

· 临床研究 ·

高龄肺部感染患者发生吸入性肺炎的临床特点及危险因素

曹桂花, 王晓明, 葛伟*

(空军军医大学西京医院老年病科, 西安 710032)

【摘要】目的 分析高龄肺部感染患者发生吸入性肺炎(AP)的临床特点及危险因素。**方法** 回顾性研究2013年1月至2016年1月在空军军医大学西京医院老年病科住院治疗的高龄(≥ 80 岁)医院获得性肺部感染患者共212例,依据是否发生AP分为2组:AP组($n=61$)和非AP组($n=151$)。收集患者临床资料,包括性别、年龄、基础疾病、用药史等,分析高龄肺部感染患者发生AP的临床特点及危险因素。采用SPSS 18.0软件进行数据处理。**结果** 212例高龄肺部感染患者中,61例(占35.4%)发生AP。2组患者痰培养均以革兰氏阴性菌感染为主。AP组住院时间较非AP组[(21.4 $\pm$ 2.1)和(15.7 $\pm$ 3.1)d]显著延长($P=0.034$),病死率较非AP组显著增高(24.6%和8.0%, $P=0.002$)。多因素logistic回归分析发现,年龄大($OR=4.897$,95% CI 3.556~7.878)、认知障碍($OR=6.799$,95% CI 2.931~9.443)、吞咽功能障碍($OR=8.345$,95% CI 1.062~5.133),以及服用抑酸药($OR=4.667$,95% CI 4.283~8.343)、镇静药($OR=3.886$,95% CI 1.944~7.174)、硝酸酯类药物($OR=3.445$,95% CI 2.977~6.437)、钙离子拮抗剂($OR=3.568$,95% CI 4.345~7.868)、血管紧张素转化酶抑制剂/血管紧张素II受体阻滞剂(ACEI/ARB)($OR=6.876$,95% CI 2.192~9.458)是高龄肺部感染患者发生AP的独立危险因素($P<0.05$)。**结论** 高龄肺部感染患者AP发生率高。年龄大、认知障碍、吞咽功能障碍及服用抑酸药、镇静药、硝酸酯类、钙离子拮抗剂、ACEI/ARB是高龄肺部感染患者发生AP的独立危险因素。

【关键词】 老年人,80以上;吸入性肺炎;危险因素

【中图分类号】 R592; R563

【文献标志码】 A

【DOI】 10.11915/j.issn.1671-5403.2019.09.148

Clinical characteristics and risk factors of aspiration pneumonia in ≥ 80 years old patients with pulmonary infection

CAO Gui-Hua, WANG Xiao-Ming, GE Wei*

(Xijing Hospital, Air Force Medical University of PLA, Xi'an 710032, China)

【Abstract】Objective To analyze the clinical characteristics and risk factors of aspiration pneumonia (AP) in very elderly patients with pulmonary infection. **Methods** A retrospective study was conducted of a total of 212 elderly patients (≥ 80 years old) with pulmonary infection who were hospitalized in the Geriatric Department of Xijing Hospital from January 2013 to January 2016. They were divided into two groups: AP group ($n=61$) and non-AP group ($n=151$). Clinical data of the patients were collected, including gender, age, BMI, underlying diseases, medication history, etc., for the analysis of the clinical characteristics and risk factors of aspiration pneumonia in very elderly patients. SPSS statistics 18.0 was used for data analysis. **Results** Of the 212 elderly patients with pulmonary infection, 61 (35.4%) developed aspiration pneumonia. Sputum cultures were mainly Gram-negative in both groups. The length of hospital stay in the AP group was significantly longer than that in the non-AP group [(21.4 $\pm$ 2.1) vs (15.7 $\pm$ 3.1) d, $P=0.034$], and the mortality rate was significantly higher than that in the non-AP group (24.6% vs 8.0%, $P=0.002$). The subjects in the observation group had more cognitive impairment, swallowing dysfunction, hypothyroidism, and a history of long-term use of angiotensin converting enzyme inhibitor/angiotensin II receptor blocker (ACEI/ARB) antihypertensive drugs ($P<0.05$). Multivariate logistic regression analysis found that advanced age ($OR=4.897$, 95% CI 3.556~7.878), cognitive impairment ($OR=6.799$, 95% CI 2.931~9.443), swallowing dysfunction ($OR=8.345$, 95% CI 1.062~5.133), and acid-suppressing drugs ($OR=4.667$, 95% CI 4.283~8.343), sedatives ($OR=3.886$, 95% CI 1.944~7.174), nitrates ($OR=3.445$, 95% CI 2.977~6.437), calcium antagonist ($OR=3.568$, 95% CI 4.345~7.868), ACEI/ARB ($OR=6.876$, 95% CI 2.192~9.458) were independent risk factors for AP in elderly patients with pulmonary infection ($P<0.05$). **Conclusion** The incidence of AP is high in elderly patients. Advanced age,

收稿日期: 2019-05-13; 接受日期: 2019-07-23

通信作者: 葛伟, E-mail: geweidr@fmmu.edu.cn

cognitive impairment, swallowing dysfunction and long-term use of ACEI/ARB antacids, sedatives, nitrates, calcium antagonists, and ACEI/ARB antihypertensive drugs are independent risk factors for the occurrence of AP in elderly people with pulmonary infection.

【Key words】 aged, 80 and over; aspiration pneumonia; risk factors

Corresponding author: GE Wei, E-mail: geweidr@fmmu.edu.cn

吸入性肺炎 (aspiration pneumonia, AP) 是指吸入口咽的分泌物、食物、胃内容物等所致的肺实质炎症,多见于老年患者^[1]。高龄肺部感染人群的 AP 发生率则更高,且症状不典型^[2]。有报道称,AP 患者的隐性误吸发生率高达 40%~70%,在继发细菌感染后致病菌易出现耐药,药物治疗效果差,住院时间长,病死率高,给家庭和社会带来沉重的负担^[3]。本研究对空军军医大学西京医院老年病科收治的高龄医院获得性肺部感染患者的临床资料进行回顾性研究,分析高龄 AP 患者的临床特点及危险因素,为 AP 的预防、诊断和治疗提供参考和指导。

1 对象与方法

1.1 研究对象

纳入 2013 年 1 月至 2016 年 1 月在我科住院治疗的高龄 (≥ 80 岁) 医院获得性肺部感染患者共 212 例为研究对象。纳入标准: (1) ≥ 80 岁; (2) 医院获得性肺部感染。排除标准: (1) 存在影响白细胞计数的非感染相关性疾病; (2) 合并其他系统感染; (3) 发生肺部感染后生存时间 ≤ 24 h。依据是否发生 AP 分为 2 组: AP 组 ($n = 61$) 和非 AP 组 ($n = 151$)。其中 AP 组年龄 $80 \sim 100 (87.0 \pm 2.1)$ 岁,非 AP 组年龄 $80 \sim 98 (82.6 \pm 2.3)$ 岁。

AP 的诊断标准^[4]: (1) X 线胸片或胸部 CT 检查提示片状浸润性阴影或间质性改变 (影像学双肺病变多见,大部分患者有下叶 AP,且以胸膜下为主,这与老年人长期平卧有关); (2) 有明确误吸史或存在与误吸相关的多个危险因素; (3) 有以下表现之一: ①发热或热型改变; ②痰量明显增多或性状改变; ③肺部出现啰音和 (或) 肺实变体征; ④白细胞总数及中性粒细胞百分比升高。

1.2 方法

收集研究对象的临床资料,包括性别、年龄、体质指数 (body mass index, BMI)、吞咽功能障碍 (指由多种原因引起的、发生于不同部位的吞咽时咽下困难^[5])、吸烟史及饮酒史、基础疾病 [冠心病、高血压、慢性阻塞性肺疾病 (chronic obstructive pulmonary disease, COPD) 等]、鼻饲管置管、用药史 [抑酸药、血管紧张素转化酶抑制剂/血管紧张素 II 受体阻滞剂 (angiotensin converting enzyme inhibitors/angiotensin

receptor blocker, ACEI/ARB) 等]、痰培养结果、白细胞计数、降钙素原 (procalcitonin, PCT)、C-反应蛋白 (C-reactive protein, CRP) 等。2 组患者均给予经验性抗感染治疗,收集患者的住院天数、病死率等临床资料,并进行比较。

1.3 统计学处理

采用 SPSS 18.0 软件进行数据处理。计量资料以均数 $\pm$ 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。对单因素分析有统计学意义的指标进行多因素 logistic 回归分析,筛选出独立的危险因素。 $P < 0.05$ 为差异具有统计学意义。

2 结果

2.1 一般资料

212 例高龄医院获得性肺部感染患者中,有 61 例发生 AP,发生率为 35.4%。2 组患者痰培养均以革兰氏阴性菌感染为主,主要包括肺炎克雷伯菌、大肠埃希菌、铜绿假单胞菌、鲍曼不动杆菌等;感染的革兰氏阳性菌主要包括肺炎链球菌、金黄色葡萄球菌等;感染的真菌以白色假丝酵母菌为主,少见曲霉菌。与非 AP 组相比,AP 组患者的年龄显著增加,患有认知障碍、吞咽功能障碍、甲状腺功能减退者显著增多,服用抑酸药、镇静药、硝酸酯类、糖皮质激素、钙离子拮抗剂、ACEI/ARB 药物史者也显著增多,而白细胞计数显著降低,差异均具有统计学意义 ($P < 0.05$; 表 1)。

2.2 2 组患者预后比较

AP 组住院时间为 (21.4 ± 2.1) d,较非 AP 组住院时间 [(15.7 ± 3.1) d] 显著延长 ($t = 4.337$, $P = 0.034$)。AP 组和非 AP 组分别死亡 15 和 12 例,AP 组病死率显著高于非 AP 组 (24.6% 和 8.0%, $\chi^2 = 1.034$, $P = 0.002$)。

2.3 高龄肺部感染患者发生 AP 的多因素 logistic 回归分析

多因素 logistic 回归分析发现,年龄大、认知障碍、吞咽功能障碍、服用抑酸药、服用镇静药、服用硝酸酯类药物、服用钙离子拮抗剂、服用 ACEI/ARB 是高龄肺部感染患者发生 AP 的独立危险因素 ($P < 0.05$; 表 2)。

表 1 2组患者临床资料比较
Table 1 Comparison of baseline data between two groups

Item	AP group (n=61)	Non-AP group (n=115)	t/χ ²	P value
Age(years, $\bar{x}\pm s$)	87.0±2.1	82.6±2.3	5.321	0.003
Male[n(%)]	30(49.2)	73(48.3)	2.116	0.766
Smoking history[n(%)]	12(19.7)	32(21.2)	3.112	0.456
Drinking history[n(%)]	9(14.8)	22(14.6)	2.455	0.065
Hypertension[n(%)]	25(41.0)	68(45.0)	6.677	0.321
CHD[n(%)]	22(36.0)	29(31.1)	8.342	0.053
Diabetes mellitus[n(%)]	10(16.4)	27(17.9)	6.375	0.124
COPD[n(%)]	5(8.2)	15(9.9)	2.848	0.085
Cognitive impairment[n(%)]	27(44.2)	30(19.9)	5.117	0.029
Swallowing disorder[n(%)]	18(29.3)	28(18.5)	8.721	0.023
Hypothyroidism[n(%)]	9(14.8)	8(5.3)	3.168	0.017
Pathogenic bacteria[n(%)]				
Gram-negative bacteria	31(50.8)	79(52.3)	2.125	0.128
Gram-positive bacteria	13(21.3)	30(19.9)	3.781	0.081
Fungus	3(4.9)	10(6.6)	5.112	0.423
Others	14(23.0)	32(21.1)	2.114	0.582
Medication history[n(%)]				
Acid suppression drugs	17(27.9)	12(8.0)	2.729	0.003
Sedatives	9(14.8)	5(3.3)	9.345	0.022
Statins	52(85.2)	125(82.8)	6.111	0.504
Nitrates	20(32.8)	25(16.6)	2.678	0.021
Calcium antagonism	25(15.2)	25(15.2)	7.123	0.047
ACEI/ARB	25(15.2)	12(7.9)	6.898	0.002
Glucocorticoid	12(19.6)	9(6.0)	4.234	0.015
Invasive airway[n(%)]	4(7.0)	9(6.0)	3.336	0.168
Nasogastric feeding tube[n(%)]	7(11.5)	19(12.6)	4.776	0.842
White blood cells($\times 10^9$, $\bar{x}\pm s$)	10.3±2.5	11.6±1.4	4.187	0.032
CPR(mg/L, $\bar{x}\pm s$)	42.7±6.6	41.5±7.5	5.443	0.721
PCT(ng/ml, $\bar{x}\pm s$)	0.326±0.016	0.305±0.011	4.832	0.226

AP: aspiration pneumonia; CHD: coronary heart disease; COPD: chronic obstructive pulmonary disease; ACEI/ARB: angiotensin converting enzyme inhibitors/angiotensin receptor blocker; CRP: C-reactive protein; PCT: procalcitonin.

表 2 高龄肺部感染患者发生 AP 的多因素非条件 logistic 回归分析
Table 2 Multivariate unconditional logistic regression analysis of risk factors for AP in ≥80 years old patients with pulmonary infection

Factor	B	SE	OR	Wald	95%CI	P value
Age	2.314	0.661	4.897	12.252	3.556–7.878	0.012
Cognitive impairment	3.327	1.167	6.799	8.128	2.931–9.443	0.004
Swallowing disorder	1.266	0.315	8.345	16.157	1.062–5.133	0.023
Hypothyroidism	1.001	0.526	2.347	3.621	0.589–8.133	0.081
Acid suppression drugs	3.216	2.135	4.667	2.269	4.283–8.343	0.002
Sedatives	2.876	0.851	3.886	11.423	1.944–7.174	0.034
Nitrates	1.456	0.611	3.445	5.679	2.977–6.437	0.041
Glucocorticoid	1.211	0.403	4.162	9.030	0.673–2.137	0.387
Calcium antagonism	2.121	0.531	3.568	15.953	4.345–7.868	0.001
ACEI/ARB	1.238	0.474	6.876	6.822	2.192–9.458	0.024

AP: aspiration pneumonia; ACEI/ARB: angiotensin converting enzyme inhibitors/angiotensin receptor blocker.

3 讨论

AP 最常发生于老年人群,随着年龄增长,AP 在老年肺部感染患者中的比例逐渐增大。有研究表

明,年龄每增加 1 岁,卒中相关 AP 风险增加 1.113 倍^[6]。在高龄肺部感染人群中,发生 AP 患者的 AP 临床症状不典型,可表现为精神状态差、食欲减退、尿失禁等,容易漏诊,且此类患者易出现多重耐药

菌,需要使用广谱抗感染药物治疗,治疗时间长,病死率高。因此,重视 AP 在高龄肺部感染人群中的防治具有重要临床意义。

本研究结果表明,年龄、认知障碍、吞咽功能障碍是高龄肺部感染患者发生 AP 的独立危险因素,发生 AP 后患者住院时间延长,病死率明显升高。正常状态下,人体具有抗返流机制(包括抗返流屏障、黏膜屏障及食管的清除作用);老年患者食管括约肌松弛,导致抗胃-食管返流的生理屏障作用下降,误吸风险增加。再者,随着年龄增长,机体肺活量减少、肺顺应性下降、扩散功能降低、咳嗽反射减弱、吞咽功能下降,因而高龄是 AP 发生的重要因素之一^[7]。多项临床研究表明,认知功能障碍与 AP 密切相关,阿尔茨海默病、血管性痴呆、帕金森等均可造成认知障碍^[8]。认知功能障碍者 AP 发生率明显增加的原因如下:(1)认知功能障碍者不仅活动及认知功能下降,呼吸道清除能力也会下降,舌肌松弛,分泌物排出困难,胃肠蠕动功能减弱,胃排空延迟,易患胃潴留;(2)卧床时间相对多,导致患者抵御胃肠反流能力减弱;(3)常合并神经系统疾病,由此导致的颅内压增高易致患者呕吐^[9]。吞咽障碍者的口腔分泌物及食物滞留增多,极易发生误吸。Feinberg 等^[10]对 152 例老年肺部感染患者行咽食管的动态造影和胸部 X 线检查,发现近 1/3 的患者患有 AP,其中约 2/3 是因吞咽障碍所致。临床上,吞咽功能障碍的最常见诱因是脑卒中,吞咽功能障碍者 AP 的发生率明显升高^[11]。

本研究结果发现,服用抑酸药、镇静药、硝酸酯类药物、钙离子拮抗剂、ACEI/ARB 均可增加高龄肺部感染患者发生 AP 的风险,这与国内外很多研究结果一致。长期应用抑酸药会导致肠道微生态紊乱,减弱肠屏障功能,导致胃肠功能紊乱,易出现呕吐、呃逆等不适,增加误吸的风险^[12]。镇静剂可作用于中枢神经系统,影响患者的意识及认知状态,从而增加 AP 的发生风险^[13]。服用硝酸酯类、钙离子拮抗剂、ACEI/ARB 药物可导致平滑肌松弛,降低老年患者下食管括约肌张力,从而增加 AP 的发生率^[14,15]。

综上,高龄肺部感染患者是发生 AP 的高危人群,易误诊,病死率高,病原菌以革兰氏阴性菌感染为主。诸多危险因素可导致误吸,误吸的发生重在预防,年龄是不可逆的危险因素,早期通过临床手段改善患者的认知状态及吞咽功能,合理使用抑酸药、镇静药、硝酸酯类、钙离子拮抗剂、ACEI/ARB 类药物可降低 AP 的发生。本研究的不足之处在于样本

量较小,尚需开展大规模的临床研究进一步明确误吸发生的临床特点及危险因素,制定有效的预防措施,降低 AP 的发生,提高高龄患者的生活质量。

【参考文献】

- [1] Teramoto S, Kawashima M, Komiya K, *et al.* Health-care-associated pneumonia is primarily due to aspiration pneumonia[J]. *Chest*, 2009, 136(6): 1702-1703. DOI: 10.1378/chest.09-1204.
- [2] 孙铁英,马正中,李燕明,等.老年人肺炎的尸检病理与临床结果对照分析[J]. *中华医学杂志*, 2008, 88(5): 302-306. DOI: 10.3321/j.issn:0376-2491.2008.05.004.
Sun TY, Ma ZZ, Li YM, *et al.* Comparative analysis of clinical and pathological characteristics of pneumonia in the elderly[J]. *Chin Med J*, 2008, 88(5): 302-306. DOI: 10.3321/j.issn:0376-2491.2008.05.004.
- [3] 宁璞,杨菁菁,孙铁英,等.住院老年人吸入性肺炎患病率及其危险因素分析[J]. *中华老年医学杂志*, 2017, 36(4): 428-432. DOI: 10.3760/ema.j.issn.0254-9026.2017.04.018.
Ning P, Yang JJ, Sun TY, *et al.* Prevalence and risk factors of aspiration pneumonia in hospitalized elderly patients[J]. *Chin J Gerontol*, 2017, 36(4): 428-432. DOI: 10.3760/ema.j.issn.0254-9026.2017.04.018.
- [4] 方荣,施荣,欧阳洋,等.老年吸入性肺炎的诊治策略[J]. *中国急救医学*, 2016, 36(2): 126-129. DOI: 10.3969/j.issn.1002-1949.2016.02.005.
Fang R, Shi R, Ouyang Y, *et al.* Diagnosis and treatment of aspiration pneumonia in the elderly[J]. *Chin Emerg Med*, 2016, 36(2): 126-129. DOI: 10.3969/j.issn.1002-1949.2016.02.005.
- [5] 中国老年医学学会营养与食品安全分会,中国循证医学中心,中国循证医学杂志编辑委员会,等.老年吞咽障碍患者家庭营养管理中国专家共识(2018版)[J]. *中国循证医学杂志*, 2018, 18(6): 547-559. DOI: 10.7507/1672-2531.20180532.
Branch of Nutrition and Food Safety, Chinese Geriatrics Society, Chinese Cochrane Centre, Editorial Board of Chinese Journal of Evidence-Based Medicine, *et al.* Consensus of Chinese experts on family nutrition management for elderly patients with dysphagia (2018 edition)[J]. *Chin J Evid-Based Med*, 2018, 18(6): 547-559. DOI: 10.7507/1672-2531.20180532.
- [6] Sui R, Zhang L. Risk factors of stroke-associated pneumonia in Chinese patients[J]. *Neurol Res*, 2011, 33(5): 508-513. DOI: 10.1179/016164111X13007856084205.
- [7] Omari TI, Kritas S, Cock C, *et al.* Swallowing dysfunction in healthy older people using pharyngeal pressure-flow analysis[J]. *Neurogastroenterol Motil*, 2014, 26(1): 59-68. DOI: 10.1111/nmo.12224.
- [8] Naruishi K, Nishikawa Y, Kido JI, *et al.* Relationship of aspiration pneumonia to cognitive impairment and oral condition: a cross-sectional study[J]. *Clin Oral Investig*, 2018, 22(7): 2575-2580. DOI: 10.1007/s00784-018-2356-7.
- [9] Foley NC, Affoo RH, Martin RE. A systematic review and meta-analysis examining pneumonia-associated mortality in dementia[J]. *Dement Geriatr Cogn Disord*, 2015, 39(1-2): 52-67. DOI: 10.

- 1159/000367783.
- [10] Feinberg MJ, Knebl J, Tully J. Prandial aspiration and pneumonia in an elderly population followed over 3 years[J]. Dysphagia, 1996, 11(2): 104-109.
- [11] Cintra MT, de Rezende NA, de Moraes EN, *et al.* A comparison of survival, pneumonia, and hospitalization in patients with advanced dementia and dysphagia receiving either oral or enteral nutrition[J]. J Nutr Health Aging, 2014, 18(10): 894-899. DOI: 10.1007/s12603-014-0487-3.
- [12] 张艺军, 钟武装, 郭振辉. 质子泵抑制剂对老年人肠屏障功能的影响[J]. 中华老年医学杂志, 2018, 37(3): 291-294. DOI: 10.3760/cma.j.issn.0254-9026.2018.03.012.
- Zhang YJ, Zhong WZ, Guo ZH. Effects of proton pump inhibitors on intestinal barrier function in the elderly[J]. Chin J Gerontol, 2018, 37(3): 291-294. DOI: 10.3760/cma.j.issn.0254-9026.2018.03.012.
- [13] Erdogan MA, Demirbilek S, Erdil F, *et al.* The effects of cognitive impairment on anaesthetic requirement in the elderly[J]. Eur J Anaesthesiol, 2012, 29(7): 326-331. DOI: 10.1097/EJA.0b013e32835475c6.
- [14] Akram MF, Nasiruddin M, Ahmad Z, *et al.* Doxofylline and theophylline: a comparative clinical study[J]. J Clin Diagn Res, 2012, 6(10): 1681-1684. DOI: 10.7860/JCDR/2012/4697.2643.
- [15] 赵铁梅. 老年下呼吸道感染病原学特点及对策[J]. 中华老年多器官疾病杂志, 2017, 16(3): 177-181. DOI: 10.11915/j.issn.1671-5403.2017.03.041.
- Zhao TM. Etiologic characteristics and therapeutic strategies of lower respiratory infections in the elderly[J]. Chin J Mult Organ Dis Elderly, 2017, 16(3): 177-181. DOI: 10.11915/j.issn.1671-5403.2017.03.041.

(编辑: 吕青远)

· 消 息 ·

致“一带一路”沿线国家和地区医学机构

《中华老年多器官疾病杂志》是由中国工程院院士、老年心脏学专家王士雯教授于2002年创办的全世界唯一一本以老年心脏病和老年心脏病合并其他器官疾病为主要内容的杂志,月刊,由中国人民解放军总医院老年心血管病研究所主办。杂志已被“中国科技论文统计源期刊”(中国科技核心期刊)收录。本杂志的摘要、图表和参考文献,均为中、英文双语对照,方便国外读者顺利阅读。为促进中国与“一带一路”沿线国家和地区的医学及文化交流,本刊将免费刊登其来稿,并赠送当期杂志。欢迎“一带一路”沿线国家和地区的老年心脏病和老年病学医生、学者踊跃投稿。

To medical academic institutions of all countries along the Belt and Road

The Chinese Journal of Multiple Organ Diseases in the Elderly (Zhonghua Laonian Duoqiguan Jibing Zazhi) is founded in 2002 by Shiwen Wang, Member of Chinese Academy of Engineering, a renowned geriatric cardiologist in China. The journal is published monthly by the Institute of Geriatric Cardiology (IGC), Chinese PLA General Hospital in Beijing, China. The journal, the only one in the world currently, focuses on both basic research and clinical practice to the diagnosis and treatment of cardiovascular disease in the aged people, especially those with concomitant disease of other major organ-systems, like the lungs, kidneys, liver, central nervous system, gastrointestinal tract or endocrinology, *etc.* The journal has been listed in the most authoritative Chinese database, the Chinese Scientific and Technical Papers and Citations Database (Chinese Core Sci-Tech Periodical). For convenience of foreign readers, the main parts of the paper, including abstract, tables, figures and references, are expressed in Chinese-English bilingually. To facilitate the cultural and academic communication between China and countries or regions along the Belt and Road, the journal welcomes the manuscripts from these areas. If reviewed qualified, the manuscript would be published without charging, and the authors would receive a complimentary copy of the current issue.

Address: Editorial Office, *Chinese Journal of Multiple Organ Diseases in the Elderly*, 28 Fuxing Road, Haidian District, Beijing 100853, China

Tel/Fax: 86-10-66936756

E-mail: zhlnhgq@mode301.cn

http://www.mode301.cn