

住院患者脓毒症管理的急诊护理实践进展

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摘 要

脓毒症作为急诊科最常见、病情进展最快的急危重症, 也是全球致死率最高的疾病之一, 其核心为感染诱发宿主反应失调导致的危及生命的器官功能障碍。急诊科作为脓毒症早期识别、复苏与分级处置的第一环节, 急诊护理决策十分重要。本文基于最新内科学年鉴(Annals of Internal Medicine, AIM)住院患者脓毒症管理权威综述, 结合拯救脓毒症运动(Surviving Sepsis Campaign, SSC)指南与急诊护理实践, 从急诊护理角度出发将脓毒症急诊识别、监测评估、核心救治、并发症防治及延续性护理等方面进行全方面综述, 为构建标准化、规范化的急诊脓毒症护理体系提供循证学依据。

关键词

脓毒症, 急诊护理, 集束化护理, 延续性护理

Progress in Emergency Nursing Practice for the Management of Hospitalized Patients with Sepsis

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Abstract

Sepsis is one of the most common and rapidly-progressing critical emergencies in the emergency department, as well as a disease with the highest mortality worldwide. Its core pathogenesis is life-threatening organ dysfunction caused by dysregulated host responses to infection. The emergency

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department serves as the frontline for early recognition, resuscitation and stratified management of sepsis, where emergency nursing decision-making plays a vital role. Based on the authoritative review on sepsis management among hospitalized patients published in *Annals of Internal Medicine* (AIM), combined with the Surviving Sepsis Campaign (SSC) guidelines and clinical emergency nursing practice, this paper comprehensively reviews emergency-department-based sepsis care from the perspectives of early identification, monitoring and assessment, core treatment, complication prevention and management, and continuous nursing. It aims to provide evidence-based references for establishing a standardized and normative emergency nursing system for sepsis.

Keywords

Sepsis, Emergency Nursing, Bundle Nursing, Continuous Nursing

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1. 引言

每年超过 5000 万例发病人数以及 20%死亡率的临床统计数据提示脓毒症(sepsis)早已成为全球院内死亡首因[1]。尽管近 30 年其诊疗水平明显提升,但病死率仍居高不下,尤其是合并感染性休克(Septic Shock, SS)的患者病死率高达 30%~40% [2]。急诊科是脓毒症救治的第一环节,如何进行早期识别、快速液体复苏、科学合理给药以及及时分流直接影响患者的救治疗效及远期预后[3]。护理人员在脓毒症救治链中发挥着不可或缺的作用,主要承担病情监测、用药管理、急救配合、安全转运及健康宣教等核心工作[4]。本综述从急诊护理视角为出发点,整合最新临床数据,提炼各临床护理要点,将救治流程标准化,为提升急诊脓毒症护理优质化水平提供参考。

2. 脓毒症急诊识别与护理筛查

传统的脓毒症定义(sepsis-1)为明确存在的感染和不少于 2 个系统性炎症反应综合征(Systemic Inflammatory Response Syndrome, SIRS),这些指标包括体温、心率、呼吸以及白细胞计数等;而最新的定义(sepsis-3)则更加强调宿主对感染反应失调引起的急性器官功能障碍, SIRS 由于缺乏特异性而从定义中删除[5]。目前临床以序贯器官衰竭评分(Sequential Organ Failure Assessment, SOFA)急性增加 ≥ 2 分为脓毒症诊断标准(见表 1) [6]。急诊科更推荐使用快速序贯器官衰竭评分(Quick Sequential Organ Failure Assessment, qSOFA)进行筛查,符合以下 2 项即需要高度重视:呼吸频率 ≥ 22 次/min,意识改变及收缩压 ≤ 100 mmHg [7]。qSOFA 优势在于无需实验室检测因而适合急诊快速分流,但因评估结果主观性较强且敏感性偏低,因此需要联合国家早期预警评分(National Early Warning Score, NEWS)评分与乳酸(Lactic Acid, LA)监测提升其准确性[8]。对于急诊科来说,有些急诊患者早期识别时间应在院前急救中就开始。当然需要警惕的是不能将血压水平作为识别休克的唯一标准,例如对于平时血压高而住院期间下降至正常时该患者可能实际上已经处于休克阶段[9];而识别隐匿性休克(Occult Shock, OS)的关键指标在于 LA,当机体缺血缺氧严重导致有氧代谢不足而需要无氧糖酵解代偿时,就会产生大量 LA,因此其水平显著升高往往提示机体缺血缺氧严重[10];怀疑脓症患者均应尽快监测 LA 水平并动态复查, LA ≥ 4 mmol/L 提示严重低灌注,患者预后变差的同时病死率显著增加[3]。急救护理人员在院前急救和院内急救过程中可通过 qSOFA、NEWS、LA 的联合应用及时发现病情变化,为进一步诊治创造条件,提高急救成功率。护理人员也需要重点关注老年、糖尿病、慢性肾脏疾病、免疫抑制及留置导管等高风险人群,因为此类

患者症状隐匿，常因神志改变、跌倒等首发症状而易漏诊[11]。急诊科应建立脓毒症早期预警护理路径(Sepsis Early Warning Nursing Pathway, SEWN-P) [12]，对感染伴生命体征异常患者需立即进行评估，缩短识别救治时间。

Table 1. Sequential Organ Failure Assessment (SOFA) scoring criteria
表 1. SOFA 评分标准

评估器官系统	0 分	1 分	2 分	3 分	4 分
呼吸系统 (氧合指数, mmHg)	≥400	300~399	200~299	100~199 (需呼吸支持)	<100 (需呼吸支持)
凝血功能 (血小板计数, ×10 ⁹ /L)	≥150	100~149	50~99	20~49	<20
肝脏功能 (总胆红素, mg/dL/μmol/L)	<1.2/<20	1.2~1.9/20~32	2.0~5.9/33~101	6.0~11.9/102~204	≥12.0/≥205
心血管系统 血压及或血管药物	无低血压 MAP < 70 mmHg		多巴胺 ≤ 5 μg/(kg·min) 或任意剂量多巴酚丁胺	多巴胺 > 5 μg/(kg·min)或去甲肾上腺素 ≤ 0.1 μg/(kg·min)或肾上腺素 ≤ 0.1 μg/(kg·min)	多巴胺 > 15 μg/(kg·min)或去甲肾上腺素 > 0.1 μg/(kg·min)或肾上腺素 > 0.1 μg/(kg·min)
神经系统 GCS	15 分	13~14 分	10~12 分	6~9 分	<6 分
肾脏功能 (血清肌酐, mg/dL/μmol/L 或尿量)	<1.2/<106	1.2~1.9/106~168	2.0~3.4/169~300	3.5~4.9/301~439 或尿量 < 500 mL/d	≥5.0/≥440 或 尿量 < 200 mL/d

表注：1. SOFA 评分为六大器官系统分值相加总和；脓毒症定义为可疑或确诊感染基础上，SOFA 评分较基线急性升高 ≥2 分。2. 肾脏维度仅采用血清肌酐绝对值与固定日尿量阈值，未校正基线肾功能、体重及肌肉量，可能存在临床评估偏倚。

3. 急诊脓毒症监测与护理评估

首次评估应当以危险分层与器官功能监测为核心。护理学监测重点应包括：

3.1. 血流动力学

平均动脉压(Mean Arterial Pressure, MAP) [13]、皮肤温度、心室率、毛细血管再充盈时间(Capillary Refill Time, CRT, >3 秒提示灌注不足) [14]。

3.2. 呼吸功能

呼吸频率、血氧饱和度、意识状态等指标改变有助于及时识别急性呼吸窘迫综合征(Acute Respiratory Distress Syndrome, ARDS) [15]。

3.3. 肾功能

每小时尿量 < 0.5 ml/kg/h 并持续 6 小时以上提示急性肾损伤(Acute Kidney Injury, AKI) [16]。

3.4. 实验室指标

LA、血常规、电解质、血糖,尤其是LA需要动态复查以评估复苏效果。当患者无休克风险时血培养应当在抗生素使用之前采集,当需氧菌与厌氧菌需同时采集时,护理操作须严格执行无菌原则,避免污染影响结果。急救护理人员应陪同患者尽量尽早完成影像学检查,如胸部X光、胸部计算机体层成像(Computed Tomography, CT) [17]等检查,这有助于快速定位感染灶,制定治疗方案。

4. 急诊脓毒症救治核心护理实施

4.1. 液体复苏护理

目前观念认为在3小时内完成 ≥ 30 ml/kg 晶体液复苏作为脓毒症合并低灌注或OS患者核心要求[18]。首选乳酸林格氏液或生理盐水而常规不推荐使用白蛋白,因为白蛋白早期使用可能导致脓毒症相关急性肾衰竭(Sepsis-Associated Acute Kidney Injury, SA-AKI)风险增加[19]。患者快速补液的同时护理人员应严格监测生命体征,尤其是对合并慢性心力衰竭等基础疾病患者,补液过快过多导致急性心力衰竭(Acute Heart Failure, AHF)风险增加。被动抬腿实验(Passive Leg Raise Test, PLRT)和毛细血管再充盈时间(Capillary Refill Time, CRT)等操作简单、无创,适合急诊快速判断评估液体反应性[20]。准确记录患者补液开始时间与结束时间,护理记录出入量时需警惕急性肺水肿、AHF等出现,必要时及时通知医生加用利尿剂。所以在急救过程中,急救护理人员通过将生命体征、PLRT、CRT,患者补液时间、患者出入量等重点监测项目专门制定成适合急救过程中快速填写的表格,可以使患者病情变化一目了然,辅助医师通过表格记录的病情变化从而调整治疗方案。

4.2. 抗生素使用护理

抗生素的使用至关重要:感染性休克患者1小时内、无休克高风险患者应3小时内启动抗生素使用[21]。护理人员严格执行时间节点、优先建立畅通静脉通路确保药物准时输注。用药前注意排除患者过敏史。若有配伍禁忌的药物,急救护理人员应建立多条静脉通路,在静脉通路上做好标识,让药物发挥更好的作用。对于定点或者特殊使用的药物可以在治疗单上做好醒目标识,做好交接班,防止患者药物未准时输注。首次经验性用药需尽量覆盖各种致病菌,特殊人群如耐甲氧西林金黄色葡萄球菌(Methicillin-Resistant *Staphylococcus aureus*, MRSA)、多重耐药人群需联合用药并做好院内感染防护、消毒隔离等措施[22] [23];头孢等药物需做好皮肤过敏试验(Skin allergy Test, ST) [24]。用药期间及时观察各种不良反应。急救护理人员应及时参与抗生素降级讨论,因为护理人员可以通过最新讨论会结果在患者治疗过程中及时观察病情及反馈。通过根据培养结果缩窄抗菌谱、减少耐药与二重感染风险,条件情况允许的情况使用降阶梯疗法。

4.3. 感染源控制护理

通常认为需要在确诊后12小时内完成引流、清创、拔出导管等感染源控制环节。护理人员协助评估感染灶:肺部感染患者需关注氧合指数、血氧饱和度及排痰情况,腹腔感染患者需观察是否有腹痛、腹胀及腹膜刺激征[25];导管相关感染需及时拔除非必要导管并及时做好导管尖端送培养[26]。而急救护理人员应针对不同情况的感染制作重点监测项目表格,当监测项目有特殊变化时及时反馈医生进行处理。

4.4. 血管活性药物护理

治疗期间严格监测MAP,经积极液体复苏后其仍小于65 mmHg者需及时启动血管活性药物治疗,首选去甲肾上腺素[2]。短时间使用可经外周静脉输注,护理操作时需保证静脉管道畅通、液体无外渗、

预防坏死风险；长时间或大剂量使用首选中心静脉通路[27]。血管升压素可作为二线药物辅助，减少去甲肾上腺素用量[28]。在用药期间，护理工作应重点持续监测血压，及时向医生上报生命体征并遵医嘱及时准确调节剂量，急救护理人员要告知患者及家属严禁擅自调节用药速度甚至停药的风险，因为护患之间良好有效的沟通才有利于患者病情恢复。

4.5. 糖皮质激素护理

糖皮质激素如氢化可的松有助于难治性感染性休克的逆转，但能否降低总体病死率目前尚有争议[29]。使用期间护理需监测电解质、血糖等，警惕高血糖、肌无力及电解质代谢紊乱出现，严格按剂量与疗程给药，避免突然停药[30]。

5. 并发症预防及综合护理

科学的护理能显著减少脓毒症并发症发生风险并改善预后，其关键在于早期防控：

5.1. 呼吸支持

及时氧疗或机械通气，实施集束化策略，每日镇静唤醒、自主呼吸试验、谵妄筛查与早期活动。

5.2. 肾脏保护

维持肾脏灌注，监测 24 小时尿量与肌酐、肾小球滤过率等指标，警惕肾毒性药物使用。

5.3. 血糖管理

糖尿病患者应尽早胰岛素治疗，当血糖数值 $> 33 \text{ mmol/L}$ 者则需要使用静脉微量泵持续泵入控制血糖，每 1 小时监测末梢血糖并调节剂量，警惕低血糖、糖尿病酮症酸中毒(Diabetic Ketoacidosis, DKA) [31]、糖尿病乳酸酸中毒(Diabetic Lactic Acidosis, DLA) [32]等并发症出现。

5.4. 谵妄与认知护理

通过格拉斯哥昏迷量表(Glasgow Coma Scale, GSC) [33]等进行意识评分，减少约束，维持患者昼夜节律，加强沟通与定向力训练，降低获得性谵妄风险(Associated Delirium, AD) [34]。

6. 脓毒症幸存者护理

出院并不是治疗的终点，出院后的随访、宣教、继续治疗同样关键，这有利于减少再入院率、提升院外生存质量。该类患者往往伴有脓毒症后综合征(Post-Sepsis Syndrome, PSS)，具体表现为认知下降、肌力减退、易疲劳、焦虑抑郁及再感染风险升高等。出院前护理需重点关注用药核对、康复转诊、社会支持治疗、早期复诊、感染复发症状宣教等。院外需加强随访，急救护理人员可以通过与患者或家属描述的情况中整理患者近况，为每一个病人做成随访情况记录本，让记录中的异常情况及时得到反馈及指导，降低再入院与远期死亡风险，促进器官功能康复，提高生存质量，节约公共医疗资源，减轻社会保障负担，提高幸福感。

7. 急诊脓毒症护理流程与质量改进

当前仍以美国医疗保险和医疗补助服务中心(Centers for Medicare & Medicaid Services, CMS)严重脓毒症与感染性休克早期管理集束化方案(Early Management Bundle for Severe Sepsis/Septic Shock, SEP-1)拯救脓毒症运动(Surviving Sepsis Campaign, SSC)脓毒症与感染性休克管理国际指南为全球脓毒症质量改进核心依据[35]-[37]，包括：及时 LA 检测、抗生素使用前血培养、1 小时内抗生素使用、30 ml/kg 液体复

苏、血管活性药物使用及 LA 动态监测[38]。急诊科应当建立脓毒症急救护理小组,规范“分诊-评估-复苏-用药-转运”标准操作流程。重点护理指标包括识别时间、抗生素启动时间、液体复苏率、科间转运时间、7~28 天病死率及再入院率等[39]。为实现跨学科协作,有条件的情况下院内可以成立多学科合作的脓毒症救治团队。目前人工智能化时代已经出现,而机器学习(Machine Learning, ML)及人工智能(Artificial Intelligence, AI)的普及能显著提升护理工作效率,因此呼吁加强培训护理人员对新型工具的使用与掌握[40][41],将护理指标数据化,比如患者在整个治疗过程中的数据变化可以通过 AI 生成曲线图,鱼骨图等方式提高工作效率,以免错过急救黄金时间。医院可以利用人工智能建立脓毒症系统,对所有考虑脓毒症血症的急症或高危住院病人进行常规筛查,提前进行预警提示。通过监测患者整体治疗过程的数据进行反馈及优化,提升系统准确率,降低死亡率。

8. 总结与展望

作为脓毒症诊疗的第一道防线,急诊护理以“早期识别、尽快复苏、准确用药、严格监测、优化衔接”为工作核心。进一步优化急诊脓毒症护理预警模型,推广标准化集束化护理路径,强化专科护理技能培训,纳入延续性护理工作,以全流程、多维度护理策略持续改善脓毒症患者生存质量,降低死亡率。

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