·临床研究·

老年2型糖尿病住院患者临床特征及非计划再入院的影响因素

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【摘 要】 **目的** 评估老年2型糖尿病(T2DM)住院患者临床特征,并分析非计划再入院的影响因素。**方法** 回顾性分析2021年10月至2023年8月于上海交通大学医学院苏州九龙医院住院治疗的204例老年T2DM患者的临床资料,记录病程、并发症等临床特征,并经医院住院病历信息系统筛选出院6个月内再入院患者作为再入院组(42例),6个月内未发生再入院者为非再入院组(162例)。采用SPSS 25.0统计软件进行数据处理。根据数据类型,分别采用t检验或χ^2检验进行组间比较。使用多因素logistic回归模型分析老年T2DM住院患者6个月内非计划再入院的影响因素。**结果** 204例老年T2DM住院患者T2DM病程以≥10年[56.86%(116/204)]居多;糖尿病慢性并发症以糖尿病周围神经病变[82.35%(168/204)]、糖尿病周围血管病变[42.16%(86/204)]居多;糖尿病慢性并发症数量以2种[61.76%(126/204)]居多;合并症以高血压[62.75%(128/204)]、高脂血症[23.53%(48/204)]居多。再入院组与非再入院组患者T2DM病程、糖尿病慢性并发症数量、老年营养风险指数(GNRI)及认知衰弱方面比较,差异有统计学意义($P<0.05$)。多因素logistic回归分析显示,T2DM病程≥10年($OR=2.421$,95%CI 1.284~4.564;$P<0.05$)、糖尿病慢性并发症≥3种($OR=3.124$,95%CI 1.836~5.315;$P<0.05$)、GNRI≤98($OR=2.524$,95%CI 1.368~4.660;$P<0.05$)及认知衰弱($OR=3.010$,95%CI 1.752~5.171;$P<0.05$)均为老年T2DM住院患者出院6个月内非计划再入院的危险因素。**结论** 长病程、具有2种糖尿病相关慢性并发症、合并高血压及高脂血症在老年T2DM住院患者中较为多见。T2DM病程≥10年、糖尿病慢性并发症≥3种、营养不良及认知衰弱可增加患者出院6个月内非计划再入院风险。

【关键词】 老年人;2型糖尿病;非计划再入院;认知衰弱;影响因素
【中图分类号】 R587.1 【文献标志码】 A 【DOI】 10.11915/j.issn.1671-5403.2025.12.196

Clinical characteristics of elderly inpatients with type 2 diabetes mellitus and influencing factors of unplanned readmission

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【Abstract】 **Objective** To evaluate the clinical characteristics of elderly inpatients with type 2 diabetes mellitus (T2DM) and to analyze the influencing factors of unplanned readmission. **Methods** A retrospective analysis was conducted of clinical data of 204 elderly T2DM patients who were hospitalized in Suzhou Jiulong Hospital of Shanghai Jiaotong University School of Medicine from October 2021 to August 2023. Clinical characteristics including disease duraiton and complications were recorded. The patients readmitted within six months after discharge were screened *via* hospital medical record information system as the readmission group ($n=42$), and those without readmission were included in the non-readmission group ($n=162$). SPSS 25.0 was used for data processing. According to the data type, t test or *Chi*-square test was used for comparison between groups. The influencing factors of unplanned readmission in elderly T2DM inpatients within six months were analyzed by multivariate logistic regression model. **Results** Among the 204 elderly T2DM inpatients, 56.86% (116/204) had a T2DM duration ≥ 10 years. Diabetic chronic complications were primarily peripheral neuropathy (82.35%, 168/204) and peripheral vascular disease (42.16%, 86/204). Most patients had two diabetic chronic complications (62.75%, 128/204), and comorbidities were mostly hypertension (61.76%, 126/204) and hyperlipidemia (23.53%, 48/204). Statistically significant differences were observed between the readmission group and the non-readmission group in T2DM duration, number of diabetic chronic complications, geriatric nutritional risk index (GNRI), and cognitive frailty ($P<0.05$). Multi-

收稿日期: 2024-12-14; **接受日期**: 2025-02-06
基金项目: 苏州市科技发展计划(SKJYD2021046);江苏省卫生健康委科研项目(H2022169)
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variate logistic regression analysis identified T2DM duration ≥ 10 years (*OR*=2.421, 95%*CI* 1.284-4.564; *P*<0.05), diabetic chronic complications ≥ 3 types (*OR*=3.124, 95%*CI* 1.836-5.315; *P*<0.05), GNRI≤ 98 (*OR*=2.524, 95%*CI* 1.368-4.660; *P*<0.05) and cognitive frailty (*OR*=3.010, 95%*CI* 1.752-5.171; *P*<0.05) as risk factors for unplanned readmission in elderly T2DM inpatients within six months after discharge. **Conclusion** Long course of disease, two diabetic chronic complications, hypertension, and hyperlipidemia are more common in elderly T2DM inpatients. T2DM duration ≥10 years, diabetic chronic complications ≥ 3 types, malnutrition and cognitive frailty can increase the risk of unplanned readmission within six months after discharge.

【Key words】 aged; diabetes mellitus, type 2; unplanned readmission; cognitive frailty; influencing factors

This work was supported by Suzhou Science and Technology Development Plan (SKJYD2021046) *and Scientific Research Project of Jiangsu Commission of Health* (H2022169).

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作为全球面临的公共卫生问题,2型糖尿病(type 2 diabetes mellitus,T2DM)全球患病人数已超过4亿,其高患病率、高并发症率及高致残率带来的医疗支出给患者及家庭、社会均造成沉重负担[1]。增龄是糖尿病的高危因素,老年人是T2DM的易患人群,我国已进入老龄化社会,老年T2DM患病人数较既往大幅增加[2]。大部分T2DM患者可在门诊或社区医疗机构接受诊疗,但老年患者各器官功能减退、基础疾病多,常因疾病管理不佳而住院治疗,以延缓病情进展[3]。近年研究发现,T2DM患者再入院率超过22%,非计划再入院为出院后无法预测的再入院,是医疗服务质量的重要评估指标,老年T2DM患者非计划再入院率较高,也是导致医疗经济负担加重的主要原因[4]。基于此,本研究对老年T2DM住院患者临床特征及其非计划再入院的影响因素展开调查,为老年T2DM的疾病管理提供参考数据。

1 对象与方法

1.1 研究对象

回顾性分析2021年10月至2023年8月于上海交通大学医学院苏州九龙医院住院的204例老年T2DM患者的临床资料。纳入标准:T2DM诊断符合《中国2型糖尿病防治指南(2020年版)》[5];年龄≥65岁;出院时均由内分泌科医师医嘱指导出院;实验室检查、认知功能调查等资料完整。排除标准:既往帕金森、癫痫等中枢神经系统器质性疾病史;合并痴呆或视听功能障碍;合并感染、恶性肿瘤;因烧伤、车祸伤、切割伤再入院;计划性再入院。以出院日期与再次入院日期相差≤6个月为6个月内再入院[6],经医院住院病历信息系统筛选出6个月内再入院患者作为再入院组(42例),未发生6个月内再入院为非再入院组(162例)。

1.2 方法

1.2.1 资料收集 由住院病历信息系统中入院记录单获取患者性别、年龄、T2DM病程、并发症、合并症等资料。

1.2.2 实验室检查 收集入院首次空腹静脉血的检查单,包括空腹血糖、糖化血红蛋白、血肌酐、血尿酸、白蛋白等,使用自动生化分析仪(贝克曼AU5800)检测。使用老年营养风险指数(geriatric nutritional risk index,GNRI)[7]评估患者是否存在营养不良。GNRI=1.489×血清白蛋白(g/L)+41.7×实际体质量(kg)/理想体质量(kg)。GNRI≤98提示患者存在营养状况不良。

1.2.3 认知衰弱评估 在入院2 h内评估患者是否存在认知衰弱。该概念由国际营养与衰老研究所Kelaiditi等[8]专家提出,Frail量表[9]评估为衰弱(≥3分),简易精神状态量表[10]评估为认知功能障碍(文盲<17分,小学学历<20分,初中及以上学历<24分),临床痴呆评定量表[11]评估为可疑痴呆(0.5分),同时排除明确诊断的痴呆,即可判断为认知衰弱。

1.3 统计学处理

采用SPSS 25.0统计软件进行数据分析。计量资料以均数±标准差($\bar{x}\pm s$)表示,组间比较采用t检验。计数资料以例数(百分率)表示,组间比较采用χ^2检验。采用多因素logistic回归模型分析老年T2DM住院患者出院6个月内非计划再入院的影响因素。P<0.05为差异有统计学意义。

2 结 果

2.1 老年T2DM住院患者临床特征

204例老年T2DM住院患者男性占比54.90%,年龄以65~75岁(54.90%)为主,体质量指数以18.5~24.0 kg/m^2(70.59%)居多,T2DM病程以10年以上者(56.86%)居多,胰岛素治疗者占65.69%,糖尿病慢性并发症以糖尿病周围神经病变(82.35%)、糖尿病周围血管病变(42.16%)居多,糖尿病慢性并发症数量以2种(61.76%)居多,糖尿病酮症酸中毒占比10.78%,合并症以高血压(62.75%)、高脂

血症(23.53%)居多(表 1)。

表 1 患者临床特征分析

Table 1 Analysis of clinical characteristics of patients

(n=204)

Item	n	Composition ratio(%)
Gender		
Male	112	54.90
Female	92	45.10
Age		
65-75 years	112	54.90
≥75 years	92	45.10
Body mass index		
<18.5 kg/m^2	22	10.78
18.5-24.0 kg/m^2	144	70.59
≥24.0 kg/m^2	38	18.63
T2DM duration		
<10 years	88	43.14
≥10 years	116	56.86
Insulin therapy	134	65.69
Diabetic peripheral vascular disease	86	42.16
Diabetic retinopathy	72	35.29
Diabetic foot	14	6.86
Diabetic nephropathy	80	39.22
Diabetic peripheral neuropathy	168	82.35
Diabetic ketoacidosis	22	10.78
Number of chronic complications of diabetes mellitus		
≤1 type	34	16.67
2 types	126	61.76
≥3 types	44	21.57
Hypertension	128	62.75
Hyperlipidemia	48	23.53
Coronary heart disease	40	19.61
Cerebrovascular disease	20	9.80

T2DM: type 2 diabetes mellitus.

2.2 两组患者临床资料

再入院组与非再入院组患者 T2DM 病程、糖尿病慢性并发症数量、GNRI 及认知衰弱情况比较,差异有统计学意义(P<0.05);空腹血糖、糖化血红蛋白、血肌酐、血尿酸、甘油三酯、总胆固醇、白蛋白等一般资料比较,差异无统计学意义(P>0.05;表 2)。

2.3 患者出院 6 个月内非计划再入院的影响因素

以出院 6 个月内非计划再入院为因变量,单因素分析中有统计学意义的指标作为自变量,行多因素 logistic 回归分析,结果显示,T2DM 病程≥10 年、糖尿病慢性并发症≥3 种、GNRI≤98 及认知衰弱均为出院 6 个月内非计划再入院的危险因素(P<0.05;表 3)。

3 讨 论

随着全球老龄化的加剧,老年疾病管理需求明显增多,据报道,我国≥65 岁的人口占总人口的 12.6%,而≥65 岁的老年糖尿病患病人数高达 3550 万,占全球总老年糖尿病患病人数的 25%[12]。T2DM 是老年糖尿病的主要类型,由于老年 T2DM 患者常合并多种慢性疾病,其疾病管理难度较大,住院风险高[13]。本研究结果显示,老年 T2DM 住院患者病程以≥10 年的长病程居多,提示长期慢性高血糖可能对患者神经、血管等造成不可逆的损伤,导致疾病控制难度增加,住院需求升高[14]。另外,老年 T2DM 住院患者的糖尿病相关并发症及合并症被认为是疾病管理难度大及反复住院的重要因素,多种并发症与合并症的累及造成靶器官损伤增加,致残及致死风险升高[15]。本研究中,老年 T2DM 住院患者糖尿病慢性并发症数量以 2 种居多,并以糖尿病周围神经病变、糖尿病周围血管病变居多,合并症则以高血压、高脂血症更为多见,与目前的报道相似[15]。

非计划再入院是被国内外认可的医疗服务质量考核项目,老年糖尿病患者非计划再入院率较高,有研究指出,老年 T2DM 患者出院后 3 个月内再入院率超过 35%,值得临床重视[16]。本研究对本院老年 T2DM 住院患者出院 6 个月内非计划再入院的影响因素展开分析,结果显示,糖尿病慢性并发症≥3 种为其危险因素,提示由 T2DM 引起的多种慢性并发症是增加患者非计划再入院风险的关键因素,可能与老年患者自身器官功能逐渐衰退、慢性并发症多、各器官功能恶化更严重、管理更困难有关[17]。不仅如此,T2DM 病程≥10 年也是患者出院 6 个月内非计划再入院的危险因素,一方面,与病程越长者胰岛功能衰退越多、血糖控制越困难、需短期内重复入院治疗有关[18];另一方面,与长期高血糖或血糖波动对各器官组织损伤较大、更易发生糖尿病相关慢性并发症有关,患者出院后病情恶化风险更高[19]。因此,对于合并多种慢性并发症及长病程的老年 T2DM 患者,应加强出院后管理,建议联合社区医疗机构、老年保障机构等部门,完善对患者的定期随访工作,以及时发现患者病情恶化情况,尽早实施干预措施。

表2 两组患者临床资料比较

Table 2 Comparison of clinical data between two groups

Item	Readmission group(n=42)	Non-readmission group(n=162)	χ^2/t	P value
Gender[n(%)]			0.107	0.743
Male	24(57.14)	88(54.32)		
Female	18(42.86)	74(45.68)		
Age[n(%)]			1.995	0.158
65-75 years	19(45.24)	93(57.41)		
≥75 years	23(54.76)	69(42.59)		
Body mass index(kg/m^2, $\bar{x}\pm s$)	22.39±2.07	23.06±1.98	1.936	0.054
T2DM duration[n(%)]			17.948	<0.001
<10 years	6(14.29)	82(50.62)		
≥10 years	36(85.71)	80(49.38)		
Insulin therapy[n(%)]	30(71.43)	104(64.20)	0.774	0.379
Diabetic peripheral vascular disease[n(%)]	20(47.62)	66(40.74)	0.647	0.421
Diabetic retinopathy[n(%)]	19(45.24)	53(32.72)	2.290	0.130
Diabetic foot[n(%)]	4(9.52)	10(6.17)	0.586	0.444
Diabetic nephropathy[n(%)]	18(42.86)	62(38.27)	0.294	0.588
Diabetic peripheral neuropathy[n(%)]	19(90.48)	65(80.25)	2.401	0.121
Diabetic ketoacidosis[n(%)]	6(14.29)	16(9.88)	0.294	0.588
Number of chronic complications of diabetes mellitus[n(%)]			25.196	<0.001
≤1 type	2(4.76)	32(19.75)		
2 types	20(47.62)	108(66.67)		
≥3 types	20(47.62)	22(13.58)		
Hypertension[n(%)]	26(61.90)	102(62.96)	0.016	0.899
Hyperlipidemia[n(%)]	12(28.57)	36(22.22)	0.747	0.387
Coronary heart disease[n(%)]	10(23.81)	30(18.52)	0.592	0.442
Cerebrovascular disease[n(%)]	6(14.29)	14(8.64)	0.648	0.421
Fasting blood glucose(mmol/L, $\bar{x}\pm s$)	8.93±1.22	8.65±1.19	1.352	0.178
Glycosylated hemoglobin(%, $\bar{x}\pm s$)	7.32±1.05	7.09±0.98	1.335	0.183
Serum creatinine(μmol/L, $\bar{x}\pm s$)	116.98±17.44	112.45±16.35	1.578	0.116
Blood uric acid(μmol/L, $\bar{x}\pm s$)	439.25±21.79	432.78±22.51	1.671	0.096
Triglyceride(mmol/L, $\bar{x}\pm s$)	1.45±0.25	1.38±0.23	1.726	0.086
Total cholesterol(mmol/L, $\bar{x}\pm s$)	4.33±0.81	4.17±0.75	1.212	0.227
Albumin(g/L, $\bar{x}\pm s$)	35.89±5.41	37.42±5.09	1.714	0.088
GNRI[n(%)]			13.483	<0.001
≤98	34(80.95)	80(49.38)		
>98	8(19.05)	82(50.62)		
Cognitive frailty[n(%)]	28(66.67)	52(32.10)	16.720	<0.001

T2DM: type 2 diabetes mellitus; GNRI: geriatric nutritional risk index.

表3 患者出院6个月内非计划再入院的多因素logistic回归分析

Table 3 Multivariate logistic regression analysis of unplanned readmission within six months after discharge

Factor	β	SE	$Wald\ \chi^2$	P value	OR	95%CI
T2DM duration ≥10 years	0.884	0.279	10.039	0.002	2.421	1.284-4.564
Number of chronic complications of diabetes mellitus≥3 types	1.139	0.318	12.829	<0.001	3.124	1.836-5.315
GNRI≤98	0.926	0.285	10.557	0.001	2.524	1.368-4.660
Cognitive frailty	1.102	0.311	12.556	<0.001	3.010	1.752-5.171

T2DM: type 2 diabetes mellitus; GNRI: geriatric nutritional risk index.

营养状态是影响老年人群衰弱状态的重要因素，营养不良者更易出现骨骼肌功能减退，造成老年患者跌倒风险升高[20]。本研究结果显示，GNRI≤98 是老年 T2DM 患者出院 6 个月内非计划再入院的危险因素，这可能与营养状态较差者更易因跌倒而发生非计划再入院有关。认知衰弱为近年提出的新概念，为老年患者独有的特殊病理生理特征，是躯体衰弱与认知障碍同时发生的临床综合征，可导致患者生活自理能力下降，使失能、死亡风险升高[21]。本研究结果显示，认知衰弱也是老年 T2DM 患者非计划再入院的危险因素，分析原因可能为认知衰弱导致老年 T2DM 患者自理能力减弱，且自我管理能力较差，导致跌倒风险及血糖控制不佳风险升高，易在短期内再入院[22]。因此，对于营养状态不佳及存在认知衰弱的老年 T2DM 患者，出院宣教时应向患者及其家属强调跌倒风险，营养状态不佳者出院后应维持优质蛋白饮食，自理能力不佳者出院后应在家属、陪护等人员的陪伴及协助下生活，避免跌倒风险较高的行为。然而，本研究为单中心小样本量研究，结果的可靠性及代表性有所欠缺，未来还需联合其他医疗机构开展大样本量的多中心研究，对本研究结果加以验证。

综上所述，老年 T2DM 住院患者以长病程及多种糖尿病相关慢性并发症居多，合并高血压及高脂血症也较为常见。10 年及以上的 T2DM 病程、3 种及以上的糖尿病慢性并发症、GNRI≤98 及认知衰弱是老年 T2DM 住院患者出院 6 个月内非计划再入院的危险因素，可为老年 T2DM 的临床管理提供参考。

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(编辑：郑真真)