药物的种类及构成比

Table 3 The kind and constituent ratio of antibacterial agents without administrative intervention on typeⅠincision operations preoperation

Antimicrobial agents	Drug Category	Case(n)	Constituent ratio (%)
Cephadrine	First-generation cephalosporins	60	28.57
Cefathiamidine	First-generation cephalosporins	50	23.81
Cefotiam	Second-generation cephalosporins	16	7.62
Cefoperazone	Third-generation cephalosporins	10	4.76
Aztreonam	Beta-lactams	20	9.52
Mezlocillin sulbactam	Penicillins	14	6.67
Fasigin	Nitroimidazoles	1	0.48
Lincomycin	Lincosamides	4	1.9
metronidazole	Nitroimidazoles	1	0.48

2.2 给予行政干预的Ⅰ类切口术抗菌药物的使用情况

2.2.1 给予行政干预的Ⅰ类切口术前抗菌药物使用情况和术中追加情况 给予行政干预的 210 例Ⅰ类切口术患者中,13 例术

前 0.5h~2h 给予抗菌药物,19 例术前 2h~12h 给予抗菌药物,无术中追加用药的病例,术前抗菌药物的总使用率为 15.24%,显著低于未给予行政干预的Ⅰ类切口术患者($P<0.05$)(表 4)。

表 4 给予行政干预的 I 类切口患者术前抗菌药物使用情况和术中追加情况

Table 4 The application of antibacterial agents with administrative intervention on type I incision operations preoperation and intraoperative addition

Surgical operation	Case	Using antimicrobial 0.5h ~2h		Using antimicrobial 2h~12h		Using antimicrobial in	
		preoperative		preoperative		operation additionally	
		Case(n)	Rate(%)	Case(n)	Rate(%)	Case(n)	Rate(%)
Hernia repair (patch)	30	0	0			0	0
Hernia repair (no patch)	30	0	0			0	0
Thyroid surgery	30	3	10.00	3	10.00	0	0
Breast surgery	30	0	0			0	0
Craniotomy	20	0	0			0	0
Spine surgery (implants)	25	5	20.00	6	24.00	0	0
Fracture reduction surgery (implants)	45	5	11.11	10	22.22	0	0
Total	210	13	6.19	19	9.05	0	0

2.2.2 给予行政干预的 I 类切口患者术后抗菌药物的使用情况 给予行政干预的 210 例 I 类切口患者中,10 例术后 24h 内给予抗菌药物,18 例术后 24h~48h 给予抗菌药物,35 例术后 48h~7d 给予抗菌药物,无术后 7d 后给药者,术后抗菌药物的总使用率为 30%,显著低于未给予行政干预的 I 类切口患者(P<0.05)(表 5)。

表 5 给予行政干预的 I 类切口患者术后抗菌药物的使用情况

Table 5 The application of antibacterial agents with administrative intervention on type I incision operations postoperation

Surgical operation	Case	<24h		24h~48h		48h~7d		>7d	
		Case(n)	Rate(%)	Case(n)	Rate(%)	Case(n)	Rate(%)	Case(n)	Rate(%)
Hernia repair (patch)	30	0	0	2	6.67	2	15.00	0	
Hernia repair (no patch)	30	5	16.67	2	6.67	9	30.00	0	
Thyroid surgery	30	1	3.33	2	6.67	2	15.00	0	
Breast surgery	30	4	1.33	12	40.00	2	6.67	0	
Craniotomy	20	0	0	0	0	2	10.00	0	0.00
Spine surgery (implants)	25	0	0	0	0	7	28.00	0	0.00
Fracture reduction surgery (implants)	45	0	0	0	0	11	24.44	0	0.00
Total	210	10	4.76	18	8.57	35	16.67	0	0.00

2.2.3 给予行政干预的 I 类切口术前预防使用抗菌药物种类及构成比 给予行政干预的 210 例 I 类切口患者中预防性使用抗菌药物的种类和构成比如表 6 所示,25 例采用第一代头孢菌素类抗生素,16 例采用第二代头孢菌素类抗生素,2 例采用第三代头孢菌素类抗生素,10 例采用其它β-内酰胺类抗生素,4 例采用青霉素类抗生素,2 例采用硝基咪唑类抗生素,4 例采用林可酰胺类抗生素。

表 6 给予行政干预的 I 类切口患者术前预防性使用抗菌药物的种类及构成比

Table 6 The kind and constituent ratio of antibacterial agents on type I incision operations with administrative intervention preoperation

Antimicrobial agents	Drug Category	Case(n)	Constituent ratio (%)
Cephadrine	First-generation cephalosporins	10	4.76
Cefthiamidine	First-generation cephalosporins	15	12.50
Cefotiam	Second-generation cephalosporins	16	8.00
Cefoperazone	Third-generation cephalosporins	2	1.00
Aztreonam	Beta- lactams	10	5.00
mezlocillin sulbactam	Penicillins	4	2.00
Fasigin	Nitroimidazoles	1	0.05
Lincomycin	Lincosamides	4	2.00
metronidazole	Nitroimidazoles	1	0.05

3 讨论

3.1 行政干预对 I 类切口围术期抗菌药物使用率与时机的影响

根据卫办医政发[2009]38号文件,类切口手术一般不预防使用抗菌药物,确需使用时,要严格掌握适应证、药物选择、用药起始与持续时间^[6,7]。按照《抗菌药物临床应用指导原则》有关规定,有效预防用药的时机应选择切开皮肤粘膜前30分钟~120分钟或麻醉诱导时开始用药,以保证在发生细菌污染之前血液及组织中的药物已达到有效浓度,使抗菌药物有效覆盖时间包括整个手术过程和手术结束的4小时,而手术结束患者回病房后才开始给予抗菌药物将不能有效抑制或杀灭已侵入组织的细菌^[8,10]。2011年卫生部规定类切口手术抗生素使用率不得超过30%^[9],而本研究中行政干预前210例类切口预防性抗菌药物使用率达83.81%,术前0.5小时~2小时预防用抗菌药物的比例18例,占8.57%,44例术前2小时~12小时用药,占20.95%。但是本次调查中,手术时间超过3小时的患者有3例,手术过程中没有追加抗菌药物的记录。行政干预后,预防使用抗菌药物使用率为30%,术前0.5小时~2小时预防用抗菌药物的比例13例,占6.19%,19例术前2小时~12小时用药,占9.05%,结果表明行政干预前我院存在抗菌药物使用率和用药时机存在不合理现象,但通过行政干预后,我院抗菌药物使用率明显降低,用药时机趋于合理。

3.2 行政干预对 I 类切口术患者术后用药疗程的影响

抗生素在围手术期的早期应用能够明显降低术后感染的发生率,有效防止术后感染的发生^[11,12]。研究表明,术后3h内使用抗生素不能在细菌繁殖前建立足够的药物浓度,因此几乎没有预防感染的效果^[13]。根据国家规定,择期手术后不必再用抗菌药物,手术时间较短(<2小时)的清洁手术,术前一次即可。长期的预防用药并不能降低术后伤口的感染率,而短程用药,特别是一次性用药,可减少患者的经济负担^[14]。本次调查研究结果显示,行政干预前我院术后预防性用抗菌药物时间超过7d者占6.67%,48h~7d者占69.52%,而采取行政干预后,我院术后预防性用抗菌药物时间超过7d下降至0.00%,而48h~7d者下降至16.67%,表明行政干预前类切口手术患者术后用药时间普遍过长,而行政干预可显著缩短术后用药时间。

3.3 行政干预对 I 类切口术患者术后抗菌药物品种选择的影响

抗菌药物种类的选择,应根据各个医院的经验以及既往常见的菌种类药敏情况以及药物的抗菌谱、组织渗透力、半衰期等综合分析使用。俞莹等对398例外科住院患者,共分离421株病原菌,其中前5位分别为大肠埃希菌、金黄色葡萄球菌、铜绿假单胞菌、凝固酶阴性杆菌、肺炎克雷伯菌,并具有较高的耐药率^[15]。38号文件中明确指出应严格控制氟喹诺酮类在外科围手术期的预防用药,对 β -内酰胺类抗菌药物过敏者可选用克林霉素预防葡萄球菌、链球菌感染,选用氨曲南预防革兰氏阴性杆菌感染,预防金黄色葡萄球菌感染的替代药物主要是克林霉素磷酸酯。此次调查研究中发现行政干预前有20例(9.52%)的患者选用氨曲南,而经过行政干预后,氨曲南的使用降至10例(5%),氨曲南作为头孢菌素类过敏时的替代用药,经过行政干预后药物的选择更趋于合理。

综上所述,本研究的结果表明有效的行政干预可以强化临

床医生合理应用抗菌药物的意识,提高合理用药的水平,明显降低类切口预防性抗菌药物的使用率,缩短抗菌药物的使用疗程。

参考文献(References)

- [1] 卫生部,国家中医药管理局,总后卫生部.抗菌药物临床应用指导原则[S].卫医发[2004]285号
Ministry of Health, the State Administration of Traditional Chinese Medicine, the General Logistics Department. The guiding principles of use of antibiotics in clinical[S]. [2004] NO.285
- [2] 卫生部办公厅.关于进一步加强抗菌药物临床应用管理的通知[Z].卫办医发[2008]48号
Office of the Ministry of Health. Notice of Strengthening the management of use of antibiotics in clinical[Z]. [2008] NO.48
- [3] 卫生部办公厅.关于抗菌药物临床应用管理有关问题的通知[Z].卫医发[2009]38号
Office of the Ministry of Health. Notice of the issues about the management of use of antibiotics in clinical[Z]. [2009] NO.38
- [4] 李宝珍,平宝华,关仙花.类切口手术预防使用抗菌药物的调查分析[J].中国感染控制杂志,2009,8(2):122
Li Bao-zhen, Ping Bao-hua, Guan Xian-hua. Prophylactic application of antimicrobial agents in class incisional wound operations [J]. Chinese Journal of Infection Control, 2009, 8(2): 122
- [5] 朱琰,刘琼.施行《上海市<抗菌药物临床应用指导原则>实施细则(试行)》对我院普外科手术患者预防性用药的影响[J].中国药房,2010,21(30):2806-2809
Zhu Yan, Liu Qiong. Influence of Shanghai Guiding Principles of Clinical Use of Antibiotics Implementing Rules (Trial) on Prophylactic Use of Drugs in Patients Underwent General Surgery Operation[J]. China Pharmacy, 2010, 21(30): 2806-2809
- [6] 姜玲,史天陆,孙言才,等.某"三甲"医院3种清洁手术围术期预防性应用抗菌药物调查分析[J].中国药房,2009,20(2):103
Jiang Ling, Shi Tian-lu, Sun Yan-cai. Prophylactic Use of Antibiotics During Perioperative Period in Patients Undergoing Three Types of Aseptic Operations in a 3A Grade Hospital[J]. China Pharmacy, 2009, 20(2): 103
- [7] 姜玲,史天陆,沈爱宗,等.普外科类切口手术预防用抗菌药物干预效果研究[J].中国医院药学杂志,2010,30(18):1593
Jiang Ling, Shi Tian-lu, Shen Ai-zong, et al. The research of intervention effect On Prophylactic Antibiotic For Type Incision Operations in general surgery[J]. Chinese Journal of Hospital Pharmacy, 2010, 30 (18): 1593
- [8] 史天陆,孙言才,杜德才,等.围手术期预防使用抗菌药物合理性探讨[J].中华医院感染学杂志,2009,19(12):1552
Shi Tian-lu, Sun Yan-cai, Du De-cai. Rational Use of Antibiotics and Establishment of Implementing Regulations on Three Types of Clean Operations in Perioperative Period [J]. Chinese Journal of Nosocomiology, 2009, 19(12): 1552
- [9] 卫生部.抗菌药物临床应用管理办法(征求意见稿)[S].卫医政厅便函[2011]75号
Ministry of Health. The management approach about the use of antibiotics in clinical (draft) [S] [2011]NO. 75
- [10] 王伟,陈利欣,多力昆.我院围手术期抗菌药物应用情况调查与分析[J].中国医院用药评价与分析,2010,10(1):27(下转第4162页)

- growth factor C and microvessel density in gastric carcinoma: correlation with clinicopathological factors. Our experience and review of the literature[J]. *Oncol Res*, 2009,17(9): 405-411
- [27] Suzuki S, Dobashi Y, Hatakeyama Y, et al. Clinicopathological significance of platelet-derived growth factor (PDGF)-B and vascular endothelial growth factor-A expression, PDGF receptor-beta phosphorylation, and microvessel density in gastric cancer[J]. *BMC Cancer*, 2010,10: 659
- [28] Futagami S, Tatsuguchi A, Hiratsuka T, et al. Monocyte chemoattractant protein 1 and CD40 ligation have a synergistic effect on vascular endothelial growth factor production through cyclooxygenase 2 up-regulation in gastric cancer[J]. *J Gastroenterol*, 2008,43(3):216-224
- [29] Bhattacharyya A, Chattopadhyay R, Hall EH, et al. Mechanism of hypoxia-inducible factor 1 alpha-mediated Mcl1 regulation in Helicobacter pylori-infected human gastric epithelium [J]. *Am J Physiol Gastrointest Liver Physiol*, 2010,299(5): G1177-1186
- [30] Osinsky S, Bubnovskaya L, Ganusevich I, et al. Hypoxia, tumour-associated macrophages, microvessel density, VEGF and matrix metalloproteinases in human gastric cancer: interaction and impact on survival[J]. *Clin Transl Oncol*, 2011,13(2):133-138
- [31] Nam SY, Ko Y S, Jung J, et al. A hypoxia-dependent upregulation of hypoxia-inducible factor-1 by nuclear factor-kappaB promotes gastric tumour growth and angiogenesis [J]. *Br J Cancer*, 2011,104 (1): 166-174
- [32] Aurello P, Rossi Del Monte S, D'Angelo F, et al. Vascular endothelial growth factor C and microvessel density in gastric carcinoma: correlation with clinicopathological factors. Our experience and review of the literature[J]. *Oncol Res*, 2009,17(9):405-411
- [33] Xu C, Shen J, Xie S, et al. Impact of malignant ulcer size on lymph node stages in gastric cancer with ulcerative growth [J]. *Hepatogastroenterology*, 2012,59(114):612-615
- [34] Iordache S, Saftoiu A, Ramboiu S, et al. Vascular endothelial growth factor expression and microvessel density--two useful tools for the assessment of prognosis and survival in gastric cancer patients[J]. *J Gastrointest Liver Dis*, 2010,19(2):135-139
- [35] Amagase K, Inaba A, Senta T, et al. Gastric ulcerogenic and healing impairment effects of risedronate, a nitrogen-containing bisphosphonate in rats. Comparison with alendronate and minodronate [J]. *J Physiol Pharmacol*, 2011,62(6):609-618
- [36] Lambert K and Ward J. The use of thalidomide in the management of bleeding from a gastric cancer[J]. *Palliat Med*, 2009,23(5):473-475
- [37] Zheng YB, Cao FY, Liu KJ, et al. Value of normalization window of tumor vasculature in neoadjuvant chemotherapy for patients with unresectable gastric cancer [J]. *Zhonghua Wei Chang Wai Ke Za Zhi*, 2012,15(1):55-58
- [38] Westerhoff M, Tretiakova M, Hovan L, et al. CD61, CD31, and CD34 improve diagnostic accuracy in gastric antral vascular ectasia and portal hypertensive gastropathy: An immunohistochemical and digital morphometric study.[J]. *Am J Surg Pathol*, 2010,34(4): 494-501

(上接第 4117 页)

- Wang Wei, Chen Li-xin, Duo Li-kun. Review and Analysis on the Perioperative Utilization of Antibiotics in Our Hospital[J]. *Evaluation and Analysis of Drug-Use in Hospitals of China*, 2010, 10(1): 27
- [11] 朱卜林, 李勤裕. 抗生素在胃肠道消化外科的预防性应用[J]. *中国实用外科杂志*, 1998,18(10):631
- Zhu bo-lin, Li Qin-yu. Prophylactic Use of Antibiotics in Gastrointestinal surgery[J]. *Chinese Journal of Practical Surgery*, 1998,18(10): 631
- [12] 时德. 普外科中预防用抗生素[J]. *普外临床杂志*, 1995, 10(1):4
- Shi De. Prophylactic Use of Antibiotics During Perioperative Period in general surgery[J]. *Clinics in General Surgery*, 1995, 10(1): 4
- [13] 陈易人. 围手术期的抗生素应用[J]. *临床外科杂志*, 1999,7(2),60
- Chen Yi-ren. The Utilization of Antibiotic In Perioperative Period[J]. *Journal of Clinical Surgery*, *Journal of Clinical Surgery*, 1999, 7(2): 60
- [14] 韦秀芝, 路玫. 我院甲状腺、乳腺、疝手术围手术期应用抗菌药物分析[J]. *中国医院用药评价与分析*, 2010, 10(8): 687
- Wei Xiu-zhi, Lu Mei. Analysis of Perioperative Prophylactic Use of Antibacterials in Patients Undergoing Thyroid Gland/Mammary Gland or Hernia Surgery in Our Hospital [J]. *Evaluation and Analysis of Drug-Use in Hospitals of China*, 2010, 10(8): 687
- [15] 俞莹, 陈志勇. 医院外科手术切口感染病原菌的分布及耐药性研究[J]. *中华医院感染学杂志*, 2012, 22(6): 1282-1284
- Yu Ying, Chen Zhi-yong. Hospital surgical incision infections: distribution of pathogens and detection of drug resistance [J]. *Chinese Journal of Nosocomiology*, 2012, 22(6): 1282-1284