抗突发性传染病的新疆特色药材及制剂研究进展与展望

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摘要: 突发性呼吸道传染病传播迅速、防控难度大, 已成为全球公共卫生的重要挑战。新疆地区民族医药资源丰富, 维药、哈药等传统药材在抗病毒、抗炎、抗菌及免疫调节方面展现出独特潜力。本文综述了阿里红、神香草、一枝蒿、琐琐葡萄等新疆特色药材和临床常用制剂的化学成分、药理作用及其在呼吸道传染病防治中的应用现状。过往研究发现民族药材与制剂具有多成分、多靶点、多通路的协同作用机制, 可抑制病毒复制、调节免疫应答、减轻炎症损伤, 已在临床实践中展现出良好的疗效与安全性。本文基于新疆民族药现代化开发、制剂优化、临床验证等发展维度面临的挑战, 以期为应对未来突发性呼吸道传染病提供新的药物资源与防治策略。

关键词: 新疆民族药; 突发性呼吸道传染病; 抗病毒; 抗炎; 抗菌; 免疫调节

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Research progress and prospects of Xinjiang-specific medicinal materials and preparations in the prevention and treatment of emerging infectious diseases

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Abstract: Sudden respiratory infectious diseases spread rapidly and pose significant challenges for prevention and control, representing a major public health concern globally. Xinjiang is rich in ethnic medical resources, with traditional medicinal materials such as Uyghur and Kazakh herbs demonstrating unique potential in antiviral, anti-inflammatory, antimicrobial, and immunomodulatory effects. This article reviews the chemical components, pharmacological effects and applications in respiratory infectious diseases of characteristic Xinjiang medicinal materials such as *Fomes officinalis*, *Hyssopus officinalis*, and *Artemisia rupestris*, as well as commonly used clinical preparations. Studies have found that ethnic medicinal materials and preparations exhibit synergistic mechanisms

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involving multiple components, targets, and pathways, which inhibit viral replication, modulate immune responses and mitigate inflammatory damage. They have demonstrated favorable efficacy and safety in clinical practice. This review further discusses the challenges faced in modernization, formulation optimization, and clinical validation of Xinjiang ethnic medicines, aiming to provide new medicinal resources and prevention strategies for addressing sudden respiratory infectious diseases.

Key words: Xinjiang ethnic medicine; sudden respiratory infectious disease; antiviral; anti-inflammatory; antimicrobial; immune regulation

突发性传染病是指在短时间内突然发生, 重症和死亡比例高, 早期识别困难, 缺乏特异和有效的防治手段, 易导致大规模暴发流行、构成突发公共卫生事件, 造成或可能造成严重的社会、经济和政治影响, 须采取紧急措施应对的传染病[1]。在所有突发性传染病中, 呼吸道传染病因其主要通过空气飞沫或气溶胶传播, 涉及流感、新型冠状病毒肺炎、腮腺炎、麻疹等常见病原, 成为最易导致大规模群体感染的类别[2]。

呼吸道传染病的发生发展是一个多阶段、动态演进的过程。感染初期, 病原体侵入呼吸道黏膜上皮细胞并大量复制; 随后, 机体免疫系统被激活以清除病原体, 部分重症患者因免疫反应失衡, 导致促炎因子 (如TNF-α、IL-6等) 过度释放, 引发“细胞因子风暴”, 造成急性肺损伤甚至多器官衰竭[3]。与此同时, 氧化应激反应加剧, 进一步加重肺组织损伤。基于此, 理想的治疗策略应具备“多维干预”特点: 在感染初期抑制病原体; 免疫病理阶段调控炎症反应; 同时通过免疫调节恢复稳态并促进组织修复。

然而, 当前临床常用的抗呼吸道感染药物仍存在明显局限。以奥司他韦、利巴韦林为代表的抗病毒药, 以及各类抗生素, 虽作用机制明确、起效迅速, 但多局限于单一靶点, 难以同时应对病毒感染、炎症风暴、免疫紊乱等多重病理改变; 且长期使用易导致耐药性产生与不良反应发生[4]。因此, 亟需探索兼具抗病毒、抗炎与免疫调节的多靶点治疗方案, 以弥补单一靶点化学药物的不足[5]。

新疆作为多民族聚居地区, 维吾尔药、哈萨克药、蒙药等民族医药体系在长期实践中形成了各具特色的用药经验[6]。维吾尔医药强调“体液平衡”与“药性协同”, 善用复方配伍以调节机体整体状态; 哈萨克医药依托“六元学说”, 多用芳香挥发类药材驱邪外出; 蒙古医药以“寒热对立”为核心, 偏于温燥散寒, 擅长调理寒性呼吸道病症。三大民族医药理论体系虽各成体系, 但在抗感染用药上高度契合: 均偏好富含挥发油、黄酮、多糖类成分的药材, 通过整体调节实现治疗目的。新疆道地药材如一枝蒿、神香草、阿里红等, 其含有的活性成分可通过“多成分—多靶点—多通路”的协同模式, 精准适配呼吸道传染病“病毒感染—炎症激活—免疫紊乱”的复杂病理进程, 展现出化学药物难以比拟的整体调节与综合防治优势[7]。因此, 深入挖掘与开发新疆民族药材, 有望为应对新发突发传染病提供新的防治策略与药物来源。本文系统梳理了具有抗炎、抗病毒、抗菌、免疫调节潜力的代表性新疆特色药材及其制剂, 旨在为新疆民族药的研究和开发利用提供科学参考依据。

1 抗突发性传染病的特色民族药材

新疆拥有得天独厚的自然环境和悠久的民族医药传统, 使得本地区的特色药材资源异常丰富。据统计, 已确认具有药用价值的药材超过2 200余种, 其中国家药典及地方标准累计收载维吾尔药材283种, 涵盖肉苁蓉、一枝蒿等多种特有野生药材[8]。这些药材在维吾尔、哈萨克等民族医药体系中长期用于突发性传染病的防治, 形成了独具特色的用药经验。新疆地区抗呼吸道传染病的特色民族药材及其核心信息汇总见表1[9-59]。本文选取阿里红、神香草、一枝蒿、琐琐葡萄四种药材进行重点阐述, 主要基于三方面考量: 一是其抗病毒、抗炎及免疫调节的现代药理研究相对深入; 二是作为寒喘祖帕颗粒、复方一枝蒿等核心制剂的君药或臣药, 临床转化价值突出; 三是均为新疆道地药材, 能充分体现区域资源特色。通过表列形式归类, 可弥补正文详述范围的局限, 又能为后续药物研发提供更全面的资源清单。

为全面展现资源全貌, 本文同时将大青叶、唇香草、新疆阿魏等8种临床常用的特色药材纳入表1汇总梳理。这些药材虽现代机制研究深度不及前述4种, 但均为民族医药治疗呼吸道感染的经典用药, 核心活性成分明确、各具药用价值: 大青叶抗菌抗炎、唇香草止咳祛痰、新疆阿魏抑菌调节免疫, 苦豆子、天山堇菜等亦能通过各自核心活性成分发挥抗炎、抗病毒功效, 且均已应用于相关制剂, 在民族医药防治突发性传染病中发挥着辅助且重要的作用, 共同构成新疆抗突发传染病的特色药材体系。

1.1 阿里红 阿里红为多孔菌科药用层孔菌的干燥子实体, 主要分布于新疆的阿尔泰林区和天山高寒草

Table 1 Xinjiang characteristic ethnic medicinal materials for emerging infectious diseases. 1: Antiviral activity; 2: Immunomodulatory activity; 3: Antibacterial activity; 4: Antioxidant activity; 5: Anti-inflammatory activity; 6: Antitussive and expectorant activity; 7: Anti-asthmatic activity; 8: Bronchial spaamolysis activity

Herb	Botanical origin	Medicinal part	Main active ingredient	Pharmacological activity	Marketed preparations/Hospital preparation	Ref.
Artemisia rupetris L.	Asteraceae	Whole herb	Rupestonic acid; water-extract; polysaccharide; quercetin; kaempferol; *β*-myrcene; 1,8-cineole	1, 2, 3, 4	Compound Yizhihao granules; Compound Yizhihao oral liquid	[9-15]
Isatis indigotica Fortune	Brassicaceae	Dried leaf	Indirubin; indigo; tryptanthrin	1, 2, 3, 4, 5	Compound Daqingye; injection; compound Daqingye mixture	[16-20]
Ziziphora clinopodioides Lam.	Lamiaceae	Whole herb	Menthone; menthol; thymol; piperidone; quercetin; rosmarinic acid	3, 6, 5	Compound Ziziphora cough syrup; Ziziphora lung-clearing granules; Compound Ziziphora capsules	[21-24]
Ferula sinkiangensis K. M. Shen	Apiaceae	Resin	Sulfur-containing volatile oils; ferula polysaccharides; sesquiterpene coumarins; ferulic acid and phenolic acids; flavonoids	1, 2, 3, 5	Awei cough syrup; Compound Awei antiasthmatic granules; Awei lung-moistening capsules	[25-29]
Sophora alopecuroides L.	Fabaceae	Whole herb, seed	Matrine; oxymatrine; sophoridine; flavonoids; sophora alopecuroides polysaccharides	3, 5	Kudouzi cough syrup; Compound Kudouzi lung-clearing granules	[30-32]
Hyssopus cuspidatus Boriss.	Lamiaceae	Whole herb	Luteolin; hyperoside; pinocamphone/isopinocamphone; 1,8-cineole; rosmarinic acid; caffeic acid; terpenoids	3, 4, 6, 7	Hanchuan Zupa granules; Hyssop cough syrup	[33-40]
Vitis vinifera L.	Vitaceae	Fruit	Oleanoic acid; isoquercitrin; quercetin-3-*O*-*β*-*D*-glucuronide sodium; gallic acid; caftaric acid; vitis amurensis polysaccharides	1, 2, 3	Jiegeng Bawei granules	[41-43]
Nigella glandulifera Maxim.	Ranunculaceae	Dried ripe seed	Thymoquinone; flavonoids and phenolic acids; alkaloids; polysaccharides	2, 4, 5, 6, 8	–	[44-47]
Viola tianshanica Maxim.	Violaceae	Whole herb	Flavonoids (quercetin, rutin); essential oils; cyclopeptides; coumarins; ethanol extract	1, 2, 3, 4, 5, 6	Compound Binax granules; Tianshan violet cough syrup	[48-52]
Brassica rapa L.	Brassicaceae	Root tuber	Turnip acidic polysaccharides; flavonoids and phenolic acids; glucosinolates	2, 4, 5	Qiamagu lung-moistening syrup; Compound Qiamagu lung-clearing granules	[53-55]
Foeniculum vulgare Mill.	Apiaceae	Ripe fruit	Essential oils (*trans*-anethole, estragole, fenchone, limonene); flavonoids and phenolic acids	3, 4, 5	Hanchuan Zupa granules; Compound fennel cough syrup	[56,57]
Fomes officinalis Bres.	Polyporaceae	Fruiting body	Triterpene acids (eburicoic acid, dehydroeburicoic acid); polysaccharides; flavonoids and phenolic acids	1, 2, 4, 5, 6	Ali Hong antitussive and antiasthmatic oral liquid; Ali Hong lung-moistening tablets	[58,59]

甸, 是新疆重要的道地药材之一[60]。在维吾尔医药中, 其性温、味甘苦, 归肺、脾经, 常用于寒性咳嗽、支气管炎、哮喘等呼吸道疾病的治疗。其主要活性成分包括多糖、三萜酸 (齿孔酸、去氢齿孔酸等)、甾体、皂苷和挥发油等, 其中三萜酸类含量最高[61]。

现代药理研究发现, 阿里红的药效发挥依赖于多成分协同作用体系。其水提物能够抑制平滑肌收缩, 表现出平滑肌松弛和止咳平喘的作用。其中的三萜酸类化合物显示显著的抗炎和抗氧化活性, 能够抑制炎症介质的释放, 是阿里红抗炎的关键物质[62]。体外抗病毒研究表明, 阿里红提取物对流感病毒和部分呼吸道合胞病毒具有抑制作用; 阿里红的乙酸乙酯和正丁醇提取物则对金黄色葡萄球菌、假结核耶尔森菌、结核分枝杆菌等多种致病菌均表现出显著抑菌活性[63]。

进一步的机制研究发现, 阿里红各活性成分在病毒感染与炎症反应的不同阶段呈现时序性调控特征, 多糖、三萜酸、挥发油及黄酮类成分共同构成早期阻断–中期激活–晚期修复的完整防御链条。挥发油与黄酮类成分作用于病毒侵入阶段, 通过干扰血凝素受体结合抑制病毒吸附与复制, 实现早期感染阻断; 阿里

红多糖作为核心免疫调节物质, 在病毒入侵初期快速启动先天免疫应答, 激活巨噬细胞与B细胞, 调节Th1/Th2细胞平衡, 维持免疫稳态; 三萜酸类成分则在感染后期发挥主导抗炎作用, 通过调控NF-κB信号通路抑制炎症介质释放, 减轻免疫病理损伤, 促进组织修复与免疫平衡重建[64]。

1.2 硬尖神香草 硬尖神香草为唇形科植物硬尖神香草的干燥全草, 系维吾尔族民间习用药材, 俗称“祖帕奇尼”。其药性干热, 具有止咳化痰、平喘利肺之功效, 单味或入复方用于湿寒质性和黏液质性呼吸器官疾病的治疗[65]。其成分复杂, 富含挥发油、黄酮、甾类、萜类、苯丙素类等多种活性成分, 这些成分构成其药理活性的物质基础[66]。

硬尖神香草可通过抑制病毒、调节免疫失衡、减轻炎症反应、抗氧化等多靶点机制发挥治疗作用。不同极性的神香草提取物能够显著抑制LPS诱导的小鼠单核巨噬细胞 (RAW264.7) 炎症模型中的NO、TNF-α和白细胞介素6 (IL-6) 的产生, 发挥抗炎作用[67]。体外实验进一步证实, 硬尖神香草提取物能够抑制流感病毒、乙型肝炎病毒、单纯疱疹病毒, 推测其多酚、萜类成分通过干扰病毒吸附或复制过程发挥抗病毒作用[68]。在抗菌方面, 神香草挥发油对多种念珠菌 (包括白色念珠菌、光滑念珠菌、热带念珠菌、近平滑念球菌及克鲁斯氏念球菌) 均表现出抑菌活性, 且对氟康唑耐药白色念珠菌亦有效, 推测其抗菌机制不同于传统唑类药物, 可能通过增加细胞膜通透性并抑制膜ATP酶活性实现细胞死亡[39]。

硬尖神香草的多糖是其免疫活性的核心成分。神香草的水提多糖能够显著促进单核/巨噬细胞的增殖和吞噬活性, 并诱导适度分泌IL-6、TNF-α等细胞因子, 提示其通过TLR2/TLR4-MyD88-NF-κB信号通路激活先天免疫[69]。

1.3 一枝蒿 一枝蒿又称新疆一枝蒿或岩蒿, 为菊科蒿属植物, 以全草入药, 是新疆地区独有特色民族药, 野生资源主要分布于天山、阿尔泰山等海拔1 600至3 000米的区域, 哈萨克斯坦、蒙古等地区亦有分布[70,71]。其民间应用历史悠久, 现收录于多部维吾尔药权威标准中。现代研究表明, 一枝蒿具有清热解毒、抗过敏、抗病毒及免疫调节等多种药理活性, 在病毒性感冒、支气管炎等呼吸系统疾病的防治中应用广泛, 素有“家有一枝蒿, 百病都除掉”的民间谚语[71]。

一枝蒿化学成分丰富, 目前已分离出黄酮、倍半萜、挥发油、生物碱、有机酸、氨基酸、多糖等多种成分[72]。网络药理学与体外实验均表明, 一枝蒿乙醇提取物能够抑制乙型肝炎病毒DNA复制, 并对流感病毒A、呼吸道合胞病毒、单纯疱疹病毒等呼吸道病毒显示显著抑制作用[73]。Fang等[74]研究发现, 一枝蒿水提物和醇提物具有广谱的抗菌作用, 无水乙醇提取物的抗菌效果最好, 且新疆一枝蒿提取物对革兰阳性菌的抑菌效果优于革兰阴性菌。

一枝蒿还具有良好的抗炎、免疫调节作用。Oh等[75]以巨噬细胞RAW264.7为研究对象, 考察一枝蒿不同极性提取物对细胞上清液中炎症因子的影响。研究发现, 不同极性的提取物 (水提、乙醇提、醋酸乙酯提) 均能显著抑制LPS刺激的RAW264.7巨噬细胞产生的NO、TNF-α、IL-6等促炎因子, 推测其通过抑制NF-κB/MAPK信号通路实现抗炎, 从而减轻呼吸道炎症损伤。进一步体外试验揭示, 一枝蒿水提多糖通过TLR2/TLR4-MyD88-NF-κB/MAPK信号轴激活先天免疫细胞, 进而促进树突细胞成熟、T细胞增殖及Th1/Th2细胞因子平衡的调节, 形成“激活−抑制−平衡”的完整免疫调节网络, 为其在突发性呼吸道传染病中的防治奠定了坚实的分子药理学基础[76]。

1.4 琐琐葡萄 琐琐葡萄, 亦称“温恰玉租木”, 是新疆特有的药食兼用无核红葡萄品系, 果粒细小, 色泽深紫, 我国主产于新疆吐鲁番、和田、鄯善等地, 是《神农本草经》《维吾尔药志》中记载的葡萄品种之一。药用部位为干燥果实, 具有健脾胃、理肺、生津、养血等功能, 常用于脾胃不和、发热及呼吸道炎症、急性肺炎、咽喉炎等呼吸道感染性疾病的治疗[77]。

现代研究表明, 琐琐葡萄中富含葡萄糖、果糖、维生素、氨基酸等营养成分外, 同时含有鞣质、黄酮、萜类、多糖等多种生物活性物质[77]。He等[78]在MDCK细胞模型中分别评估了琐琐葡萄总黄酮、总三萜和总多糖的抗流感病毒活性, 结果显示, 总黄酮和总多糖在预处理、直接作用和感染后处理三种模式下均能显著降低病毒的细胞病变率, 保护率随浓度升高而提升。总三萜 (主要为齐墩果酸) 在治疗组的抑制效果优于黄酮和多糖, 且与利巴韦林的疗效相当。推测总黄酮中的槲皮素、山柰酚等活性成分能够抑制病毒神经氨酸酶活性, 阻碍病毒从宿主细胞中的释放与扩散, 同时通过干扰病毒包膜与细胞膜的融合过程, 阻断病毒的入侵途径, 从而发挥直接的抗病毒作用; 而齐墩果酸可能通过调节NF-κB信号通路, 抑制炎症介质 (如TNF-α、IL-6等) 的过度释放, 减轻病毒诱导的免疫病理损伤, 尤其在感染后期对缓解炎症风暴尤为关键。Yu[79]发现琐琐葡萄总黄酮和多糖均可显著改善免疫低下模型小鼠的体液免疫功能和细胞免疫功能, 显示出显著且稳定的免疫增强作用。抗菌实验亦表明, 琐琐葡萄乙酸乙酯和正丁醇提取物对金黄色葡萄球菌、大肠杆菌、

枯草杆菌等常见致病菌有抑制作用[80]。

综上, 琐琐葡萄的药理机制并非单一成分起效, 而是以黄酮、多糖和三萜类为核心构成的功能互补网络: 黄酮直接抑制病毒, 多糖激活机体免疫, 三萜调控炎症反应。三者通过“直接抗病毒—免疫激活—炎症调控”通路协同作用, 构建一个多靶点、多层次的整合调控系统, 使其在突发性传染病防治及免疫功能提升等领域展现出广阔的开发前景。

2 抗突发性传染病的特色制剂

在新疆民族医药体系中, 抗突发性呼吸道传染病的治疗已不局限于单味药材的直接使用, 而是以“辨证施治、药性协同”为核心, 研发出一批具有显著优势的复方制剂。这类制剂通过多药材、多活性成分、多靶点的协同作用, 能够在抗病毒、抗炎及免疫调节方面实现综合疗效, 往往优于单味药的单一作用, 充分体现了民族医药的整体观念与智慧。随着现代药学技术的进步, 许多经典验方已成功转化为颗粒剂、胶囊剂等现代剂型, 并纳入《国家药品标准》, 实现了从经验用药向标准化、产业化药物的跨越, 为突发性呼吸道传染病的防控提供了可靠的药学支撑。本节将重点介绍几种在应对突发性呼吸道传染病中表现出明确潜力且应用广泛的维吾尔药特色制剂, 阐述其配伍原理、药理机制及临床应用现状。

2.1 寒喘祖帕颗粒 维吾尔医学认为, 痰、瘀、寒为肺部异常体液, 由外感寒邪、劳倦、情志与饮食失调引发, 久则形成瘀血, 导致咳嗽喘逆, 治疗以温肺化痰、平喘止咳、清除异常体液为原则[81]。寒喘祖帕颗粒是新疆经典维药复方, 源自《卡日巴丁卡德尔》古籍, 配方包括小茴香、芹菜子、神香草、玫瑰花、芸香草、荨麻子、铁线蕨、葫芦巴及甘草浸膏等9味药材, 有温肺止喘、燥湿化痰、祛寒止咳之功, 已获国药准字号并广泛用于急性感冒、寒性咳嗽及异常黏液性哮喘等呼吸系统疾病[82]。

现代药理学研究表明, 该方多成分、多靶点协同起效: 神香草甲醇提取物能够抑制炎症介质释放, 减轻免疫细胞浸润, 显示出强效的抗炎作用[83]。铁线蕨、葫芦巴兼具抗炎、抗菌、抗病毒活性, 可抑制支气管平滑肌收缩、降低肺组织炎症并改善黏液分泌[84]。甘草中的甘草酸及多糖等成分可调控炎症反应, 抑制NF-κB、MAPK等信号通路, 显著降低TNF-α、IL-6等细胞因子水平, 发挥抗炎、免疫调节作用[85]。小茴香挥发油扩张肺部血管、改善局部微循环, 进一步提升药效[86]。玫瑰花总黄酮则下调促炎因子表达, 抑制过度的炎症反应[87]。

多项对照临床试验进一步证实了寒喘祖帕颗粒的疗效与安全性。Huang等[88]研究将寒喘祖帕颗粒联合班布特罗用于咳嗽变异性哮喘的治疗, 结果表明, 联合用药更能显著地改善哮喘症状, 缩短缓解时间, 推测其机制可能与改善肺功能, 抑制气道炎症反应及提升机体免疫功能有关。Qi等[89]将寒喘祖帕用于小儿支气管肺炎的治疗, 发现复方药物协同增效, 促进恢复。此外, 实验模型研究表明, 寒喘祖帕颗粒对甲型流感病毒H1N1/PR8株感染模型亦具有显著保护效应, 其可延长感染宿主生存时间、降低死亡率, 并有效下调小鼠肺组织中IL-6、IL-10、TNF-α、干扰素-γ (IFN-γ) 等细胞因子水平, 降低肺指数, 改善肺实变、炎症病变、支气管病变, 其治疗机制涉及抑制细胞因子释放、调节炎症级联反应。

综上, 寒喘祖帕颗粒凭借其独特的民族药配伍、明确的多靶点药理机制及多项随机对照临床试验所证实的高有效率和良好安全性, 已成为新疆特色抗突发性传染病 (尤其是寒性呼吸道感染) 防治体系中的关键制剂, 为临床提供了温肺化痰、平喘止咳的可靠治疗方案。

2.2 祖卡木颗粒 祖卡木颗粒是新疆维吾尔医药体系中用于防治感冒、支气管炎及哮喘等急性呼吸道疾病的特色制剂, 首见于维吾尔族药学典籍《卡日巴丁卡德尔》, 迄今有1 500多年的历史[90]。1994年, “祖卡木颗粒”作为首批获批的现代维药, 率先实现产业化, 标志着传统维医方剂向现代制剂的转化; 2015年在新疆地区的销售总额突破亿元; 2016年入选维药大品种制剂, 2018年进一步列入全国中药大品种, 同时被纳入《国家基本药物目录》及急救药品目录, 显示出广泛的临床认可度。目前该制剂已发展为颗粒与胶囊两种常用剂型, 全国6家生产企业各持有1个批准文号, 形成了较为完整的产业链[91]。

祖卡木颗粒处方由山柰、罂粟壳、洋甘菊、大枣、薄荷、甘草、蜀葵子、睡莲花、大黄、破布木果等10味药材组成, 体现了维医“辨证施治、药性协同”的组方思想。方中薄荷、睡莲花为君药主疏散风热, 罂粟壳、破布木果、洋甘菊为臣药协同止咳平喘, 大黄、蜀葵子相须以增强清热泻火之效, 大枣、山柰相须养护脾胃, 甘草调和诸药为使[90]。网络药理学和分子对接研究揭示, 方剂中约含139种活性成分 (如木犀草素、槲皮素、山柰酚等), 共作用于66个潜在靶点, 涉及炎症、免疫、病毒复制及气道平滑肌收缩等关键通路, 构建了“多成分–多靶点–多通路”协同网络, 为其抗感冒、抗支气管炎、平喘及抗病毒提供了理论依据[92]。

多项临床研究及Meta分析已证实其疗效确切、安全性良好。一项系统检索国内外数据库并纳入5项临床随机对照研究、共332例上呼吸道感染患者的Meta

分析结果显示, 祖卡木颗粒治疗小儿上呼吸道感染的疗效与对照中成药相近, 且无明显不良反应, 服用便捷[93]。在单项临床对照研究中, 选取136例急性上呼吸道感染患儿开展随机对照观察, 治疗组给予祖卡木颗粒, 对照组给予复方一枝蒿颗粒, 连续治疗5天后, 治疗组总有效率为87.1%, 显著高于对照组的76.79%, 且治疗期间未见明显不良反应, 起效迅速、服用方便[94]。另取100例急性上呼吸道感染患者进行对照研究, 对照组单用利巴韦林, 联合组采用利巴韦林联合祖卡木颗粒治疗, 结果显示联合组临床症状改善时间更短, 实验室指标改善更显著, 总有效率显著高于对照组, 表明祖卡木颗粒与利巴韦林联用可进一步提升临床治疗效果。此外, 针对急性咽炎、急性支气管炎的临床观察亦表明, 祖卡木颗粒对咽喉不适、气道炎症等症状缓解效果显著, 且不良反应轻微, 整体安全性良好[95]。

2.3 复方一枝蒿 复方一枝蒿由一枝蒿、板蓝根和大青叶配伍而成。其中, 一枝蒿为新疆本土特有的维吾尔族常用药材, 具有显著的抗氧化、抗菌及抗病毒活性, 临床上常用于缓解感冒、胃痛、腹胀及荨麻疹等症状; 板蓝根则以清热解毒、凉血为主, 广泛用于流行性感冒、温毒发斑、肝炎、麻疹等疾病的治疗; 大青叶具备清热解毒、凉血消斑的功效, 常用于病毒性流感、肝炎等感染性疾病; 该复方通过三药的协同作用, 形成了抗炎、抗菌、抗病毒及提升机体免疫功能的复合效应[96]。

体内外抑菌实验显示, 复方一枝蒿片在体外能够显著抑制和杀灭金黄色葡萄球菌和肺炎链球菌, 同时对乙型溶血性链球菌有抑制和杀灭作用; 在动物实验中, 其能够显著降低变形杆菌感染小鼠的死亡率, 但对大肠杆菌感染小鼠的死亡率未见显著改善, 推测该复方可能对革兰阳性菌具有较强的抑菌效应, 而对部分革兰阴性菌的活性相对有限[97]。抗病毒机制方面, Obul等[98]研究发现, 复方一枝蒿颗粒可通过激活Nrf2/HO-1信号通路上调血红素氧合酶-1表达, 抑制活性氧生成, 从而抑制甲型流感病毒复制, 且药物浓度与抗病毒作用呈量效关系, 且对多种流感病毒包括耐药株具有广谱抑制活性, 揭示了其在流感病毒治疗中的潜在价值。

临床研究表明, 复方一枝蒿在小儿流行性腮腺炎、感冒及甲型流感等呼吸道感染性疾病中均展现出良好的应用前景。在小儿流行性腮腺炎治疗中, 于常规抗感染基础上加用复方一枝蒿颗粒可显著提升疗效, 治疗组总有效率达91.1%, 显著高于对照组70.5%, 差异具有统计学意义 ($P < 0.05$)[99]。为该药的临床精准应用提供了参考依据。在甲型流感治疗方面, 磷酸奥司他韦联合复方一枝蒿颗粒较单药治疗更具优势: 联合用药组患者的感染指标下降更为显著, 治疗周期明显缩短, 可有效加快病情转归、缩短病程, 显示出良好的协同增效作用[100]。该结果表明, 复方一枝蒿颗粒可通过免疫调节与抗炎作用弥补抗生素仅能杀菌的局限性, 二者联用实现了“祛邪 + 扶正”的协同效应。

3 新疆民族药的多成分协同作用机制解析

前述研究表明, 新疆民族药在防治突发性呼吸道传染病方面优势突出, 其核心作用模式并非单一成分、单一靶点的线性作用, 而是依托天然化学多样性, 构建多成分、多靶点、多通路的网络化协同调控体系, 实现对感染、炎症、免疫损伤等病理环节的全病程干预[6]。

单味新疆民族药本身就是天然的“多靶点药物组合体”, 其所含萜类、黄酮类、多糖、酚酸类等活性成分可分别靶向病毒入侵、复制、释放全过程的关键蛋白、宿主细胞受体及免疫调控核心分子, 实现分层、分时、分靶点的精准干预。病毒感染早期, 黄酮类、萜类成分可直接靶向3CL蛋白酶、PLpro蛋白酶、S蛋白-ACE2结合位点等病毒关键靶点, 阻断病毒吸附、侵入与复制过程, 同时抑制呼吸道常见致病菌的细胞壁合成、生物膜形成及毒力因子表达[14]。多糖类成分则主要靶向TLR4、NF-κB上游信号节点、巨噬细胞表面模式识别受体, 激活先天免疫应答、调节Th1/Th2细胞亚群平衡、促进抗炎因子分泌, 避免免疫过激与“细胞因子风暴”的发生[14]。三萜酸、酚酸类成分则进一步靶向NF-κB、MAPK、JAK-STAT等核心炎症通路, 抑制IL-6、TNF-α、IL-1β等促炎因子的转录与释放, 同时激活Nrf2/HO-1抗氧化通路, 清除氧自由基、减轻氧化应激损伤, 在感染后期保护肺组织细胞功能[33]。单味药内部各类成分作用靶点明确、通路互补, 呈现出高度有序的内源性协同特征。

新疆民族药复方制剂的药效是多药味基于药性、成分与靶点的系统性协同, 而非简单的成分叠加, 在传统配伍理论指导下, 组方整体以正向协同为主, 无明显拮抗与不良反应增强[92]。相较于现有临床常用抗病毒药物 (如利巴韦林、奥司他韦), 新疆民族药材及制剂具有显著独特优势: 临床常用化学药物多针对单一病毒靶点发挥作用, 易产生耐药性, 且长期使用易引发肝肾功能损伤、胃肠道不适等不良反应, 仅能针对性阻断病毒复制环节; 而新疆民族药材 (如阿里红、一枝蒿) 及制剂 (如复方一枝蒿颗粒、寒喘祖帕颗粒), 依托多成分协同效应, 可同时覆盖病毒抑制、炎症调控、免疫平衡、氧化损伤修复等多重病理环节, 不仅能有效抑制呼吸道病毒及致病菌, 还能保护肺组织功能、调节机体免疫稳态, 不良反应发生率极低, 且不易产生耐药性, 尤其适用于突发性呼吸道传染病的全程防治, 同时契合“治

病求本、标本兼顾”的诊疗理念, 填补了单一靶点化学药物在复杂病理状态下的应用局限。

同时, 新疆各民族医药 (以维吾尔医药和哈萨克医药为代表) 在抗突发传染病领域中, 既有共性特点, 也存在明显差异。从共性来看, 两者均以新疆道地药材为物质基础, 秉持“整体观”的诊疗理念, 强调多成分、多靶点的协同调控, 核心作用集中在抗病毒、抗炎和免疫调节三大方向。在用药经验上, 二者也因应新疆干旱气候所导致的呼吸道疾病特点——如易出现干燥症状和病程迁延——形成了具有地域适应性的用药规律, 常用药材中普遍含有黄酮类、多糖类、萜类等活性成分。

在差异方面, 维医维药更注重“药性调和”, 常选用干热性药材, 如硬尖神香草、新疆阿魏, 主要用于缓解由湿寒质性呼吸道感染引发的咳嗽、痰多、气喘等症状。其制剂多遵循“君、臣、佐、使”的配伍理论: 君药主攻病原体抑制与核心炎症通路的调控, 臣药强化免疫调节与组织保护, 佐使药则负责促进有效成分吸收、改善生物利用度, 并调和各药偏性、降低潜在刺激。这种配伍方式能够针对病毒感染、炎症放大、免疫紊乱、氧化损伤、气道黏液高分泌等多个病理环节进行综合干预, 实现对复杂症状的整体调控。此外, 在药代动力学层面, 部分成分还能通过调节代谢酶和膜转运过程, 提高君药有效成分的血药浓度和作用时长, 增强整体协同效应。相比之下, 哈医哈药则更侧重“扶正祛邪”, 常用一枝蒿、天山堇菜等兼具清热解毒与免疫增强作用的药材, 注重改善机体先天免疫功能, 减少感染复发。制剂多以单味药或简单复方为主, 更加重视原生成分的保留与临床实用性。二者在理念与方法上形成互补, 共同丰富了新疆民族医药在抗突发传染病领域的用药体系。

综上所述, 新疆民族药制剂通过多药味、多成分的高效协同, 弥补了单靶点药物作用单一、易产生耐药性及免疫损伤风险高等不足, 实现了疗效与安全性的双重提升, 充分体现了民族医药“整体观”与系统调控的科学内涵。

4 总结与展望

本文系统综述了阿里红、神香草、一枝蒿、琐琐葡萄等新疆特色药材, 以及寒喘祖帕颗粒、祖卡木颗粒和复方一枝蒿等经典制剂在抗突发性呼吸道传染病方面的研究进展。综合分析表明, 新疆民族医药在此领域展现出独特的价值和巨大的潜力, 优势特点主要体现在三方面: 一是资源独特, 活性明确, 新疆特色药材富含多糖、黄酮、萜类等天然活性成分, 其抗病毒、抗炎和免疫调节作用均被证实。例如, 阿里红、一枝蒿、神香草等所含关键成分为药效发挥提供了重要物质基础; 二是多靶点协同作用, 单味药材与复方制剂, 均非单一通路起效, 通过直接抑制病毒复制、调控炎症信号通路、激活先天免疫、调节细胞因子平衡等多途径, 构建了“抗病原体–宿主免疫调节”的协同干预网络, 与呼吸道传染病复杂的病理过程高度契合; 三是制剂现代化与临床验证成效显著, 经典复方已成功转化为现代制剂, 并纳入国家药品标准与目录。多项临床试验与公共卫生实践验证了其有效性和安全性, 为传统医学向循证医学转化奠定了基础。

然而, 该领域的研究与开发仍面临诸多挑战, 未来的发展应聚焦于以下几个关键方向: 一是深化药效物质基础与作用机制研究, 运用代谢组学、网络药理学等技术, 精准鉴定关键药效分子群, 系统阐明多靶点网络化协同机制; 二是创新制剂技术与产品开发, 引入纳米技术、靶向递送等策略, 研发成分清晰、作用精准的现代创新药, 推动剂型向现代化、智能化升级; 三是加强质量控制与产业升级, 建立药材至成品全链条精准质控体系, 依托智能制造保障药品质量均一、稳定、可追溯, 支撑产业高质量发展。

综上, 新疆民族药是抗突发性呼吸道传染病的天然药物资源库, 其现代化开发与临床转化, 有望为全球公共卫生防控体系提供极具特色的中国方案。

作者贡献: 古丽米热•阿卜杜克热木、孙亚男 (共同第一作者) 负责文献检索、整理, 研究内容梳理, 论文初稿撰写; 姜大军、林媛、韩燕星负责新疆特色药材及制剂相关数据核实、表格整理, 药理作用部分补充完善; 张志利负责民族药多成分协同机制相关文献佐证与内容优化; 高天乐、韩祥志 (共同通讯作者) 负责研究方向设计、论文整体框架搭建, 内容审核与修改; 蒋建东负责论文最终定稿、质量把控, 提供研究思路与学术指导。

利益冲突: 本文所有作者声明不存在利益冲突关系。

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