

· 临床研究 ·

糖尿病足溃疡创面治愈后复发的影响因素分析

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【摘要】目的 探讨老年糖尿病足溃疡(DFUs)治愈后复发的相关因素。**方法** 随访观察2011年4月至2016年1月在贵州医科大学第三附属医院治疗并治愈出院的165例老年DFUs患者2年,根据是否复发,将患者分为复发组和未复发组,并对可能影响复发的相关因素进行分析。采用SPSS 19.0对数据进行统计分析。组间比较采用 χ^2 检验;多因素分析采用非条件logistic回归模型。**结果** 随访2年,患者复发率为30.91%(51/165)。单因素分析显示,糖尿病足病程(≥ 60 d)、吸烟、缺血型糖尿病足、Wagner分级(Ⅲ、Ⅳ)、多重耐药菌感染、清创不彻底、踝肱指数(< 0.9)、血糖(≥ 11.1 mmol/L)、血浆黏度(≥ 1.5 mPa·s)、血清白蛋白(< 30 g/L)、糖化血红蛋白($\geq 8\%$)与DFUs治愈后复发相关,差异均有统计学意义($P < 0.05$)。非条件logistic回归分析显示,吸烟[OR = 2.836, 95% CI 1.050 ~ 7.661; $P = 0.040$]、缺血型糖尿病足[OR = 9.796, 95% CI 2.794 ~ 34.351; $P = 0.000$]、Wagner分级(Ⅲ、Ⅳ)[OR = 4.426, 95% CI 1.665 ~ 11.760; $P = 0.003$]、多重耐药菌感染[OR = 2.756, 95% CI 1.011 ~ 7.515; $P = 0.048$]、 $\geq 8\%$ 糖化血红蛋白[OR = 6.366, 95% CI 2.362 ~ 17.157; $P = 0.000$]及 ≥ 1.5 mPa·s的血浆黏度[OR = 3.699, 95% CI 1.332 ~ 10.269; $P = 0.012$]是DFUs治愈后复发的危险因素。**结论** 对患者全身与局部进行全面分级分类评估、早期诊断、早期彻底清创引流换药、有效控制血糖、合理选用抗菌药物和抗凝治疗,以及有效纠正局部缺血等综合措施可有效降低DFUs治愈后复发的风险。

【关键词】 老年人;复发;因素分析;糖尿病足溃疡

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Influencing factors of recurrences of the healed diabetic foot ulcers

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【Abstract】Objective To investigate the influencing factors of the recurrences of the healed diabetic foot ulcers (DFUs) in the elderly. **Methods** A total of 165 elderly patients cured of DFUs from April 2011 to January 2016 were observed and followed up for 2 years after discharge from the hospital. According to whether they had recurrence, the subjects were divided into recurrence group and non-recurrence group, and the related factors that may affect recurrence were analyzed. SPSS statistics 19.0 was used to perform the statistical analysis. Chi-square test was used for comparison between groups. Non conditional logistic regression analysis was carried out for multiple factors. **Results** The recurrence rate was 30.91% (51/165). Univariate analysis showed that the recurrence of healed DFUs was associated with the disease course (≥ 60 d), smoking, type of foot disease (ischemic), Wagner classification (Ⅲ, Ⅳ), multidrug resistant infection, incomplete debridement, ankle-brachial index (< 0.9), blood glucose (≥ 11.1 mmol/L), plasma viscosity (≥ 1.5 mPa·s), serum albumin (< 30 g/L), and glycosylated hemoglobin ($\geq 8\%$). The difference was statistically significant ($P < 0.05$). Non logistic regression analysis showed that the risk factors for the recurrence of healed DFUs included smoking [OR = 2.836, 95% CI 1.050 ~ 7.661; $P = 0.040$], ischaemic diabetic foot [OR = 9.796, 95% CI 2.794 ~ 34.351; $P = 0.000$], Wagner scores (Ⅲ, Ⅳ) [OR = 4.426, 95% CI 1.665 ~ 11.760; $P = 0.003$], multidrug resistant infections [OR = 2.756, 95% CI 1.011 ~ 7.515; $P = 0.048$], $\geq 8\%$ glycosylated hemoglobin [OR = 6.366, 95% CI 2.362 ~ 17.157; $P = 0.000$], and plasma viscosity ≥ 1.5 mPa·s [OR = 3.699, 95% CI 1.332 ~ 10.269; $P = 0.012$]. **Conclusion** The recurrences of the healed DFUs could be effectively reduced by thorough evaluation, classification, and grading of the patient's condition (both general and local), early diagnosis, early debridement and drainage, effective control of blood glucose, rational use of antimicrobial agents, anticoagulant therapy, and effective correction of ischaemia.

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【Key words】 aged; recurrence; factor analysis; diabetic foot ulcer

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糖尿病足是糖尿病患者的重要并发症之一,以足部红肿、溃疡、化脓、坏疽等为主要表现,其致死率与致残率极高。在临床就诊的糖尿病足患者中以糖尿病足溃疡(diabetic foot ulcers, DFUs)为主,约占70%^[1]。DFUs的发病率与年龄密切相关,尤以老年患者更易发生^[2]。一旦发生,治疗效果较差,且疗效不稳定,易复发加重。因此,了解DFUs创面治愈后复发的影响因素对临床具有重要参考价值。本研究回顾性分析165例老年DFUs治愈患者随访2年内的复发情况,探讨其治愈后复发的相关影响因素,现报告如下。

1 对象与方法

1.1 研究对象

随访观察2011年4月至2016年1月在贵州医科大学第三附属医院治疗并治愈出院的171例老年DFUs患者,失访6例,最终纳入患者165例。其中男性87例,女性78例,年龄60~91(72.6±8.0)岁。纳入标准:年龄≥60岁且临床确诊为DFUs并治愈的出院患者。排除标准:(1)失访病例;(2)不配合随访与检查;(3)非糖尿病引起的足溃疡感染。糖尿病足分级标准按Wagner分级方法进行^[3],有2处以上创面的患者以Wagner分级较高的创面为准。

1.2 方法

收集患者临床资料并进行电话与门诊随访,3个月1次,持续2年,内容包括性别、年龄、病程、Wagner分级、血糖、糖化血红蛋白、清创情况(根据手术记录进行判断,描述清创时将坏死组织全部清除至活组织者为彻底清创,描述不清、未描述彻底清除或描述未彻底清除坏死组织者均判断为不彻底清创)、是否吸烟、多重耐药菌感染情况、糖尿病足类型、血浆黏度、血清白蛋白、血红蛋白、高血压病史、冠心病史、脑血管病史、踝肱指数、有无复发等内容。根据2年内是否复发,将患者分为复发组和未复发组。

1.3 统计学处理

采用SPSS 19.0对数据进行统计分析。计数资料以百分率表示,组间比较采用 χ^2 检验。多因素分析采用非条件logistic回归模型。 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 2组患者一般资料比较

165例患者复发51例,复发率30.91%。单因素分析显示,糖尿病足病程(≥60 d)、吸烟、缺血型糖尿病足、Wagner分级(Ⅲ、Ⅳ)、多重耐药菌感染、清创不彻底、踝肱指数(<0.9)、血糖(≥11.1 mmol/L)、血浆黏度(≥1.5 mPa·s)、血清白蛋白(<30 g/L)、糖化血红蛋白(≥8%)与DFUs治愈后复发相关,差异有统计学意义($P < 0.05$;表1)。

2.2 DFUs治愈后复发的多因素分析

将有统计学差异的因素纳入logistic多因素回归模型分析显示,吸烟、缺血型糖尿病足、Wagner分级(Ⅲ、Ⅳ)、多重耐药菌感染、糖化血红蛋白(≥8%)、血浆黏度(≥1.5 mPa·s)是DFUs治愈后复发的独立危险因素(表2)。

3 讨论

DFUs临床治疗效果不佳,疗效不稳定,复发率高,是临床难题之一^[4]。Waaajman等^[5]对171例糖尿病足患者随访18个月,结果71例复发,复发率为41.52%,本研究165例DFUs治愈患者经随访2年,复发率30.91%(51/165),与上述研究结果相近。

本研究单因素分析显示,糖尿病足病程(≥60 d)、吸烟、缺血型糖尿病足、Wagner分级(Ⅲ、Ⅳ)、多重耐药菌感染、清创不彻底、踝肱指数(<0.9)、血糖(≥11.1 mmol/L)、血浆黏度(≥1.5 mPa·s)、血清白蛋白(<30 g/L)、糖化血红蛋白(≥8%)与DFUs治愈后复发相关($P < 0.05$)。分析如下。DFUs病程超过60 d会使DFUs复发率增加,这与付晗等^[6]研究结果相似,可能与病原菌生物膜形成有关。清创过程中炎症坏死组织清除不彻底,引流不充分,炎症坏死组织在局部大量繁殖,使得局部感染难以控制,这不仅令创面难以愈合,即使创面愈合,局部仍有炎症组织残留,易于复发。Wagner分级高,特别是WagnerⅢ级及以上患者足部感染深达骨组织,如此不仅治疗效果明显较差,而且病原菌潜伏在骨组织中以形成生物膜,当机体免疫功能下降时就很容易复发,这与李延忠等研究结果相似^[7]。多重耐药菌对抗菌药物敏感性低,大量具有多重耐药性病原

表1 2组DFUs患者治愈后复发单因素分析

Table 1 Univariate analysis of recurrence after cure of DFUs [n(%)]

Item	Non-recurrent group (n = 114)	Recurrent group (n = 51)	P value
Age ≥70 years	64 (56.14)	32 (62.75)	0.427
Male	59 (51.74)	28 (54.90)	0.708
Course of foot disease ≥60 d	64 (56.14)	38 (74.51)	0.025
Smoking	29 (25.44)	22 (43.14)	0.023
History of hypertension	31 (27.19)	17 (33.33)	0.422
History of CHD	38 (33.33)	21 (41.18)	0.331
History of cerebrovascular disease	20 (17.54)	15 (29.41)	0.085
ABI <0.9	71 (62.28)	41 (80.39)	0.021
Type of diabetic foot disease			0.001
Ischemic	71 (62.28)	45 (88.24)	
Non deficient blood	43 (37.72)	6 (11.76)	
Wagner classification			0.000
III and IV	31 (27.19)	31 (60.78)	
I and II	83 (72.81)	20 (39.22)	
Incomplete debridement	27 (23.68)	27 (52.94)	0.000
Multidrug-resistant bacteria infection	21 (18.42)	20 (39.22)	0.004
Blood glucose ≥11.1 mmol/L	41 (35.96)	28 (54.90)	0.023
Glycosylated hemoglobin ≥8%	21 (18.42)	23 (45.10)	0.000
Plasma viscosity ≥1.5 mPa·s	46 (40.35)	31 (60.78)	0.015
Serum albumin <30 g/L	31 (27.19)	22 (43.14)	0.043
Hemoglobin <90 g/L	13 (11.40)	9 (17.65)	0.082

DFUs; diabetic foot ulcers; CHD; coronary heart disease; ABI; ankle-brachial index

表2 DFUs治愈后复发的logistic危险因素分析

Table 2 Logistic regression analysis of recurrence risk factors after cure of DFUs

Factor	β	SB	Wald	P value	OR(95% CI)
Smoking	1.042	0.507	4.225	0.040	2.836 (1.050 - 7.661)
Type of foot disease (blood deficiency type)	2.282	0.640	12.708	0.000	9.796 (2.794 - 34.351)
Wagner classification (III, IV)	1.487	0.499	8.897	0.003	4.426 (1.665 - 11.760)
Multidrug-resistant bacteria infection	1.014	0.512	3.925	0.048	2.756 (1.011 - 7.515)
Glycosylated hemoglobin ≥8%	1.851	0.506	13.388	0.000	6.366 (2.362 - 17.157)
Plasma viscosity ≥1.5 mPa·s	1.308	0.521	6.304	0.012	3.699 (1.332 - 10.269)

DFUs; diabetic foot ulcers

菌得以存活,感染难以控制,加上DFUs感染病程一般较长,反复使用抗菌药物,又可诱导产生新的多重耐药菌感染^[8],因此临床治疗DFUs更应注意制定合理抗菌药物方案。血流量降低是DFUs复发的重要原因,而踝肱指数是反映血管状态的重要指标。踝肱指数小,提示下肢缺血严重^[9]。本研究显示,缺血型DFUs治愈后复发率较高,这可能与下肢血供较差相关。长期血糖浓度升高可抑制细胞增长,促进血管内皮凋亡,诱发动脉硬化,因此DFUs易于复发^[10]。糖化血红蛋白为红细胞中血红蛋白与血清中糖类相结合的产物,其含量取决于血糖浓度以及血糖与血红蛋白接触时间,不受抽血时间、是否空腹与使用胰岛素等因素影响,与血糖测定相比影响因素少,更能反映血糖长期控制情况,因此糖化血红蛋白升高时,提示DFUs患者治愈后复发的可能性

更大。有研究表明,血浆黏度过高则血流受阻,缺血加重^[11],因此亦有可能增加DFUs治愈后的复发率。患者营养状态欠佳,白蛋白<30 g/L时自身修复能力下降,加之血液供应不足与神经营养缺乏,局部溃疡便更易复发^[12]。吸烟可引起周围血管收缩,血流受阻,局部缺血,亦影响DFUs创面治愈复发^[13,14]。影响DFUs复发的因素较多,为控制混杂因素的影响,找出具有独立作用的危险因素,本研究将单因素分析具有统计学差异的因素纳入logistic回归模型进行多因素分析,结果提示吸烟、缺血型糖尿病足、Wagner分级(III、IV)、多重耐药菌感染、糖化血红蛋白(≥8%)、血浆黏度(≥1.5 mPa·s)是DFUs治愈后复发的独立危险因素,临床应给予重点关注。

综上所述,造成DFUs创面治愈后复发的因素较多,既有全身因素,亦有局部因素,既有内科治疗

因素,亦有外科治疗因素,临床应首先对患者全身与局部进行全面分级分类评估,早期诊断,早期彻底清创引流换药,有效控制血糖,合理选用抗菌药物及抗凝治疗,有效纠正局部缺血等,如此才可能有效降低DFUs治愈后复发的风险。

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