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不同麻醉方案对行前列腺电切术老年患者术后认知功能、预后恢复的影响

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【摘要】目的 探讨不同麻醉方案对行前列腺电切术老年患者术后认知功能、预后恢复的影响。**方法** 选取2021年3月至2024年3月在河南科技大学第一附属医院行前列腺电切术的老年患者110例,借助随机数字表,所有患者被随机分配至对照组(55例)或观察组(55例)。对照组采用1.5mg/kg丙泊酚+0.15mg/kg顺苯磺阿曲库铵+0.3μg/kg枸橼酸舒芬太尼,观察组采用0.2mg/kg注射用甲苯磺酸瑞马唑仑+0.15mg/kg顺苯磺阿曲库铵+0.3μg/kg枸橼酸舒芬太尼,记录两组麻醉苏醒指标(诱导时间、呼吸恢复时间、拔管时间、睁眼时间),并于术后3、6、12、24小时采用MMSE量表评估认知功能、VAS评分评估疼痛程度,同时统计围术期不良反应发生情况。**结果** 观察组麻醉苏醒质量优于对照组,表现为各项恢复时间指标均显著缩短($P<0.05$)。术后认知功能方面,观察组3h、6h、12h的MMSE评分更高($P<0.05$);术后镇痛方面,观察组3h、6h、12h、24h的VAS评分更低($P<0.05$)。两组围术期不良反应发生率未见显著差异($P>0.05$)。**结论** 瑞马唑仑在老年患者行前列腺电切术中的应用,相较于丙泊酚,能够缩短麻醉诱导及恢复时间,显著改善术后认知功能和减轻疼痛感,同时两者的不良反应发生率无显著差异,提示瑞马唑仑可能是更优的麻醉选择。

【关键词】 前列腺电切术; 老年; 瑞马唑仑; 丙泊酚; 认知功能; 不良反应**【中图分类号】** R697+.3**【文献标识码】** A**DOI:**10.3969/j.issn.1009-3257.2026.4.044

To Investigate the Effects of Different Anesthesia Regimens on Postoperative Cognitive Function and Prognosis in Elderly Patients Undergoing Transurethral Resection of the Prostate (TURP)

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Abstract: Objective To investigate the effects of different anesthesia regimens on postoperative cognitive function and prognosis in elderly patients undergoing transurethral resection of the prostate (TURP). **Methods** A total of 110 elderly patients who underwent transurethral resection of the prostate (TURP) at the First Affiliated Hospital of Henan University of Science and Technology from March 2021 to March 2024 were selected. Using a random number table, all patients were randomly assigned to either a control group (n=55) or an observation group (n=55). The control group received 1.5mg/kg propofol + 0.15mg/kg cisatracurium besylate + 0.3μg/kg sufentanil citrate, while the observation group received 0.2mg/kg remimazolam tosilate for injection combined with the same doses of cisatracurium besylate and sufentanil citrate. Anesthesia recovery indicators (induction time, respiratory recovery time, extubation time, and eye-opening time) were recorded for both groups. Cognitive function was assessed using the Mini-Mental State Examination (MMSE) scale, and pain levels were evaluated using the Visual Analog Scale (VAS) at 3, 6, 12, and 24 hours postoperatively. Additionally, the occurrence of perioperative adverse reactions was documented for both groups. **Results** The observation group exhibited superior anesthesia recovery quality compared to the control group, as evidenced by significantly shorter durations for all recovery time indicators (induction time, respiratory recovery time, extubation time, and eye-opening time ($P<0.05$)). Regarding postoperative cognitive function, the observation group had higher MMSE scores at 3, 6, and 12 hours post-surgery ($P<0.05$). In terms of postoperative analgesia, the observation group reported lower VAS scores at 3, 6, 12, and 24 hours postoperatively ($P<0.05$). No statistically significant difference was observed in the incidence of perioperative adverse reactions between the two groups ($P>0.05$). **Conclusion** Compared with propofol, remimazolam can shorten the time of anesthesia induction and recovery, significantly improve postoperative cognitive function and relieve pain in elderly patients undergoing transurethral resection of the prostate, and there is no significant difference in the incidence of adverse reactions between the two groups, suggesting that remimazolam may be a better anesthesia choice.

Keywords: Transurethral Resection of the Prostate; Old Age; Remimazolam; Propofol; Cognitive Function; Adverse Reactions

对于老年男性多发的良性前列腺增生,经尿道前列腺电切术(TURP)是临床上常用的治疗方式之一^[1-2]。据统计^[3-4],70岁以上男性中约有50%会出现不同程度的前列腺增生,且这一比

例在80岁以上男性中进一步上升至75%以上。因传统麻醉药物如丙泊酚在老年患者中的应用可能导致术后认知功能障碍,其发生率可高达20%至30%,亟须探索更安全有效的麻醉方

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案^[5-6]。瑞马唑仑凭借其超短效的药理特性，作为一种新型苯二氮䓬类药物，近年来备受临床医生关注。研究表明，瑞马唑仑在老年患者中的应用能够有效缩短麻醉诱导时间，并减少术后不良反应^[7]。此外，有研究指出，瑞马唑仑通过选择性作用于GABA-A受体，能够促进患者术后认知功能的恢复，并有效降低相关并发症的发生风险^[8]。然而，目前关于瑞马唑仑与丙泊酚在前列腺电切术老年患者中认知功能和不良反应影响的系统性研究仍然较为稀缺。因此，本研究旨在比较瑞马唑仑与丙泊酚对行前列腺电切术老年患者术后认知功能及不良反应的影响，为临床麻醉选择提供依据。

1 资料与方法

1.1 一般资料 本研究选取的110例老年病例均于2021年3月至2024年3月在河南科技大学第一附属医院因良性前列腺增生接受电切治疗。

纳入标准：具有行前列腺电切术的明确手术指征^[9]；认知正常；基线资料完整。排除标准：近3个月内有严重的精神疾病史或认知障碍；对瑞马唑仑或丙泊酚有严重过敏反应史；伴有心、肝、肾等重要脏器的重度功能不全，或其他系统性疾病；近6个月内有中风、脑外伤；严重的血液系统疾病等。借助随机数字表，所有患者被随机分配至对照组(55例)或观察组(55例)。对照组年龄60~79岁，平均(70.17±3.55)岁，体质量55~82kg，平均(67.33±3.87)kg。观察组年龄61~78岁，平均(71.54±3.36)岁，体质量55~81kg，平均(67.07±3.62)kg。两组一般资料比较差异不显著($P>0.05$)。

1.2 方法 全身麻醉诱导及维持方案如下：对照组采用丙泊酚联合阿片类镇痛药及肌松药方案。观察组则采用甲苯磺酸瑞马唑仑完全替代丙泊酚，具体而言，即以0.2mg/kg(诱导)及0.3~1mg/(kg·h)(维持)的甲苯磺酸瑞马唑仑替换对照组的丙泊酚1.5mg/kg(诱导)及3~8mg/(kg·h)(维持)。两组患者的其他用药，包括诱导期的顺苯磺阿曲库铵(0.15mg/kg)、舒芬太尼(0.3μg/kg)以及维持期的盐酸瑞芬太尼[6~18μg/(kg·h)]均保持一致。气管插管于诱导完成后进行，术中通过调节泵速将BIS值维持在40~60。

1.3 观察指标 本研究观察指标涵盖麻醉复苏、认知功能、术后疼痛及安全性四个方面。(1)麻醉恢复情况：记录麻醉诱导时间、术后呼吸恢复时间、拔管时间及患者睁眼时间。(2)认知功能评估：分别于术后3h、6h、12h、24h采用简易精神状态量表(MMSE)^[10]对患者进行测定。该量表涵盖定向、记忆、语言及推理等认知维度，其得分越高反映认知功能受损程度越轻微。(3)疼痛程度判定：于上述相同时间点(术后3h、6h、12h、24h)采用视觉模拟评分法(VAS)^[11]评估患者痛感。该方法以0~10分计分，评分高低与患者主观疼痛强度呈正相关。(4)不良反应监测：统计两组患者从麻醉开始至离开恢复室期间发生的各类不良事件。

1.4 统计学方法 应用SPSS 27.0软件行统计学分析，计量资料用($\bar{x} \pm s$)表示，比较用F检验，计数资料用[n(%)]表示，比较用 χ^2 检验，以 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组麻醉指标及苏醒情况比较 观察组苏醒质量优于对照组，表现为麻醉诱导、呼吸恢复、拔管及睁眼各项时间指标均较对照组明显缩短($P<0.05$)，见表1。

2.2 两组认知功能比较 与对照组相比，观察组术后认知功能恢复更为理想，术后3h、6h、12h的MMSE评分均显著升高($P<0.05$)，见表2。

2.3 两组疼痛程度比较 与对照组相比，观察组术后各时点(3h、6h、12h、24h)的疼痛程度均显著减轻，VAS评分更低($P<0.05$)，见表3。

2.4 两组不良反应比较 安全性评估显示，两组不良反应发生情况相当，组间比较差异不显著($P>0.05$)，见表4。

表1 两组麻醉指标及苏醒情况比较

组别	例数	麻醉诱导(s)	呼吸恢复(min)	拔管(min)	睁眼(min)
对照组	55	85.29±6.51	8.41±1.15	11.18±1.27	16.71±2.16
观察组	55	74.32±7.46	6.25±1.06	8.22±0.91	14.24±2.05
t		8.217	10.242	14.050	6.151
P		<0.001	<0.001	<0.001	<0.001

表2 两组认知功能比较(分)

组别	例数	3h	6h	12h	24h
对照组	55	18.57±2.11	23.36±2.12	26.25±1.83	29.16±0.58
观察组	55	20.38±1.88	24.61±2.34	27.87±1.76	29.31±0.66
t		4.750	2.936	4.732	1.266
P		<0.001	0.004	<0.001	0.208

表3 两组疼痛程度比较(分)

组别	例数	3h	6h	12h	24h
对照组	55	2.33±0.61	3.65±0.55	2.53±0.54	1.95±0.34
观察组	55	2.12±0.45	3.25±0.38	2.31±0.42	1.82±0.25
t		2.055	4.437	2.385	2.285
P		0.042	<0.001	0.019	0.024

表4 两组不良反应比较[n(%)]

组别	例数	躁动	恶性呕吐	苏醒延迟	共计
对照组	55	4(7.27)	1(1.82)	2(3.64)	7(12.73)
观察组	55	1(1.82)	0(0)	1(1.82)	2(3.64)
χ^2					3.025
P					0.082

3 讨论

观察组麻醉苏醒速度优于对照组，考虑与甲苯磺酸瑞马唑仑的药理优势相关。研究^[12]指出，这一新型苯二氮䓬类药物与传统丙泊酚相比，其突出特点为起效快速且体内代谢过程更为迅速。甲苯磺酸瑞马唑仑不仅能快速诱导麻醉，还能在维持麻醉深度的同时，提供更快的清醒和恢复速度，且其半衰期较短，可以减少药物在体内的蓄积，从而加快术后苏醒^[13-14]。此外，甲苯磺酸瑞马唑仑的代谢途径主要通过非肝脏途径，使其代谢不易受肝功能

影响,对于一些肝功能受损的患者尤为重要,其代谢产物无药理活性,更有利于术后神志的迅速恢复^[15]。其次观察组在麻醉维持阶段使用了较低剂量的甲苯磺酸瑞马唑仑与盐酸瑞芬太尼的组合,这种组合可以减少对循环系统的抑制影响,同时维持足够的镇静和镇痛效果。瑞芬太尼以其超短效、快起效、短作用的药理学特点,在与甲苯磺酸瑞马唑仑的联合应用中产生协同效应,不仅降低了麻醉药物的整体用量,还有效规避了术后过度镇静的风险^[16-17]。因此,这种优化的麻醉药物组合和剂量管理策略,不仅提高了麻醉诱导和苏醒的效率,还可能减少术后并发症的发生率,提高了患者的麻醉体验和安全性。这些因素综合作用,可能是导致观察组在麻醉诱导时间、呼吸恢复时间、拔管时间和睁眼时间上表现出优于对照组的主要原因。

本研究还发现,观察组术后3h、6h、12h认知功能评分均高于对照组。甲苯磺酸瑞马唑仑具有起效快、代谢迅速、半衰期短的特点。与传统麻醉药物如丙泊酚相比,甲苯磺酸瑞马唑仑在体内更快地被代谢和清除,减少了药物在组织中的蓄积,从而降低了对中枢神经系统的长期抑制^[18-19]。说明术后患者的神经功能可以更快地恢复到接近基线状态,从而在早期的时间点上表现出更好的认知功能。其次瑞芬太尼作为观察组麻醉方案中的另一个重要药物,其超短效的特点使得其镇痛效果迅速消退,减少术后麻醉药物对大脑的残余影响^[20-21]。瑞芬太尼的代谢不依赖于器官功能,这使其在多种患者群体中,包括肝肾功能下降的患者中,都是一个可靠并且安全的选择,确保术后患者不会因为药物未被及时代谢而出现过度镇静或者认知功能障碍^[22]。

本研究结果表明,观察组术后3h、6h、12h、24h疼痛程度评分均低于对照组。瑞芬太尼通过选择性激动 μ 阿片受体发挥强效镇痛作用,其药代动力学优势表现为起效与消除过程均十分迅速,因而术中可使用可获得满意的镇痛效果^[23]。瑞芬太尼由于其超短效的性质,即使在术中用药结束后,患者仍然受益于其中枢神经系统的强大镇痛作用^[24]。其快速代谢特点减少了术后阿片类药物蓄积导致的呼吸抑制和镇痛不足,从而避免了术后急性疼痛的反弹。同时甲苯磺酸瑞马唑仑的使用也起到了关键作用。尽管主要作为镇静剂,其在术中和术后对患者的焦虑和紧张情绪有显著的减缓作用。焦虑和紧张是疼痛感知的放大器,甲苯磺酸瑞马唑仑通过改善患者的心理状态,使得疼痛的阈值提高,患者主观体验到的疼痛感减弱。此外,甲苯磺酸瑞马唑仑的代谢产物对中枢神经系统几乎没有活性,减少了对神经系统的持久影响,这在术后早期恢复中至关重要。

综上所述,瑞马唑仑在老年患者行前列腺电切术中的应用,相较于丙泊酚,能够缩短麻醉诱导及恢复时间,显著改善术后认知功能和减轻疼痛感,同时两者的不良反应发生率无显著差异,提示瑞马唑仑可能是更优的麻醉选择。

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