

基于“脑-心-肾-精室”轴辨治前列腺癌的优势环节探讨

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2025-06-25 收稿, 2025-08-03 修回, 2025-09-30 接受, 2025-09-30 网络版发表

国家中医药管理局高水平中医药重点学科建设项目(zyyzdxk-2023238)资助

摘要 前列腺癌是严重威胁男性健康的恶性肿瘤, 现代医学在控制及生存质量方面仍面临诸多挑战, 如术后并发症、耐药性、生存质量下降等。本团队提出“脑-心-肾-精室”轴理论, 构建了前列腺癌病机以肾精亏虚为主、精室为核心病位, 脑心失调为枢、督脉为纽的辨治体系, 在临床实践中展现出独特优势。本文系统解析该理论体系在前列腺癌防治中的核心优势环节: (1) 多靶点调控前列腺癌变微环境, 延缓病机传变; (2) 干预雄激素受体信号, 延缓耐药进程优势; (3) 形神共调、身心同治, 改善晚期生存质量优势; (4) 以督脉为枢纽整合脑心肾精室, 实现整体与局部协同调控优势。这些优势环节深刻体现了该理论立足整体、病证结合、形神共调、多靶点干预的特色, 为中医药精准辨治前列腺癌及克服现代医学瓶颈提供了新思路和新策略。

关键词 前列腺癌, “脑-心-肾-精室”轴, 中医病机, 优势环节

前列腺癌作为男性泌尿生殖系统高发恶性肿瘤之一, 近年来发病率持续攀升^[1], 已跃居全球男性肿瘤第二位^[2]。现代医学治疗手段如手术、放疗、内分泌治疗等虽取得进展, 但仍存在一定的局限性: 早期手术治疗为患者提供根治机会, 但易出现术后尿失禁、性功能障碍等并发症^[3]; 放射治疗虽具有精准靶向的优势, 但易引发放射性直肠炎、膀胱刺激症状等相关症状; 新型内分泌疗法虽能延长去势抵抗性前列腺癌患者生存期, 但骨质疏松、代谢紊乱等副作用也严重影响患者生活质量^[4], 是提升临床疗效的主要障碍。前列腺癌归属于中医“精岩、癥瘕、精癥”等范畴, 其治疗注重整体调理与病机演变。中医治疗在改善其症状及生存质量方面具有优势^[5]。然而, 古代医家辨治本病对病位与病机关联的系统阐释尚不足, 缺乏立体辨治体系, 难以满足现代精准化治疗的需求, 一定程度上限制了其临床疗效。本团队在总结前人经验的基础上, 提出“脑-心-

肾-精室”轴理论, 构建整体与局部同治、形神共调的辨治体系具临床诊疗的优势性, 并取得较好的临床疗效^[6,7], 为中医药辨治前列腺癌提供了借鉴和参考。

1 “脑-心-肾-精室”轴辨治前列腺癌的理论核心

“脑-心-肾-精室”轴理论以肾为核心, 以精血为基础、督脉为纽带, 连接脑、心、肾、精室等脏器的辨治体系。精室作为男性生殖系统的核心结构与功能统称, 涵盖睾丸、前列腺等生殖器官及其相关功能, 亦是病位核心所在。该脏腑的位置在下焦少腹部, 此处是足厥阴肝经的循行路线, 受肝气疏泄调控; 同时经督脉贯通与脑、心紧密维系。精室具有化生贮藏精子、排泌精液、维持男子性功能及开阖精溺之窍的核心生理功能, 受肾气主宰并与冲任二脉相关。《黄帝内经·上古天真论》云: “七八, 天癸竭, 精少, 肾藏衰, 形体皆极”。随

引用格式: 李云智, 于文晓, 郭军, 等. 基于“脑-心-肾-精室”轴辨治前列腺癌的优势环节探讨. 科学通报, 2025, 70: 6040–6048

Li Y, Yu W, Guo J, et al. Theoretical and practical advantages of the “Brain-Heart-Kidney-Essence Chamber” axis in prostate cancer (in Chinese). Chin Sci Bull, 2025, 70: 6040–6048, doi: [10.1360/CSB-2025-5147](https://doi.org/10.1360/CSB-2025-5147)

着人体进入老年阶段,生理机能由盛转衰,气血逐渐亏虚。机体整体呈现出以肾精亏虚为核心的衰弱状态,导致正气不足,抵抗病邪的能力下降。此时,作为肾精重要承载之处的精室,其功能也随之衰退,局部气血运行不畅。这种环境使得邪毒易于聚集凝结,因此前列腺癌多见于老年人群^[8]。

1.1 肾精亏虚为本,精室邪实为标

“脑-心-肾-精室”轴理论强调肾与精室之间的密切联系,进一步阐释了“肾藏精主生殖”的科学内涵。其中,肾为体,储存着先天之精与后天之精,主管生殖功能,是生命之源;精室为用,能够生成精气、储存并排泄生殖之精,其正常功能的发挥,有赖于肾中精气的温暖和调控作用。

在前列腺癌的发病过程中,精室既是病邪侵袭的病位,更是病理产物蓄积的场所^[9]。其核心病机可概括为“本虚标实”:肾精亏虚是发病的根本原因,会导致气血运化功能失常、气化作用障碍,从而引起湿浊、痰凝、热毒、瘀血等病理产物的内生;标实之邪趁机聚集于精室,阻塞经络,最终形成有形的癌肿^[10]。这种虚实夹杂的病理状态,既反映出肾气亏虚致使精室失去温煦和固摄功能的虚损本质,又反映出湿、热、痰、瘀毒邪蕴结精室的病理实态,二者共同构成前列腺癌“本虚标实”的证候病变规律。

1.2 脑心失调为根,情志逆乱为候

“脑-心-肾-精室”轴理论认为脑与心为精神意识及情志活动的主宰,其中“脑中为元神,心中为识神”,二者协同调控人的神志。肝为脑心所统属的重要器官,其疏泄功能受到脑心之神的制导^[11]。

前列腺癌患者晚期呈现的抑郁、焦虑等情志异变,本质是病程迁延导致气血阴阳俱损的病机演变^[12]。心气耗散会导致心神失去滋养,心血不足则使心神不宁,肾精枯竭进而致使脑髓失去充养,最终造成向上不能荣养脑髓、在中不能滋养心脏、向下无法滋补肾精的病理状态,疾病也因此逐渐加深。脑作为元神所在之处,心是统帅全身的君主;脑髓不充盈则元神功能失常,心血不充足则识神失于濡养。脑与心的功能失调互为因果,不仅致使神志活动失常而出现情绪紊乱的表现,还会通过脑与心之间的病理传导机制,使机体正气虚损和邪气壅滞相互交织,形成一种正虚与邪实混杂的恶性循环,从而加速癌症的进展与恶化。

另外,晚期前列腺癌疼痛证候的发生,亦与脑心功能失常相关。心主导血脉运行并蕴藏神志。癌毒长期存在会导致气血运行不畅,一方面可造成血液瘀滞、脉络不通,表现为“不通则痛”;另一方面会导致血脉不充盈,血管失于濡养,从而形成“不荣则痛”^[13]。究其根本,二者皆因心神失于调控、血脉失于濡养所致。前列腺癌晚期出现的顽固性疼痛与情志异常,既是局部气血壅滞的病理产物,更是脑心共主神明功能失常的全身性征象,标志着病势已由局部癥积向脑心系统整体调控失序的深重阶段演进。

2 基于“脑-心-肾-精室”轴理论病机演变的阶段化辨治

“脑-心-肾-精室”轴辨治体系认为,前列腺癌的核心病变部位虽然在精室,但其发生发展的根本原因在于肾精亏虚与气化功能障碍,导致精室失去温煦和濡养,最终形成癌肿。湿、热、痰、瘀、毒等标实之邪,或是由于肾虚导致气化不利而生,或是因外邪侵袭而凝聚。这些病理因素相互搏结,与败坏的津精一同壅滞在精室,从而促成疾病。整体而言,其病机演变呈现“虚-郁-瘀-毒”的动态传变规律。

2.1 多靶点调控前列腺癌微环境,延缓病机传变

从疾病发展阶段来看,早期以肾精亏虚、精室湿毒为主要病机。此阶段多对应于临床分期T1~T2a期,PSA水平通常<10 ng/mL, Gleason评分≤6分,病理上可表现为高级别前列腺上皮内瘤变或局限性腺肿瘤,影像学上未见远处转移。在此阶段,肾气已经虚衰,导致气化功能不利,水湿代谢失常,继而湿浊从内产生。湿浊蕴结日久则化为毒邪,最终阻滞精室的脉络。早期常无明显不适症状,此时以辨病为先,祛除精室邪毒为主,采用补肾填精,利湿解毒的治法。建议方剂:黄药除湿方;组成:黄柏、山药、土茯苓、芡实、菟丝子、党参、半枝莲、浙贝母。本方以“脑-心-肾-精室”轴理论为指导,黄柏清泻下焦湿热,直折精室邪毒;土茯苓、半枝莲清热解毒、利湿通淋;山药、芡实、菟丝子健脾补肾、固精止遗,兼顾肾虚之本;党参益气健脾,扶正祛邪;浙贝母化痰散结。全方通过药物的协同作用,达到补肾、利湿与解毒的综合疗效。

在该阶段,“脑-心-肾-精室”轴理论与前列腺癌的发生、发展存在密切对应关系。研究表明,前列腺微环境中的慢性炎症反应是早期癌变的重要启动因素^[14],

炎症因子持续刺激诱导上皮细胞异常增生,同时激活氧化应激反应,导致DNA损伤修复机制失衡^[15,16],这与中医“湿毒蕴结、损伤精室”的病理过程契合。

研究发现前列腺上皮内瘤(prostate intraepithelial tumor, PIN)作为癌前病变阶段,常伴随染色体8p缺失和前列腺增生性炎性萎缩(prostatic hyperplastic inflammatory atrophy, PIA)等病理特征^[17]。Langston等人^[18]发现,慢性炎症与PIA的存在显著增加了前列腺癌的风险,其机制在于炎症微环境通过激活氧化应激反应、破坏DNA损伤修复机制,同时诱导NF- κ B等转录因子异常活化,形成肿瘤相关性炎症的恶性循环。Wu和Casey^[19]研究发现,氧化应激和DNA修复途径的种系变化可能导致前列腺癌变,并且这些关联可能因前列腺内性类固醇激素状态而异,并因抗氧化状态而进一步改变。

因此,在治疗层面,基于“补肾解毒”治则的中药配伍呈现多维度、多靶点调控癌前病变微环境的显著优势,有效阻截“虚-郁-瘀-毒”病机链条的启动,弥补了现代医学在癌前干预方面药物手段相对匮乏的不足。其中菟丝子、山药补肾固本,通过调节下丘脑-垂体-性腺轴功能改善内分泌稳态^[20];黄柏配伍土茯苓清热利湿,可显著抑制IL-6、TNF- α 等促癌炎症因子释放^[21];半枝莲协同浙贝母解毒散结,有效阻断NF- κ B信号通路介导的炎癌转化进程^[22]。该策略既契合中医以肾精亏虚为本、湿毒蕴结为标的核心病机,又通过多靶点协同作用阻断由慢性炎症向微环境失衡演进,并最终导致基因组不稳定的关键病理进程,在改善肾虚湿热证相关症状的同时,重塑前列腺免疫编辑微环境,为阻截PIA向高级别PIN演进提供了中西医结合的干预范式。

2.2 多角度干预雄激素受体信号,延缓疾病进程

前列腺癌中期病机演变为肾精亏虚、精室瘀毒。此阶段多对应于临床分期T2b-T3期,PSA水平常在10~20 ng/mL之间,Gleason评分为7分,可伴有局部侵犯,但尚未见远处转移。随着疾病进展,湿浊、痰凝等病理产物会进一步阻碍气血的运行,继而导致瘀血内生;瘀血又与原有的毒邪相互结合,最终形成“瘀毒互结”的证候。此时出现小便涩,尿线变细,甚或点滴难出,小腹、会阴部、睾丸局部坠胀不适,舌质紫或瘀斑,脉涩或细涩。采用补肾填精,化瘀解毒的治法。建议方剂:地益通瘀方;组成:熟地黄、益母草、红景天、鬼箭羽、水红花子、肉桂、川牛膝。本方以熟地黄滋

阴补肾、填精益髓;益母草、红景天活血化瘀、通络解毒;鬼箭羽、水红花子活血消癥、散结止痛;川牛膝引药下行,直达精室;肉桂温阳化气,助活血化瘀之力。

该阶段瘀毒蕴结的病机环节可延伸至雄激素受体(androgen receptor, AR)信号通路的异常活化。研究表明,病理性AR信号通路的稳态失衡(包括受体过度激活、突变积累等)可显著增强前列腺细胞对雄激素的异常敏感性^[23],这一机制贯穿前列腺癌发生、复发及转移的全病程。从分子调控层面分析,AR蛋白表达水平直接决定其经典信号通路的激活阈值。

中药可通过多途径的干预实现AR的动态调控。例如,雷公藤甲素能显著降低AR的mRNA及蛋白表达水平,从转录及翻译层面抑制AR信号传导^[24];姜黄素通过降低AR的转录活性和蛋白表达,以及下调PSA蛋白表达,抑制LNCaP中肿瘤坏死因子诱导的NF- κ B活化来促进细胞凋亡^[25];淫羊藿苷、补骨脂素等植物雌激素样成分,通过竞争性结合AR受体,下调PSA、HK2等AR靶基因表达,阻断异常活化的信号转导^[26,27]。

从中医辨治角度来看,肾精亏虚、精室瘀毒的病理特点可能与AR异常激活及其信号通路的改变密切相关。肾精亏虚、精室失养是瘀毒滋生与演化的土壤,而AR通路的异常活化正是瘀毒内结在微观层面的核心体现:肾精亏虚导致精室失于濡养,机体调控失守,瘀毒乘虚发作,驱动AR通路发生异常活化与恶性演化,进一步阻滞精微输布,反耗精气,加剧其病理进程。补肾填精法可通过重塑精室微环境稳态,改善细胞能量代谢与氧化还原平衡,进而调控AR介导的细胞周期进程;化瘀解毒法则针对“瘀毒”病性特征,通过表观遗传修饰阻断AR信号异常传导。而通过补益肾精的药物如熟地黄等,其作用呈现双向调节特征,既可有效滋补肾精,又能通过化瘀解毒的作用,帮助消除前列腺癌细胞内的瘀毒,从而达到抑制肿瘤生长的目的。这种多靶点、动态的干预策略,不仅有助于控制肿瘤生长,更关键的是能延缓或逆转肿瘤细胞对内分泌治疗的适应性改变,为克服或延缓去势抵抗期前列腺癌发生提供了不同于单靶点抑制剂的新思路,体现了精准干预核心驱动通路、延长药物敏感窗的优势。

2.3 注重形神共调与身心同治,提高生存质量

前列腺癌晚期呈现肾精亏虚,精室瘀毒的证候。此阶段多见于临床分期T4期或任何T伴N1/M1,PSA水平多>20 ng/mL,Gleason评分 $\geq$ 8分,常伴有骨转移或淋巴

结转移。由于癌毒顽固难除,会持续消耗人体的气血精髓,进而导致正气严重虚弱而邪气愈加亢盛的病理状态。采用滋肾填髓、消瘤解毒的治法。此时患者小便艰涩刺痛、尿细如线或点滴难出,小腹会阴睾丸刺痛固定,口唇青紫,舌质紫暗瘀斑,脉涩细。建议方剂:杞葵抗癌方;组成:枸杞子、益智仁、龙葵、黄精、金雀根、猫爪草、红景天。本方以枸杞子、黄精滋阴填精、补益肝肾;龙葵、猫爪草清热解毒、散结消瘤;金雀根、红景天活血化瘀、扶正抗癌;益智仁安神益智、调和心神。通过补肾填精以扶正,消瘤解毒以祛邪,协调阴阳关系,以平为期。

从分子病理机制演进视角,随着病情进展,AR信号通路不仅通过经典配体依赖性途径异常激活,也可以因受体变异或旁路激活如PI3K/Akt、Wnt/ β -catenin等通路交叉的影响,进而由去势敏感期前列腺癌进展为去势抵抗期前列腺癌^[28]。具体而言,抗雄药物耐药性引发AR突变,致其由抑癌因子反转为促癌因子,这是药毒化火,克邪之药反成助邪之资;AR蛋白过度表达于肾精亏虚之体,强行维系肿瘤增殖,呈现虚阳浮越的状态;不依赖配体的AR剪切变异体持续活化,表现出伏毒内生的性质,癌毒脱离正虚环境自主驱动,向恶性演变。在治疗上一方面,补肾中药可调节下丘脑-垂体-性腺轴功能,可有效改善雄激素剥夺疗法等内分泌治疗所致的性腺功能减退相关副作用,如潮热、乏力、骨代谢异常等,显著提升患者生活质量。另外,补肾填精药物能够抑制AR信号通路的异常激活,下调AR蛋白表达及核转位,从而延缓前列腺癌细胞对内分泌治疗的耐药进程,为临床延缓疾病进展提供新的思路。另一方面,滋肾填髓、消瘤解毒的治法可通过调节肿瘤微环境,抑制炎症因子分泌,增强抗氧化应激能力,改善免疫监视功能,进而抑制癌毒的侵袭、降低转移风险,延长患者生存期^[29,30]。

研究表明,中药还可广泛调控前列腺癌多条关键信号通路^[31-34],如Notch信号通路(大黄素、姜黄素、人参皂苷Rh2、异荭草素等)、PI3K/Akt信号通路(苦参碱、黄芩素、淫羊藿素、肿节风、前列消癥汤、中药复方CFF-1等)、Wnt/ β -catenin信号通路(前列消癥汤、槲皮素等)、TGF- β /Smads信号通路(连翘三萜类化合物、姜黄素等)、NF- κ B信号通路(雷公藤红素、冬凌草甲素、姜黄素等)。中药还可以通过调控前列腺癌细胞周期、凋亡、迁移、侵袭等生物学行为,调节肿瘤细胞对化疗的敏感性,发挥抑瘤及辅助治疗增敏的作

用,在综合改善晚期患者生存质量方面具有整体调节的独特优势,弥补了现代医学在晚期姑息治疗中侧重于局部病灶或单一症状控制、对整体关注不足的短板。这种将抗肿瘤、缓解躯体症状与改善心理精神障碍融为一体的“身心同治”策略,显著提升了晚期患者的整体舒适度和生活质量,体现了中医以人为本、关注整体生存状态的核心优势。

3 基于“脑-心-肾-精室”轴理论的动态诊疗策略

“脑-心-肾-精室”轴理论中脑心同调阐释了前列腺癌疾病发展过程中情志变化逐渐加深的机制,揭示了情志致病因素从“形神互动”到“形神共损”的动态演变过程。即从初始的“肝郁”状态,逐步发展至“脑心失调”。

3.1 督脉通调脑心肾,气血共养

督脉作为经络系统中“阳脉之海”,在脑心肾的关系中发挥着关键的传递作用。督脉的走行可分为四个部分:第一支沿脊柱正中线上行入脑;第二支向前贯穿肚脐并联系心脏;第三支与足太阳膀胱经并行,贯穿脊柱并连属于肾脏;第四支则行于脊柱内部,夹脊而下,抵达腰中与肾相联络。现代解剖学发现,督脉主干与中枢神经系统、交感神经链分布高度重叠,其腰肾分支区域恰与肾动脉、肾上腺的神经支配区相对应,为“经气-神经-体液”三位一体调控提供了结构基础。这一独特的循行路径,使督脉成为调控脑心肾轴体系的核心枢纽。心之气血顺着督脉而上输于脑,经脉气血通过阳经流注到头面诸窍,与脑相联系,所以心可通过经脉气血流注与脑建立密切关联^[35]。同时,心通过血液将多种营养成分运送至全身,滋养大脑,助力其正常生理功能的发挥。核磁共振研究也显示,针刺督脉大椎穴可同步激活岛叶与默认模式网络,证实其对心脑共轭功能的调节效应。反之,脑的功能失调也可能引发心脏的异常反应,体现了心脑之间的双向互动关系。

3.2 补肾益脑调心神,形神共调

脑的正常功能依赖于肾精、气血的不断蒸腾气化及上行滋养。只有在精髓纯正充实,能够正常抵御外邪侵扰的情况下,脑作为“元神之府”才能有效控制人体的感觉和精神活动。前列腺癌晚期患者,多因肾虚精亏,导致脑髓失养,进而出现焦虑、抑郁等精神疾病状态。研究表明,这种生理关系可能与下丘脑-垂体-性腺

轴有关^[36]。肾精亏虚致髓海空虚，引发下丘脑-垂体-肾上腺轴负反馈失调，临床表现为皮质醇持续升高，直接抑制海马神经发生。研究证实患者血清皮质醇水平与抑郁评分呈显著正相关^[37]。同时，肾精不能上奉于心，导致色氨酸代谢障碍，5-羟色胺及去甲肾上腺素合成减少，突触间隙单胺递质不足^[38]。因此，情志逆乱本身亦会加剧病势，忧思郁怒致肝失疏泄，气机郁结进一步激活HPA轴与炎症反应，促进IL-6、TNF- α 等促癌因子释放，通过NF- κ B通路驱动癌毒增殖扩散，最终从肝气郁滞发展为脑心失调，深刻阐释了“脑心为根、情志为

候”的理论意义；前列腺癌细胞通过雄激素受体信号异常激活，导致促性腺激素释放激素分泌节律紊乱，继而引发5-羟色胺/去甲肾上腺素能系统失衡，亦是“脑心失调”的神经内分泌基础^[39]。因此在治法上注重补益心脑，清心宁神，不仅能够改善患者放化疗后的焦虑抑郁状态，还能对相关的焦虑抑郁神经内分泌紊乱起到治疗作用。

3.3 协调整体顾局部，身心同治

在治疗上还要注重形神一体，身心同治。“身心一

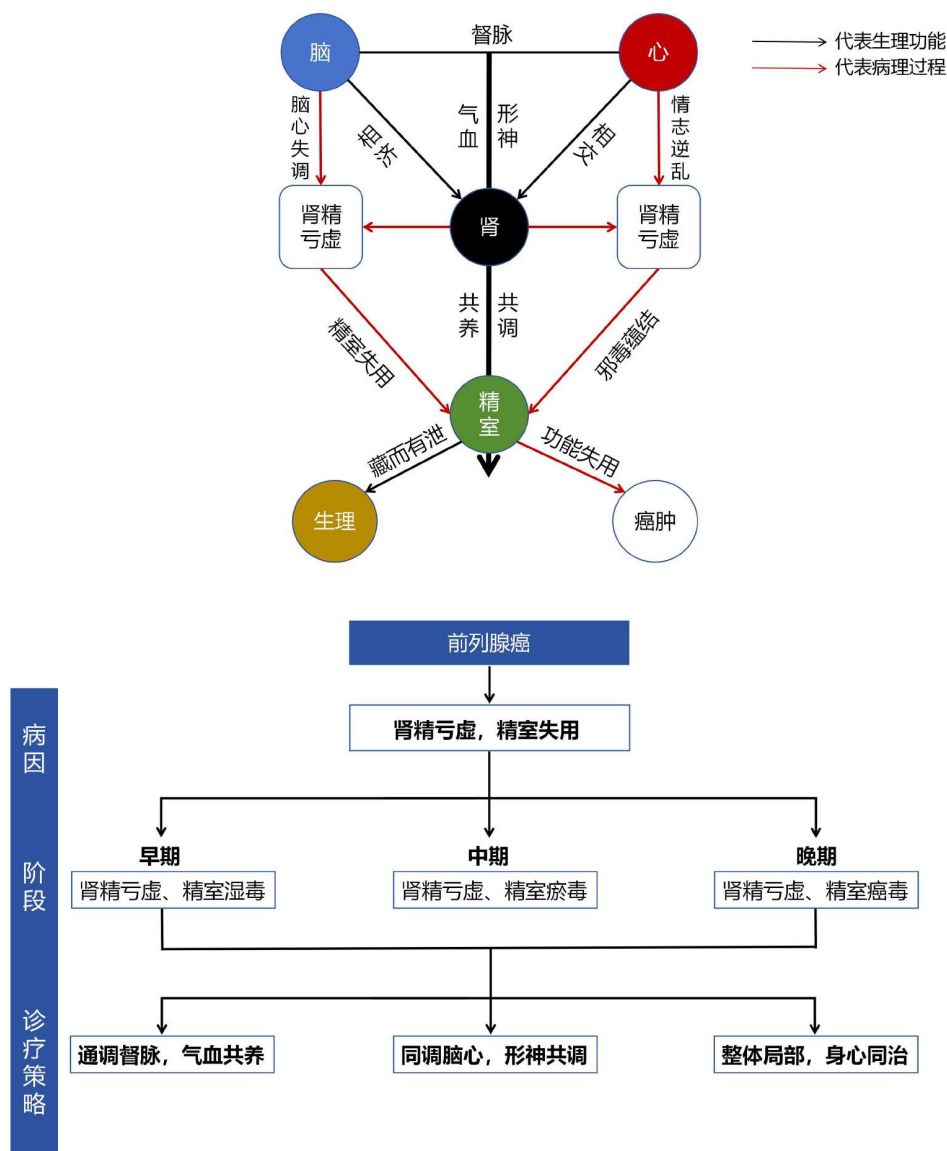


图1 “脑-心-肾-精室”轴理论框架下的前列腺癌发病与辨证思路示意图

Figure 1 Schematic diagram of the pathogenesis and pattern identification/treatment approach of prostate cancer under the “Brain-Heart-Kidney-Essential Chamber” axis theoretical framework

元,形乃神之基”^[40],精神意识必须依存于身体这一物质基础,并不存在能够脱离肉体而独立主宰生命活动的精神。前列腺癌晚期患者,人体已进入末期,呈现精极血枯的状态。在此阶段,从心脑论治,一方面滋补肾精,补益脑髓,以培补后天之本,延缓精亏血枯的进程,延长患者的生存周期;另一方面,通过调节心脑功能,缓解晚期前列腺癌引起的疼痛等不适症状,以期实现更好的临床效果,提升患者的生活质量。这种将整体观念、经络理论与西医机制相结合的脑心论治方法,为晚期前列腺癌的治疗提供了独特的思路和有效的途径。

4 总结与展望

“脑-心-肾-精室”轴理论注重整体与局部同治,构建了以肾精亏虚为本,湿、热、痰、瘀、毒邪为标的

前列腺癌辨治体系。揭示了疾病从“肾虚精亏,精室湿毒”到“肾虚精亏,瘀毒互结”再到“肾虚精亏,精室癌毒”的阶段性病机演变规律。该理论立足肾与精室的体用关系,阐明肾精亏虚导致精室功能失调、病理产物蓄积的核心机制,同时通过脑心同调阐释情志异常、疼痛证候与癌病进展的双向影响,凸显督脉连接脑心肾的经络纽带作用,形成“形神共调、上下同治”的诊疗特色(图1)。未来,我们将进一步开展临床证型研究,建立基于“脑-心-肾-精室”轴理论辨治前列腺癌的辨证标准。同时,结合多组学联合分析以及人工智能技术寻找中医药在以上优势环节治疗前列腺癌的靶标,探索其介导的信号通路、基因表达调控网络及细胞生物学效应,从而解释中医药干预前列腺癌的潜在分子作用机制,为中医药治疗方案的精准化开发提供理论支撑。

参考文献

- 1 Rebello R J, Oing C, Knudsen K E, et al. Prostate cancer. *Nat Rev Dis Primers*, 2021, 7: 9
- 2 Bray F, Laversanne M, Sung H, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*, 2024, 74: 229–263
- 3 Pyrgidis N, Chaloupka M, Ebner B, et al. Perioperative complications of focal therapy for prostate cancer: results from the GeRmAn Nationwide inpatient Data (GRAND) study. *BJU Int*, 2025, 136: 306–313
- 4 Che J, Liu Y, Liu Y, et al. The application of emerging immunotherapy in the treatment of prostate cancer: progress, dilemma and promise. *Front Immunol*, 2025, 16: 1544882
- 5 Yu W X, Guo J, Guo J, et al. Quality evaluation and consideration of randomized controlled clinical trials report on traditional Chinese medicine treatment of prostate cancer (in Chinese). *J Xinjiang Med Univ*, 2022, 45: 776–779 [于文晓, 郭军, 郭俊, 等. 中医药治疗前列腺癌随机对照试验报告的质量评价及思考. *新疆医科大学学报*, 2022, 45: 776–779]
- 6 Zeng Y, Zhang G L, Guo J, et al. Inflammatory factors and prostate cancer: a two-sample Mendelian randomization analysis (in Chinese). *Natl J Androl*, 2024, 30: 588–596 [曾银, 张甘霖, 郭军, 等. 两样本孟德尔随机化分析炎症因子与前列腺癌因果关系. *中华男科学杂志*, 2024, 30: 588–596]
- 7 Yu W X, Guo J, Wang F, et al. Medication rules of traditional Chinese medicine in the treatment of prostate cancer based on data mining (in Chinese). *World Chin Med*, 2023, 18: 99–103 [于文晓, 郭军, 王福, 等. 基于数据挖掘的前列腺癌中药用药规律研究. *世界中医药*, 2023, 18: 99–103]
- 8 Guo J. Theoretical construction and application of “Brain-Heart-Kidney-Essence Chamber” axis in andrology of traditional Chinese medicine (in Chinese). *World J Integr Tradit West Med*, 2020, 15: 1553–1556 [郭军. “脑-心-肾-精室”轴在中医男科学中的理论构建及应用. *世界中西医结合杂志*, 2020, 15: 1553–1556]
- 9 Wang H, Zhang J W, Yan B, et al. Analysis on the application of essence chamber theory in andrology of traditional Chinese medicine (in Chinese). *Acta Chin Med Pharmacol*, 2023, 51: 1–6 [王浩, 张继伟, 晏斌, 等. 精室理论在中医泌尿男科中的应用探析. *中医药学报*, 2023, 51: 1–6]
- 10 Guo J. Treatment of prostate cancer based on “kidney-essence chamber” theory (in Chinese). *Chin J Integr Tradit West Med*, 2024, 44: 1413–1416 [郭军. 基于“肾-精室”理论辨治前列腺癌. *中国中西医结合杂志*, 2024, 44: 1413–1416]
- 11 Peng L Y, Yi Y Q, Zhu X, et al. Exploring the scientific connotation of the “heart-brain communication” theory in traditional Chinese medicine based on the debate of “who is the master of the spirit” (in Chinese). *J Shaanxi Univ Chin Med*, 2023, 46: 46–50 [彭罗燕, 易亚乔, 朱莹, 等. 基于“神明孰主”之争探讨中医“心脑相通”理论的科学内涵. *陕西中医药大学学报*, 2023, 46: 46–50]
- 12 Zhou Q, Tian X F, Chang D G, et al. Chinese expert consensus on diagnosis, treatment, and health management of prostate cancer with integrated traditional Chinese and Western medicine (in Chinese). *Natl J Androl*, 2022, 28: 941–953 [周青, 田雪飞, 常德贵, 等. 前列腺癌中西医结合诊疗与健康管理中国专家共识. *中华男科学杂志*, 2022, 28: 941–953]
- 13 Ni B Y, Zhu X Y, Li J. Thoughts and methods in treatment of cancer pain based on theory of “all pain, itchiness or sore disorders pertaining to the

- heart” (in Chinese). *J Beijing Univ Tradit Chin Med*, 2021, 44: 764–768 [倪宝毅, 朱潇雨, 李杰. 基于“诸痛痒疮, 皆属于心”理论探讨癌性疼痛治疗的思路与方法. 北京中医药大学学报, 2021, 44: 764–768]
- 14 Syahrir S, Palinrungi M A, Hatta M, et al. The impact of inflammation on prostate tumor dynamics: a pathological perspective on prostate cancer and benign prostatic hyperplasia. *Arch Ital Urol Androl*, 2025, doi: 10.4081/aiua.2025.13353
- 15 Gong Z, Platek M E, Till C, et al. Associations between polymorphisms in genes related to oxidative stress and DNA repair, interactions with serum antioxidants, and prostate cancer risk: results from the prostate cancer prevention trial. *Front Oncol*, 2021, 11: 808715
- 16 Chau C H, Till C, Price D K, et al. Serum markers, obesity and prostate cancer risk: results from the prostate cancer prevention trial. *Endocrine-Relat Cancer*, 2022, 29: 99–109
- 17 Bostwick D G, Cheng L. Precursors of prostate cancer. *Histopathology*, 2012, 60: 4–27
- 18 Langston M E, Sfanos K S, Khan S, et al. Why do epidemiologic studies find an inverse association between intraprostatic inflammation and prostate cancer: a possible role for colliding bias? *Cancer Epidemiol Biomarkers Prevention*, 2021, 30: 255–259
- 19 Wu D, Casey P J. GPCR-Gα13 involvement in mitochondrial function, oxidative stress, and prostate cancer. *Int J Mol Sci*, 2024, 25: 7162
- 20 Feng R, He M C, Li Y, et al. Research progress on the regulation of kidney-tonifying Chinese herbs on brain based on theory of “interaction between kidney and brain” (in Chinese). *Chin J Tradit Chin Med Pharm*, 2021, 36: 2179–2183 [冯睿, 赫明超, 李钺, 等. 基于“肾脑相济”理论探讨补肾中药调控脑作用的研究进展. 中华中医药杂志, 2021, 36: 2179–2183]
- 21 Wang H K, Li M, Xie J, et al. Effect of Cortex Phellodendri extract berberine on intimal hyperplasia and inflammatory factors after carotid artery balloon injury in rats (in Chinese). *Mod J Integr Tradit Chin West Med*, 2016, 25: 3994–3996 [王鸿康, 李鸣, 谢隽, 等. 黄柏提取物小檗碱对大鼠颈动脉球囊损伤后内膜增生及炎性因子的影响. 现代中西医结合杂志, 2016, 25: 3994–3996]
- 22 Cicero A F G, Allkanjari O, Busetto G M, et al. Nutraceutical treatment and prevention of benign prostatic hyperplasia and prostate cancer. *Arch Ital Urol Androl*, 2019, 91: 3
- 23 Wasim S, Lee S Y, Kim J. Complexities of prostate cancer. *Int J Mol Sci*, 2022, 23: 14257
- 24 Liu B D, Feng Q Q, Gu X, et al. Effects of triptolide on androgen receptor expression in human prostate LNCaP cells and its mechanism (in Chinese). *Acta Pharm Sin*, 2015, 50: 1246–1251 [刘彼得, 冯倩倩, 顾晓, 等. 雷公藤内酯醇对人LNCaP细胞雄激素受体表达的调控及其机制. 药学报, 2015, 50: 1246–1251]
- 25 Termini D, Den Hartogh D J, Jaglanian A, et al. Curcumin against prostate cancer: current evidence. *Biomolecules*, 2020, 10: 1536
- 26 Miao L, Yun X, Tao R, et al. Bakuchiol exhibits anti-metastasis activity through NF-κB cross-talk signaling with AR and ERβ in androgen-independent prostate cancer cells PC-3. *J Pharmacol Sci*, 2018, 138: 1–8
- 27 Xu B, Jiang C, Han H, et al. Icaritin inhibits the invasion and epithelial-to-mesenchymal transition of glioblastoma cells by targeting EMMPRIN via PTEN/Akt/HIF-1α signalling. *Clin Exp Pharma Physiol*, 2015, 42: 1296–1307
- 28 Westaby D, Fenor de La Maza M L D, Paschalis A, et al. A new old target: androgen receptor signaling and advanced prostate cancer. *Annu Rev Pharmacol Toxicol*, 2022, 62: 131–153
- 29 Xu X Y, Fei C Y, Xu Q, et al. Contraindications and countermeasures of kidney-tonifying therapy for advanced prostate cancer (in Chinese). *Chin J Tradit Med Sci Technol*, 2022, 29: 221–223 [徐新宇, 费辰宇, 徐谦, 等. 补肾法治疗晚期前列腺癌的禁忌与对策. 中国中医药科技, 2022, 29: 221–223]
- 30 Xiong T Y, Zhao Y Q, Xie P, et al. Advances in research on the interaction mechanisms between androgen receptor and PI3K/AKT pathways in prostate cancer (in Chinese). *J Capital Med Univ*, 2025, 46: 269–282 [熊天宇, 赵有权, 谢萍, 等. 雄激素受体与PI3K/AKT通路相互作用机制在前列腺癌中的研究进展. 首都医科大学学报, 2025, 46: 269–282]
- 31 Nunes J J, Pandey S K, Yadav A, et al. Targeting NF-kappaB signaling by artesunate restores sensitivity of castrate-resistant prostate cancer cells to antiandrogens. *Neoplasia*, 2017, 19: 333–345
- 32 Nwabo K A H, Takam K P, Tagne S R, et al. Developmental pathways associated with cancer metastasis: Notch, Wnt, and Hedgehog. *Cancer Biol Med*, 2017, 14: 109–120
- 33 Xiao Y F, Yong X, Tang B O, et al. Notch and Wnt signaling pathway in cancer: crucial role and potential therapeutic targets (Review). *Int J Oncol*, 2016, 48: 437–449
- 34 Kaplan Z, Zielske S P, Ibrahim K G, et al. Wnt and β-catenin signaling in the bone metastasis of prostate cancer. *Life*, 2021, 11: 1099
- 35 Zhao Y N, Wu W Z, Liu C Y, et al. Theory exploration of Tongdu Tiaoshen acupuncture in the treatment of insomnia (in Chinese). *J Clin Acupunct Moxibust*, 2019, 35: 1–4 [赵亚楠, 吴文忠, 刘成勇, 等. “通督调神”针法治疗失眠的理论探微. 针灸临床杂志, 2019, 35: 1–4]
- 36 Yang J T, Guo J, Gao Q H, et al. Biological basis of benign prostatic hyperplasia from the “Brain-Heart-Kidney-Essence Chamber” axis (in Chinese). *World J Integr Tradit West Med*, 2024, 19: 1251–1255 [杨九天, 郭军, 高庆和, 等. 基于“脑-心-肾-精室”轴理论探讨良性前列腺增生症的生物学基础. 世界中西医结合杂志, 2024, 19: 1251–1255]
- 37 Feng X, Jia M, Cai M, et al. Central-peripheral neuroimmune dynamics in psychological stress and depression: insights from current research. *Mol Psychiatry*, 2025, 30: 4881–4898

- 38 Chang L, Wei Y, Hashimoto K. Brain-gut-microbiota axis in depression: a historical overview and future directions. [Brain Res Bull](#), 2022, 182: 44–56
- 39 Zhao M, Gao Q H, Wang F, et al. Exploration into the biological basis of male diseases based on the theory of “Brain-Heart-Kidney-Essence chamber” axis (in Chinese). *Natl J Androl*, 2024, 30: 915–920 [赵明, 高庆和, 王福, 等. 基于“脑-心-肾-精室”轴理论探讨男科疾病的生物学基础. *中华男科学杂志*, 2024, 30: 915–920]
- 40 Wang W Z. Brief understanding of “heart and brain as an integrated entity governing mental activities” (in Chinese). *Chin Med Mod Dist Educ China*, 2009, 7: 204 [王文中. “心脑一体共主神明”浅识. *中国中医药现代远程教育*, 2009, 7: 204]

Summary for “基于‘脑-心-肾-精室’轴辨治前列腺癌的优势环节探讨”

Theoretical and practical advantages of the “Brain-Heart-Kidney-Essence Chamber” axis in prostate cancer

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Prostate cancer (PCa) ranks as the second most prevalent malignancy among men globally. Conventional treatments such as radical prostatectomy, radiotherapy, and androgen deprivation therapy have contributed to improved survival outcomes; however, they are associated with considerable adverse effects, including urinary incontinence, sexual dysfunction, metabolic disorders, osteoporosis, and the development of castration resistance. These limitations often result in diminished quality of life (QoL) and pose significant challenges in long-term disease management. Traditional Chinese Medicine (TCM) has historically emphasized holistic regulation and symptom alleviation, demonstrating unique advantages in enhancing tolerance to treatment and improving overall well-being. Nevertheless, the absence of a systematic theoretical framework that integratively links localized pathology with systemic dysregulation has hindered its application in modern precision medicine. This article proposes the “Brain-Heart-Kidney-Essence Chamber” Axis as a novel TCM conceptual framework for understanding and treating PCa. This model identifies kidney essence deficiency as the fundamental root of the disease, wherein pathological factors such as dampness, heat, phlegm, and stasis accumulate in the essence chamber (jing shi)—a functional system encompassing the prostate and related reproductive structures. Brain–heart dysregulation serves as a pivotal mechanism influencing emotional and psychological aspects, while the governor vessel (du mai) acts as a vital conduit interconnecting these systems. The axis facilitates stage-specific treatment strategies aligned with disease progression, from early localized cancer to advanced metastatic and castration-resistant stages. The core advantages of this integrative model include: (1) multi-target regulation of the prostate tumor microenvironment through the use of selected herbal formulations that modulate chronic inflammation, oxidative stress, and immune response, thereby delaying malignant transformation; (2) intervention in androgen receptor (AR) signaling pathways using specific herbal compounds that suppress AR overexpression and nuclear translocation, which contributes to delaying the onset of treatment resistance; (3) holistic mind–body coordination that alleviates depression, anxiety, and cancer-related pain through therapeutic principles focused on nourishing the heart and calming the spirit, significantly improving QoL in advanced stages; (4) synergistic integration of systemic and local treatments via the governor vessel, which anatomically and functionally links the brain, heart, kidneys, and essence chamber, enabling comprehensive therapeutic efficacy. These mechanisms underscore the theory’s foundation in holistic TCM principles, including disease-syndrome combination, dynamic pathological progression, and multi-level intervention. By establishing a refined model for syndrome differentiation and staged treatment, the “Brain-Heart-Kidney-Essence Chamber” Axis provides a valuable strategy for precision medicine in prostate oncology. It not only complements conventional biomedical approaches by addressing their limitations but also opens new avenues for scientific exploration into the mechanisms of TCM in modulating cancer biology and improving patient outcomes.

prostate cancer, “Brain-Heart-Kidney-Essence Chamber” axis, TCM disease mechanism, advantage

doi: [10.1360/CSB-2025-5147](https://doi.org/10.1360/CSB-2025-5147)