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太原市杏花岭区白癜风患者临床流行病学调查及患病影响因素的 Logistic 回归分析*

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摘要 目的:调查太原市杏花岭区白癜风患者临床流行病学情况,并分析患病影响因素。**方法:**于2020年6月至2021年6月采用多阶段分层随机抽样的方法,抽取太原市杏花岭区辖10个街道符合条件的常住居民进行调查,共抽取1440例,实际完成调查研究1428例,应答率为99.17%。采用我院自行设计的问卷调查表收集资料。根据是否患有白癜风将研究对象分为白癜风组($n=31$)和无白癜风组($n=1397$)。采用单因素和多因素 Logistic 回归分析太原市杏花岭区白癜风患者患病影响因素。**结果:**纳入的1428例居民中,共诊断出31例患有白癜风,患病率为2.17%。31例白癜风患者中,男性占比高于女性,占54.84%;年龄21~40岁区间患病率最高,占29.04%;未婚的白癜风患者偏多,占45.17%;文化程度为初中的白癜风患者发生率偏高,占41.94%;职业为学生的白癜风患者发生率偏高,占32.27%。单因素分析显示:太原市杏花岭区白癜风的患病与白癜风家族史、精神因素、暴晒史、饮酒史、吸烟史、经常接触化学物质、饮食规律、蔬果摄入量、饮食合理、皮肤病史有关($P<0.05$)。多因素 Logistic 回归分析显示:饮酒史、白癜风家族史、皮肤病史、经常接触化学物质、暴晒史、精神因素是白癜风发病的潜在独立危险因素,而饮食合理、蔬果摄入量、饮食规律则是其保护因素($P<0.05$)。**结论:**太原市杏花岭区白癜风发生率较高,饮酒史、白癜风家族史、皮肤病史、经常接触化学物质、暴晒史、精神因素是白癜风发病的潜在独立危险因素,而饮食合理、蔬果摄入量、饮食规律则是其保护因素。

关键词:太原市;杏花岭区;白癜风;流行病学;影响因素

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Clinical Epidemiological Investigation of Vitiligo Patients in Xinghualing District of Taiyuan City and Logistic Regression Analysis of the Influential Factors*

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ABSTRACT Objective: To investigate the clinical epidemiology of vitiligo patients in Xinghualing District of Taiyuan City, and to analyze the influencing factors. **Methods:** From June 2020 to June 2021, 1440 eligible permanent residents from 10 streets under the jurisdiction of Xinghualing District, Taiyuan City were selected by multi-stage stratified random sampling method, 1428 of which were actually investigated, with a response rate of 99.17%. The questionnaire designed by our hospital was used to inquire and record the epidemiological information and clinical characteristics of all the respondents in detail. The subjects were divided into vitiligo group ($n=31$) and non-vitiligo group ($n=1397$) according to whether they had vitiligo. The influencing factors of vitiligo patients in Xinghualing District of Taiyuan City were analyzed by univariate and multivariate Logistic regression analysis. **Results:** Among 1428 residents included, 31 patients were diagnosed with vitiligo, with a prevalence rate of 2.17%. Among the 31 vitiligo patients, the proportion of male was higher than that of female, accounting for 54.84%. The prevalence was highest in the age range of 21~40 years, accounting for 29.04%. Unmarried vitiligo patients tend to be more, accounted for 45.17%. The incidence of vitiligo was higher in middle and high school students with education level, accounting for 41.94%. The incidence of vitiligo in students was high, accounting for 32.27%. Univariate analysis showed that the occurrence of vitiligo in Xinghualing District of Taiyuan City was associated with family history of vitiligo, mental factors, history of sun exposure, drinking history, smoking history, frequent exposure to chemical substances, dietary rules, intake of fruits and vegetables, reasonable diet, and skin history ($P<0.05$). Multivariate Logistic regression analysis showed that drinking history, family history of vitiligo, history of skin diseases, frequent exposure to chemicals, history of exposure to sun, and mental factors were the potential independent risk factors for vitiligo, while reasonable diet, large intake of vegetables and fruits, and regular diet were the protective factors ($P<0.05$). **Conclusion:** The incidence of vitiligo is high in Xinghualing District, Taiyuan City. The history of

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alcohol consumption, family history of vitiligo, history of skin diseases, frequent exposure to chemicals, history of sun exposure, and mental factors are the potential independent risk factors for vitiligo, while reasonable diet, large intake of vegetables and fruits, and dietary laws are the protective factors.

Key words: Taiyuan; Xinghualing District; Vitiligo; Epidemiology; Influencing factors

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前言

白癜风是临床常见的后天性色素脱失性皮肤病,主要是由于功能性表皮黑素细胞缺失和(或)功能异常导致出现皮肤白斑^[1,2]。白癜风可发表于体表的任何部位,可造成患者的容貌损毁,不仅给患者带来经济压力,还会严重影响患者的社交活动和心理健康^[3]。白癜风的治疗方法较多,但由于白癜风病因极其复杂,使得治疗较为困难^[4]。加上白癜风致病因素相互作用,使得白癜风的病程延长,病情反复^[5]。因此,深入了解白癜风的流行病学特征,并分析其影响因素是临床的研究热点之一。杏花岭区是山西省太原市6个市辖区之一,位于太原市东北部,总面积170.2平方千米,常住人口为77.94万人,属温带季风性气候^[6]。现临床有关该地区的白癜风流行病学尚无报道,本文就此展开流行病学调查,并分析该地区白癜风患病的影响因素,以期对白癜风防治提供科学的参考依据。

1 资料与方法

1.1 临床资料

于2020年6月至2021年6月采用多阶段分层随机抽样的方法,抽取太原市杏花岭区辖10个街道中符合条件的常住居民进行调查。抽样分为4个阶段:第1阶段为系统抽样,抽取3街道;第2阶段为单纯随机抽样,在第1阶段中抽取的3街道上每个街道随机抽取2个社区、2个行政村;第3阶段为单纯随机抽样,在第2阶段抽出的6个社区、6个行政村各随机抽出120个家庭户;第4阶段为单纯随机抽样,在第3阶段各抽出的120个家庭户中随机抽出1个家庭成员,进行家庭问卷调查。共抽取1440例,完成调查研究的有1428例,应答率为99.17%。纳入标准:长期(居住时间1年以上)居住在调查选定的居民区。排除标准:因某些特殊情况不能配合调查的人员。

1.2 资料收集

采用我院自行设计的问卷调查表,内容包括:(1)一般人口学资料:婚姻状况(离异、未婚、已婚、丧偶)、性别、年龄、文化程度(小学及以下、初高中、大专及以上)、职业(农林牧渔劳动者、行政技术人员、退休/下岗、学生、其他)、白癜风家族史、过敏性疾病、精神因素(紧张、焦虑、抑郁、正常)、皮肤病史;(2)行为资料:暴晒史、饮酒史、吸烟史、经常接触化学物质、睡眠状况;(3)饮食资料:饮食规律、蔬果摄入量(少、一般、大)、饮食合理。

1.3 白癜风诊断标准

参考《中国临床皮肤病学》^[7],经Wood灯检查、皮肤影像学检查、组织病理学、实验室检查等确诊。

1.4 质量控制

研究开始前所有调查员接受培训,熟悉所进行的研究过程,熟悉调查表的意义及内容,对调查语言均统一培训。符合以

下内容则认定为无效问卷调查:(1)被调查者回忆偏差严重者;(2)问卷回答不符合实际情况者;(3)问卷填写缺失率超过10%(不包括10%)。

1.5 统计学方法

选用SPSS27.0统计学软件,计数资料以例(%)表示,行Fisher精确概率法检验或 χ^2 检验;多因素Logistic回归分析太原市杏花岭区白癜风患病的影响因素; $P<0.05$ 为差异有统计学意义。

2 结果

2.1 太原市杏花岭区居民的白癜风流行病学调查

纳入的1428例居民中,男性810例,女性618例,共诊断出31例患有白癜风,发生率为2.17%。31例白癜风患者中,男性占比高于女性,占54.84%;年龄21~40岁区间患病率最高,占29.04%;婚姻状况方面,未婚的白癜风患者偏多;占45.17%;文化程度为初高中的白癜风发生率偏高,占41.94%;职业为学生的白癜风发生率偏高,占32.27%。见表1。

2.2 太原市杏花岭区白癜风患病的单因素分析

根据是否患有白癜风将研究对象分为白癜风组($n=31$)和无白癜风组($n=1397$)。太原市杏花岭区白癜风的患病与年龄、性别、婚姻状况、文化程度、职业、过敏性疾病、睡眠状况无关($P>0.05$),而与白癜风家族史、精神因素、暴晒史、饮酒史、吸烟史、经常接触化学物质、饮食规律、蔬果摄入量、饮食合理、皮肤病史有关($P<0.05$)。见表2。

2.3 太原市杏花岭区白癜风患病的多因素分析

以表2中有统计学差异的因素为自变量,以纳入调查的太原市杏花岭区居民是否发生白癜风为因变量,多因素Logistic回归分析显示:饮酒史、白癜风家族史、皮肤病史、经常接触化学物质、暴晒史、精神因素是白癜风发病的潜在独立危险因素,而饮食合理、蔬果摄入量、饮食规律则是其保护因素($P<0.05$)。见表3、表4。

3 讨论

白癜风作为一种损容性疾病,以皮损中黑素细胞进行性丢失为主要特点^[8]。迄今为止,其发病机制不明确,多认为是神经源性、遗传和免疫因素相互作用的结果,此外,多种因素也可以诱导其发病,常通过触发机体的氧化应激反应,促使多种机制共同作用诱发白癜风^[9,10]。目前诸多学者致力于从白癜风流行病学和影响因素的角度探索其防治方案^[11,12]。本文就此展开探讨。

在我国不同地区,白癜风的发病率约0.1%~2%不等,且呈上升趋势^[12,13]。而在本次研究纳入的1428例居民中,共诊断出31例患有白癜风,发生率为2.17%,尚处于正常发病率范围。但略高于裴广德等^[13]学者调查的河南省焦作地区白癜风患病率

表 1 太原市杏花岭区居民的白癜风流行病学调查

Table 1 Epidemiological investigation of vitiligo in residents of Xinghualing District of Taiyuan City

Items		Cases(n=31)	Percentage
Gender	Male	17	54.84%
	Female	14	45.16%
Age(years)	≤ 10	3	9.68%
	11~20	6	19.35%
	21~40	9	29.04%
	41~59	7	22.58%
	≥ 60	6	19.35%
Marital status	Married	11	35.48%
	Unmarried	14	45.17%
	Divorce	4	12.90%
	Widow	2	6.45%
Education level	Primary school and below	9	29.03%
	Middle and high school	13	41.94%
	Junior college or above	9	29.03%
Occupation	Farming, forestry, animal husbandry and fishing workers	6	19.35%
	Administrative technicians	9	29.03%
	Retirement/laid-off	6	19.35%
	Student	10	32.27%
	Other	0	0.00%

表 2 太原市杏花岭区白癜风患病的单因素分析(n,%)

Table 2 Univariate analysis of vitiligo in Xinghualing district of Taiyuan City(n, %)

Factors		Vitiligo group(n=31)	Non-vitiligo group(n=1397)	$\chi^2/-$	P
Age(years)	≤ 10	3(9.68)	126(9.02)	0.132	0.998
	11~20	6(19.36)	273(19.54)		
	21~40	9(29.03)	384(27.49)		
	41~59	7(22.58)	352(25.20)		
	≥ 60	6(19.35)	262(18.75)		
Gender	Male	17(54.84)	793(56.76)	0.052	0.831
	Female	14(45.16)	604(43.24)		
Marital status	Married	11(35.48)	496(35.50)	3.289	0.351
	Unmarried	14(45.16)	438(31.35)		
	Divorce	4(12.91)	380(27.20)		
	Widow	2(6.45)	83(5.95)		
Education level	Primary school and below	9(29.03)	402(28.78)	0.028	0.990
	Middle and high school	13(41.94)	573(41.01)		
	Junior college or above	9(29.03)	422(30.21)		
Occupation	Farming, forestry, animal husbandry and fishing workers	6(19.36)	309(22.12)	0.599	0.963
	Administrative technicians	9(29.03)	351(25.13)		

续表 2 太原市杏花岭区白癜风患病的单因素分析(n,%)
Table 2 Univariate analysis of vitiligo in Xinghualing district of Taiyuan City(n, %)

Factors	Vitiligo group(n=31)	Non-vitiligo group(n=1397)	$\chi^2/-$	P
Retirement/laid-off	6(19.35)	271(19.40)		
Student	10(32.26)	452(32.35)		
Other	0(0.00)	14(1.00)		
Family history of vitiligo	Yes	471(33.72)	10.238	0.001
	No	926(66.28)		
Allergic disease*	Yes	19(1.36)	-	0.382
	No	1378(98.64)		
Mental factors	Nervous	197(14.10)	16.045	0.000
	Anxious	218(15.60)		
	Depressed	220(15.75)		
	Normal	762(54.55)		
History of sun exposure	Yes	557(39.87)	4.992	0.025
	No	840(60.13)		
Drinking history	Yes	487(34.86)	5.300	0.021
	No	910(65.14)		
Smoking history	Yes	431(30.85)	6.089	0.014
	No	966(69.15)		
Frequent exposure to chemical substances	Yes	291(20.83)	20.738	0.000
	No	1106(79.17)		
Sleep status	Bad	432(30.92)	0.039	0.837
	Good	965(69.08)		
Dietary rules	Regular	926(66.28)	7.985	0.005
	Irregular	471(33.72)		
Intake of fruits and vegetables	Less	169(12.10)	56.243	0.000
	General	328(23.48)		
	Large	900(64.42)		
Reasonable diet	Reasonable	739(52.90)	6.926	0.009
	Unreasonable	658(47.10)		
Skin history	Yes	581(41.59)	6.548	0.011
	No	816(58.41)		

Note: * indicated that the data was tested by Fisher's exact probability method.

0.94%。考虑可能与每个地区的生活习惯差异、气候差异以及纳入研究的诊断方法不一致有关。

本次研究结果显示,饮酒史、白癜风家族史、皮肤病史、经常接触化学物质、暴晒史、精神因素是白癜风发病的潜在独立危险因素,而饮食合理、蔬果摄入量、饮食规律则是其保护因素。逐一分析其原因,相关研究表明^[14,15],白癜风是一种自身免疫性疾病,机体免疫系统功能异常可导致白癜风的发生。存在

皮肤病史的群体其体内细胞因子的表达变化促进了免疫反应的进展,导致免疫功能异常,进而诱发白癜风^[16]。而有白癜风家族史的患者白癜风患病风险高可能与其遗传机制相关,提示存在白癜风家族史的人群日常注意规避相关影响因素,尽可能的减少白癜风的发生风险^[17,18]。精神因素诸如紧张、焦虑、抑郁等负面情绪会导致患者免疫功能低下,负面情绪一定程度上可能会导致使得病情加重、病程延长^[19,20]。而白癜风久治不愈又会导

表 3 赋值情况
Table 3 Assignment situation

Factors	Assignment situation
Vitiligo	Not occurred=0, occurred=1
Family history of vitiligo	No=0, yes=1
Mental factors	Normal=0, depressed=1, anxious=2, nervous=3
History of sun exposure	No=0, yes=1
Drinking history	No=0, yes=1
Smoking history	No=0, yes=1
Frequent exposure to chemical substances	No=0, yes=1
Dietary rules	Regular=0, irregular=1
Intake of fruits and vegetables	Large=0, general=1, less=2
Reasonable diet	Reasonable=0, unreasonable=1
Skin history	No=0, yes=1

表 4 太原市杏花岭区白癜风患病的多因素分析
Table 4 Multivariate analysis of vitiligo in Xinghualing District of Taiyuan City

Variable	β	SE	Wald χ^2	P	OR	95% CI
Skin history	0.684	0.239	8.191	0.000	1.559	1.329~1.748
Family history of vitiligo	0.593	0.224	7.008	0.001	1.462	1.361~1.529
Mental factors	0.605	0.231	6.859	0.003	1.491	1.330~1.628
History of sun exposure	0.573	0.184	9.698	0.000	1.432	1.297~1.581
Drinking history	0.521	0.173	9.069	0.000	1.336	1.165~1.487
Frequent exposure to chemical substances	0.637	0.203	9.847	0.000	1.438	1.365~1.608
Dietary rules	-0.562	0.217	6.707	0.005	0.726	0.508~0.914
Large intake of fruits and vegetables	-0.613	0.228	7.229	0.000	0.691	0.527~0.838
Reasonable diet	-0.497	0.193	6.631	0.006	0.583	0.462~0.715

致患者负性情绪加重,形成恶性循环。因此,针对白癜风患者应及时进行心理疏导,使其树立信心,保持良好的精神状态和情绪,以降低白癜风的患病几率。适当的光照能提高人体性腺素、肾上腺素等激素分泌水平,杀除皮肤表面的细菌,促进血液循环,提高免疫力等^[21]。但暴晒会使紫外线直接作用于皮肤细胞,导致细胞结构受到破坏,细胞因子分泌异常,从而导致皮肤炎症或色素脱失,诱发白癜风^[22]。存在饮酒史的患者白癜风发生风险更高可能是因为饮酒过量会使血液回流受阻,细胞组织缺血缺氧,黑色素细胞受损,导致白癜风患病风险升高^[23]。经常接触化学物质会促使机体产生抗黑色素细胞抗体,导致黑色素细胞的死亡和脱失,同时还会扰乱机体的免疫功能,影响内分泌,促使白癜风患病风险增加^[24]。而蔬果摄入量、饮食规律、饮食合理是白癜风患病的保护因素。以往就有研究发现^[25,26],微量元素的缺乏或比例失调都可能导致黑色素细胞合成障碍。而蔬果摄入量、饮食规律、饮食合理能保证人体微量元素的均衡,适量的微量元素摄入能直接参与黑色素细胞的合成,降低白癜风的患病风险^[27]。提示白癜风患者在生活中要注意饮食结构合理,以保证人体在合成黑色素时所必需的元素和物质。综合上述结论可

知,白癜风患病的影响因素主要受到环境和遗传因素有关^[28-30]。因此,白癜风的预防与治疗要做到“调”“护”“忌”,即:调摄精神、调理饮食;保护皮肤,免受损伤;忌口、忌酒。

综上所述,太原市杏花岭区白癜风患病率较高,饮酒史、白癜风家族史、皮肤病史、经常接触化学物质、暴晒史、精神因素是白癜风发病的潜在独立危险因素,而其保护因素则是饮食合理、蔬果摄入量、饮食规律。

参考文献(References)

- [1] Bergqvist C, Ezzedine K. Vitiligo: A Review [J]. *Dermatology*, 2020, 236(6): 571-592
- [2] Speeckaert R, van Geel N. Vitiligo: An Update on Pathophysiology and Treatment Options[J]. *Am J Clin Dermatol*, 2017, 18(6): 733-744
- [3] Ezzedine K, Eleftheriadou V, Jones H, et al. Psychosocial Effects of Vitiligo: A Systematic Literature Review [J]. *Am J Clin Dermatol*, 2021, 22(6): 757-774
- [4] Nahhas AF, Braunberger TL, Hamzavi IH. Update on the Management of Vitiligo[J]. *Skin Therapy Lett*, 2019, 24(3): 1-6
- [5] Wang Y, Li S, Li C. Clinical Features, Immunopathogenesis, and Therapeutic Strategies in Vitiligo [J]. *Clin Rev Allergy Immunol*,

- 2021, 61(3): 299-323
- [6] 李玉轩. 太原杏花岭区文化旅游开发的空间格局与行动战略研究[J]. 生产力研究, 2012, 13(9): 117-119
- [7] 赵辨. 中国临床皮肤病学 [M]. 南京: 江苏科学技术出版社, 2010: 672
- [8] LeWitt TM, Kundu RV. Vitiligo [J]. JAMA Dermatol, 2021, 157(9): 1136
- [9] Bergqvist C, Ezzedine K. Vitiligo: A focus on pathogenesis and its therapeutic implications[J]. J Dermatol, 2021, 48(3): 252-270
- [10] Marchioro HZ, Silva de Castro CC, Fava VM, et al. Update on the pathogenesis of vitiligo[J]. An Bras Dermatol, 2022, 97(4): 478-490
- [11] Boniface K, Seneschal J, Picardo M, et al. Vitiligo: Focus on Clinical Aspects, Immunopathogenesis, and Therapy [J]. Clin Rev Allergy Immunol, 2018, 54(1): 52-67
- [12] 王晓艳, 王婷琳, 周城, 等. 中国六省市白癜风流行病学调查[J]. 中华皮肤科杂志, 2010, 43(7): 463-466
- [13] 裴广德, 杜金锋, 黄英, 等. 河南省焦作地区白癜风流行病学调查[J]. 实用皮肤病学杂志, 2011, 4(1): 19-21
- [14] Abdel-Malek ZA, Jordan C, Ho T, et al. The enigma and challenges of vitiligo pathophysiology and treatment[J]. Pigment Cell Melanoma Res, 2020, 33(6): 778-787
- [15] 王禹毅, 王小琴. 白癜风与自身免疫性共病[J]. 重庆医学, 2022, 51(11): 1973-1976
- [16] 柏志芳, 刘霞, 宗淑芳, 等. 毫火针联合补肾活血方对寻常型白癜风患者外周血炎症因子和免疫指标的影响[J]. 现代生物医学进展, 2021, 21(4): 702-705
- [17] Okamura K, Garber M, Harris JE. Gaining Insight into Vitiligo Genetics through the Lens of a Large Epidemiologic Study[J]. J Invest Dermatol, 2021, 141(4): 718-721
- [18] Roberts GHL, Paul S, Yorgov D, et al. Family Clustering of Autoimmune Vitiligo Results Principally from Polygenic Inheritance of Common Risk Alleles[J]. Am J Hum Genet, 2019, 105(2): 364-372
- [19] Kussainova A, Kassym L, Akhmetova A, et al. Vitiligo and anxiety: A systematic review and meta-analysis [J]. PLoS One, 2020, 15(11): e0241445
- [20] Vallerand IA, Lewinson RT, Parsons LM, et al. Vitiligo and major depressive disorder: A bidirectional population-based cohort study[J]. J Am Acad Dermatol, 2019, 80(5): 1371-1379
- [21] Falk-Mahapatra R, Gollnick SO. Photodynamic Therapy and Immunity: An Update[J]. Photochem Photobiol, 2020, 96(3): 550-559
- [22] Baykal Selçuk L, Katkat E, Aksu Arica D, et al. Sun-protection habits and knowledge of patients with vitiligo [J]. Acta Dermatovenereol Alp Pannonica Adriat, 2020, 29(1): 7-10
- [23] 韩宪伟, 李铁男, 张涛. 白癜风发病影响因素的 Logistic 回归分析[J]. 中华中医药杂志, 2019, 34(2): 811-814
- [24] Ghosh S. Chemical Vitiligo: A Subset of Vitiligo [J]. Indian J Dermatol, 2020, 65(6): 443-449
- [25] Shakhbazova A, Wu H, Chambers CJ, et al. A Systematic Review of Nutrition, Supplement, and Herbal-Based Adjunctive Therapies for Vitiligo[J]. J Altern Complement Med, 2021, 27(4): 294-311
- [26] Wu X, Jin S, Yang Y, et al. Altered expression of ferroptosis markers and iron metabolism reveals a potential role of ferroptosis in vitiligo [J]. Pigment Cell Melanoma Res, 2022, 35(3): 328-341
- [27] 康安静, 苏宝山, 徐汉卿. 氧自由基及微量元素在白癜风黑素细胞凋亡中作用的研究[J]. 中华临床医药杂志, 2002, 3(18): 4-6
- [28] 黄珂珂, 邢梦, 蒯仂, 等. 白癜风与表观遗传学相关研究及展望[J]. 世界临床药物, 2020, 41(1): 64-68
- [29] 刘江波, 张学军. 白癜风相关环境因素研究回顾[J]. 国际皮肤性病杂志, 2007, 33(4): 219-221
- [30] 辛宁, 康晓静. 白癜风的 HLA 等位基因遗传学研究进展 [J]. 现代生物医学进展, 2010, 10(12): 2385-2387

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- [26] Zonnebeld N, Huberts W, van Loon MM, et al. Natural Vascular Remodelling After Arteriovenous Fistula Creation in Dialysis Patients With and Without Previous Ipsilateral Vascular Access[J]. Eur J Vasc Endovasc Surg, 2020, 59(2): 277-287
- [27] Zonnebeld N, Maas TMG, Huberts W, et al. Pre-operative Duplex Ultrasonography in Arteriovenous Fistula Creation: Intra- and Inter-observer Agreement[J]. Eur J Vasc Endovasc Surg, 2017, 54(5): 613-619
- [28] Zhu X, Gong X, Zhang B, et al. Application of Transcranial Color-coded Duplex Sonography in the Diagnosis and Management of Straight Sinus Thrombosis With Dural Arteriovenous Fistulae: A Case Report[J]. Neurologist, 2020, 25(6): 180-186
- [29] Yun SS, Mok S, Park SC, et al. Efficacy of blood flow measurement using intraoperative color flow Doppler ultrasound as a predictor of autologous arteriovenous fistula maturation [J]. Ther Apher Dial, 2022, 15(8): 1744-1749
- [30] Wang H, Su LH, Li ZL, et al. The value of color doppler ultrasonography in the diagnosis of endograft infections following endovascular aneurysm repair [J]. Natl Med J China, 2022, 102(1): 67-72