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术中升温毯联合等体温灌洗液在输尿管软镜 钬激光碎石术患者的应用效果

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[摘要] 目的: 探讨术中升温毯联合等体温灌洗液在输尿管软镜钬激光碎石术患者的应用效果。方法: 选取2021年1月至2021年10月阜阳市第二人民医院收治的94例输尿管软镜钬激光碎石术患者, 按照随机数表法分成对照组与研究组, 每组各47例。对照组给予常规手术室干预, 研究组术中另给予升温毯联合等体温灌洗液进行保温干预。记录两组一般资料和手术基本情况, 重点比较两组麻醉后(T0)、术中30 min(T1)和术毕(T2)的体温、心率(heart rate, HR)和平均动脉压(mean arterial pressure, MAP)变化, 并记录两组围手术期低体温、寒战和躁动发生情况。结果: 与本组T0时点比较, 两组T1~T2的体温均明显下降, HR、MAP明显升高($P < 0.05$), 研究组T1~T2的体温高于对照组, HR、MAP低于对照组($P < 0.05$)。两组围手术期寒战、躁动发生率比较差异无统计学意义($P > 0.05$), 研究组低体温发生率为10.64%, 总发生率为14.89%, 均明显低于对照组的29.79%、40.43%($P < 0.05$)。结论: 输尿管软镜钬激光碎石术中使用升温毯联合等体温灌洗液干预, 有助于维持体温、HR和MAP稳定, 对减少围手术期低体温、寒战和躁动发生的效果显著。

[关键词] 输尿管软镜钬激光碎石术; 手术室护理; 升温毯; 等体温灌洗液; 低体温; 寒战; 躁动

Application effect of intraoperative warming blanket combined with isobody temperature lavage solution in patients undergoing ureteroscopic holmium laser lithotripsy

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Abstract **Objective:** To investigate the effect of intraoperative warming blanket combined with isothermal lavage fluid in patients undergoing ureteroscopic holmium laser lithotripsy. **Methods:** A total of 94 patients with ureteroscopic holmium laser lithotripsy treated in Anhui Fuyang Second People's Hospital from January 2021 to October 2021 were selected and randomly divided into a control group and a study group, 47 cases in each group by random number table method. The control group was given routine operating room intervention, and the study group was given warming blanket combined with isothermal lavage fluid for thermal insulation intervention. The general data

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and basic operation conditions of the two groups were recorded, focusing on the changes in body temperature, heart rate (HR) and mean arterial pressure (MAP) after anesthesia (T0), 30 minutes during operation (T1) and after operation (T2). The occurrence of perioperative hypothermia, chills and agitation in the two groups were recorded. **Results:** Compared with t0 time point of this group, the body temperature of T1-T2 in the two groups decreased significantly, and the HR and map increased significantly ($P<0.05$). The body temperature of T1-T2 in the study group was higher than that in the control group, and the HR and map were lower than those in the control group ($P<0.05$). There was no significant difference in the incidence of perioperative shivering and agitation between the two groups ($P>0.05$). The incidence of hypothermia in the study group was 10.64% and the total incidence was 14.89%, which were significantly lower than 29.79% and 40.43% in the control group ($P<0.05$). **Conclusion:** The intervention of warming blanket combined with other body temperature lavage fluid in ureteroscopic holmium laser lithotripsy is helpful to maintain the stability of body temperature, HR and map, and has a significant effect on reducing the occurrence of perioperative hypothermia, chills and agitation.

Keywords ureteroscopic holmium laser lithotripsy; operating room nursing; heating blanket; isobody temperature lavage solution; hypothermia; shiver; restlessness

输尿管软镜钬激光碎石术经尿道逆行进入输尿管和肾盂、肾盏,具有微创、清除结石效果好和术后恢复快等优势,易被患者所接受,目前已成为输尿管结石和肾结石的首选术式。近些年随着输尿管软镜钬激光碎石术的广泛开展,手术护理经验的不断积累,发现患者术中低体温现象尤为突出^[1],需引起警惕和重视。低体温可引起围手术期生命体征明显变化,易诱发寒战、躁动等不良反应,一定程度增加手术风险,尤其是手术时间相对较长、体质相对较差的老年人或小儿,因此术中需密切监测患者体温变化,并制订相关的保温措施以减少低体温发生,对患者手术顺利进行和麻醉复苏有积极作用^[2-3]。目前手术室护理对体温监测和护理干预的重视程度有待提高,已有常规保温措施的干预效果也欠缺满意,无法满足日益增长的护理服务需求。本科室集思广益,自主制订了升温毯联合等体温灌洗液的保温干预措施,为进一步明确其应用效果,本研究对94例输尿管软镜钬激光碎石术患者进行随机分组对照试验,现报告如下。

1 对象与方法

1.1 对象

输尿管软镜钬激光碎石术患者纳入标准: 1)影像学确诊上尿路结石,且经医患沟通后,患者自愿选择输尿管软镜钬激光碎石术治疗; 2)年龄22~69岁,精神意识良好,对本研究知情且同意。排除标准: 1)美国麻醉医师协会分级 \geq III级; 2)术前合并严重感染性疾病、凝血功能障碍、心肾

肺等脏器功能不全者; 3)无法有效交流或拒绝参与本研究者。选取2021年1月至2021年10月在安徽省阜阳市第二人民医院住院的94例输尿管软镜钬激光碎石术患者,依据随机数表法分成对照组和研究组,两组各47例。本研究得到阜阳市第二人民医院医学伦理委员会批准。

1.2 方法

患者术前均完善B超或CT检查,明确结石大小及位置等信息,给予必要健康宣教。手术由同组泌尿外科医师和麻醉医师协同完成,麻醉方式为全身麻醉,手术方式均为输尿管软镜钬激光碎石术,术中所用灌洗液均为无菌生理盐水,灌洗液流量约4 000 mL/h。1)对照组给予常规手术室后干预,内容包括调节室内温度维持在24℃,湿度50%~60%,术中所需的输注液体采用Hotlime液体加热器预处理后输注,输注温度为接近人体的37℃。术中用普通棉毯进行常规保温,遮挡非手术部位进行保温,同时术中护士加强巡护,尽量减少非手术部位的暴露时间等。2)研究组在对照组常规手术室护理基础上,另给予升温毯联合等体温灌洗液进行保温。升温毯:患者入室麻醉至术毕过程中使用,将升温毯(天津海明医疗用品有限公司;SWTH-A医用升温毯)作为手术衣,覆盖患者上半身和下肢进行保温,充气温度设定为 (43 ± 1.5) ℃,风速调节为快速档,升温毯温度维持36~38℃。等体温灌洗液:推注灌洗液前先用加温箱将其加温至与人体体温相接近的37℃。两组送至麻醉恢复室后均给予相同病情监护。

1.3 观察指标

记录两组性别、年龄、结石类型、结石大小、肾积水、手术时间、住院时间等情况。记录麻醉后(T0)、术中30 min(T1)和术毕(T3)的体温、心率(heart rate, HR)、平均动脉压(mean arterial pressure, MAP), 其中体温为插件式肛温探头所测得的中心体温。记录围手术期低体温、寒战和躁动发生情况, 其中低体温为体温 $<36\text{ }^{\circ}\text{C}$ ^[4]。总发生率=(发生上述不良反应的例数/N) $\times 100\%$, 1例患者可出现1种或 ≥ 2 种不良反应。

1.4 统计学处理

SPSS 21.0软件处理数据, 计数资料以例(%)表示, 两组比较行 χ^2 或Fisher精确概率法检验; 计量资料经检验均满足正态分布和方差齐性, 可用均数 \pm 标准差($\bar{x}\pm s$)表示, 组内不同时点比较采用方差分析, 两组比较行 t 检验。 $P<0.05$ 为差异有统计学意义。

2 结果

2.1 两组一般资料和手术情况比较

两组一般资料和手术相关指标比较, 差异无统计学意义($P>0.05$, 表1)。

2.2 两组不同时点体温、HR、MAP监测比较

两组T0时体温、HR、MAP比较差异无统计学意义($P>0.05$)。与本组T0时点比较, 两组T1~T2的体温明显下降, HR、MAP明显升高($P<0.05$)。研究组T1~T2时点体温高于对照组, HR、MAP低于对照组($P<0.05$, 表2)。

2.3 两组围手术期低体温、寒战和躁动发生率比较

两组围手术期寒战、躁动发生率比较差异无统计学意义($P>0.05$), 研究组围手术期低体温和总发生率均低于对照组($P<0.05$, 表3)。

表1 两组一般资料和手术情况比较($n=47$)

Table 1 Comparison of general data and operation between the two groups ($n=47$)

组别	性别 (男/女)/例	年龄/岁	结石部位(输 尿管/肾)/例	结石直径/cm	合并肾积水/ [例(%)]	手术时间/min	住院时间/min
对照组	34/13	46.36 \pm 7.83	23/24	1.65 \pm 0.43	9 (19.15)	57.39 \pm 12.57	6.30 \pm 0.83
研究组	36/11	49.27 \pm 8.02	20/27	1.67 \pm 0.45	11 (23.40)	58.01 \pm 11.84	6.28 \pm 0.87
χ^2/t	0.224	1.599	0.386	0.220	0.254	0.246	0.114
P	0.636	0.113	0.835	0.826	0.614	0.806	0.910

表2 两组不同时点体温、HR、MAP监测比较($n=47$)

Table 2 Comparison of temperature, HR, and MAP between the two groups at different time points ($n=47$)

组别	体温/ $^{\circ}\text{C}$	HR/ min^{-1}	MAP/mmHg
对照组			
T0	36.73 \pm 0.26	77.24 \pm 9.30	87.92 \pm 6.13
T1	36.15 \pm 0.22*	85.90 \pm 9.61*	97.70 \pm 9.84*
T2	35.87 \pm 0.31*	90.76 \pm 10.28*	101.56 \pm 10.02*
F	13.257	15.028	16.714
P	<0.001	<0.001	<0.001
研究组			
T0	36.72 \pm 0.28	77.16 \pm 9.42	87.87 \pm 7.02
T1	36.40 \pm 0.25*	81.35 \pm 9.63*	92.72 \pm 8.63*
T2	36.38 \pm 0.29* [#]	83.06 \pm 9.79* [#]	95.29 \pm 8.47* [#]
F	9.306	8.429	11.316
P	0.018	0.023	<0.001

1 mmHg=0.133 kPa。与本组T0时点比较, * $P<0.05$; 与对照组比较, [#] $P<0.05$ 。

1 mmHg=0.133 kPa. Compared with T0 time point in this group, * $P<0.05$; Compared with the control group, [#] $P<0.05$.

表3 两组围手术期低体温、寒战和躁动发生率比较($n=47$)Table 3 Comparison of perioperative hypothermia, shivering and agitation between the two groups ($n=47$)

组别	低体温/[例(%)]	寒战/[例(%)]	躁动/[例(%)]	合计/[例(%)]
对照组	14 (29.79)	7 (14.89)	3 (6.38)	19 (40.43)
研究组	5 (10.64)	2 (4.26)	1 (2.13)	7 (14.89)
χ^2	5.343	1.966	0.261	7.656
P	0.021	0.161	0.609	0.006

3 讨论

输尿管软镜钬激光碎石术患者术中易出现低体温现象,发生原因除患者自身因素(如年龄、个体体质、心理因素)、使用全麻药物和手术部位持续暴露外,主要与术中使用大量低于体温的灌洗液冲洗结石碎屑有关,室温下的灌洗液可明显加剧患者机体热量散失,起“冷稀释”的作用,且随手术时间延长,热量散失逐渐加重,导致低体温发生^[5]。全身麻醉术中体温可下降1~2℃,其中大量灌洗液是围手术期低体温发生的主要因素^[6]。术中低体温可造成机体氧耗增加和心血管供血增加,免疫调节功能受损,机体应激反应加重,引起HR、MAP升高,增加寒战、躁动发生风险。还有报道^[7]还指出术中低体温可能会增加胃肠开腹手术患者手术部位感染(surgical site infection, SSI)的概率。提示加强术中体温干预对手术顺利进行和降低围手术期相关不良反应风险尤为重要。

目前手术室护理对术中保温的措施主要为调节室内温度、输注液体预加热和术中棉毯遮挡覆盖,但保温效果欠佳。本研究在常规保温护理基础上,制订了升温毯联合等体温灌洗液的保温干预措施,取得满意干预效果。本研究显示:虽然两组T1~T2时点体温、HR、MAP均较T0时点出现明显波动,但研究组T1~T2时点体温高于对照组,HR、MAP明显低于对照组,与已有报道^[8-9]相符,表明升温毯联合等体温灌洗液能更好地保证、术中体温和微循环稳定。分析原因认为,升温毯采用智能充气加热装置,设定温度和调节风速后,吹出的暖风经导管持续输入升温毯,形成稳定的加热气流,再经升温毯的内层小孔流出,在患者被覆盖部位形成持续、稳定和热量分布均匀的暖流,而且升温毯还能减少术中躯体热量散失,起到加温和预防体温明显波动发生的作用。而常规棉毯覆盖是被动保温,保温效果不如升温毯^[10]。胡皓琳等^[11]报道应用充气式保温毯覆盖在乳腺癌手术患者

的双侧髂前上棘连线至双膝连线之间,发现能有效减少术中低体温发生和术中出血量。本研究在使用升温毯同时,将灌洗液加温至接近人体体温的37℃,有效避免灌洗液对脏器的冷刺激,显著削弱冷稀释效应,对机体代谢和微循环的影响较小,对维持体温稳定有益^[12-13]。

低体温是引起患者围手术期寒战和躁动的主要原因,寒战、躁动不利于患者麻醉复苏,尤其对于年老体弱或合并心血管疾病的患者,严重时可增加心血管不良事件风险。本研究显示:与对照组相比,研究组围手术期低体温和总发生率均明显较低,与已有报道^[14]结果相似,表明升温毯联合等体温灌洗液对减少围手术期发生低体温、寒战和躁动的效果明显。有报道^[15-16]还指出:术中有效的体温管理不仅能稳定生命体征,而且能加快麻醉药物的代谢排出,缩短麻醉药物对体温调节中枢的干扰时间,也有利于预防寒战和躁动发生。

综上所述,术中升温毯联合等体温灌洗液能有效维持输尿管软镜钬激光碎石术患者体温、HR和MAP稳定,提高手术安全性,对预防围手术期低体温、寒战和躁动发生有益。而且升温毯和等体温灌洗液均为操作简单、经济低廉和安全性好的术中保温措施,易推广,值得临床手术室护理积极应用。

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